

SAFE, CLEAN WATER PROGRAM

FEASIBILITY STUDY REPORT

Regional Program Projects Module

PROJECT NAME	Metro Orange Line a Water Infiltration and Quality Project
PROJECT LEAD(S)	Los Angeles County Metropolitan Transportation Authority
SCW WATERSHED AREA	Upper Los Angeles River
PRELIMINARY SCORE	77
TOTAL SCW FUNDING REQUESTED	\$ 34,515,458.00
YEAR 1 FUNDING REQUESTED	\$ 1,600,000.00

Submitted On: Thursday, October 15, 2020

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OVERVIEW

The objective of the Regional Infrastructure Program under the Safe, Clean Water (SCW) Program is to plan, build, and maintain multi-benefit watershed-based projects that improve water quality and increase water supply and/or enhance communities. A Feasibility Study is required before a project can be submitted for consideration and scoring for funding through the Los Angeles Region Safe, Clean Water (SCW) Program's Regional Infrastructure Program. Each Feasibility Study should provide enough information about a potential project to allow the Watershed Area Steering Committee members to make an informed decision for as to which projects should move forward for consideration for funding. The Minimum Feasibility Study Requirements for the Scoring and Consideration of Regional Infrastructure Program Projects is available at: https://portal.safecleanwaterla.org/projects-module/.

This document is based upon an output from the web-based tool called the 'SCW Regional Projects Module' (https://portal.safecleanwaterla.org/projects-module/). This output summarizes the information and data provided to Regional Projects Module, and also provides an initial estimate of project scoring per the SCW Infrastructure Program Project Scoring Criteria.

IMPORTANT: ALL SCORING ESTIMATES GENERATED BY THE PROJECTS MODULE ARE PRELIMINARY AND SUBJECT TO REVIEW AND REVISION BY THE SCORING COMMITTEE.

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1 GENERAL INFORMATION

This section provides general information on the project including location and project description.

1.1 Overview

The following table provides an overview of the project and the Project Developer(s):

Project Name:	Metro Orange Line a Water Infiltration and Quality Project
Project Description:	Implement BMPs to improve water quality, recharge groundwater & provide transportation community benefits to disadvantaged communities
SCW Watershed Area:	Upper Los Angeles River
Call for Projects year:	FY21-22
Total SCW Funding Requested:	\$ 34,515,458.00
Phase(s) this application is requesting SCW funding for:	Planning, Design, Construction, O & M
Project Weather Type:	Wet
Project Lead(s):	Los Angeles County Metropolitan Transportation Authority
Additional Project Collaborators:	Los Angeles Department of Water and Power
Additional Project Collaborators:	
Additional Project Collaborators:	
Anticipated IPPD:	Los Angeles County Metropolitan Transportation Authority
Is this a non-municipal project?	No
Primary Contact (if differs from submitter):	Melissa Levitt, Senior Environmental Specialist, LA Metro
Primary Contact Email (if differs from submitter):	LevittM@metro.net
Secondary Contact (if differs from submitter):	N/A
Secondary Contact Email (if differs from submitter):	N/A

1.2 Project Location

The following table summarizes the project location:

Latitude:	34.180319
Longitude:	-118.447016
Street Address:	6060 Van Nuys Blvd,
City:	Los Angeles
State:	CA
Zip Code:	91401
Municipality:	Los Angeles

Please see the following attachment(s) for a project location map.

Attachments for this Section		
Attachment Name	Description	
MOL_Figure1and2_ProjectLoc_DAC_edit.pdf	Figure 1 shows project location and related right-of-way. Figure 2 shows project proximity to DAC	

Will the project provide benefit to a Disadvantaged Community (DAC)?

Yes

If Yes, Distance to nearest DAC.

0

If Yes, Describe how the project will provide benefits to a DAC.

The Project proposes the implementation of infiltration BMPs to mitigate stormwater runoff. As shown in the Figure 2 in the uploaded location map attachment, a majority of the Project drainage area is designated as United States Census Bureau disadvantage communities (DACs). As defined by the California Public Utilities Commission, DACs are disproportionally impacted economically; are more likely to be exposed to environmental hazards, such as air and water pollution; and are more likely to experience health complications, such as asthma and heart disease (California Public Utilities Commission, 2019). The proposed Project will reduce environmental hazards to the community by reducing surface water pollution and will increase the wellbeing of the community by mitigating localized nuisance flooding. In addition, the Project is integrated with the LA Metro Orange Line (MOL) Bus Rapid Transit (BRT) Improvements Project that provides faster and reliable travel and increased ridership to disadvantaged communities, enhances pedestrian safety, and supports the transition to electric bus operation and hence reduces greenhouse gas and air pollutants emissions.

If Yes, Describe how the project will provide water quality benefits to a DAC.

As the Project proposes a series of distributed stormwater BMPs, runoff from frequently recurring storms will be captured and infiltrated, thus minimizing untreated discharge to downstream surface water features.

If Yes, Describe how the project will provide water supply benefits to a DAC.

The Project also helps to recharge the local groundwater aquifer. Historic over-drafting has depleted this SCW Feasibility Study Report Page 5 of 44

resource, and by promoting recharge, there will be less reliance on imported water.

If Yes, Describe how the project will provide community investment benefits to a DAC.

LA Metro will provide approximately \$394M in transportation community investments in upgrades to the MOL which will increase bus speeds by 29%, increase ridership by 39%, and improve safety. The electrification of the MOL will eliminate tailpipe emissions of GHGs and criteria air pollutants. The addition of the drywell network to the project will also provide mitigation of localized nuisance flooding resulting from frequently recurring storm events. Additionally, the Project will use a plant palette of California native and locally-adapted drought tolerant vegetation in all landscaping. A detailed plant palette that will be used for the MOL project is uploaded under "Other Feasibility Information" section in this application.

If Yes, Describe how the project engaged the benefitting DAC(s) to date.

Several community outreach events have been completed for the MOL BRT Improvements Project in the neighborhood that will benefit from the proposed Project. Two community open house meetings were held on March 26 and 27, 2019. The Project was presented at the San Fernando Valley Service Council Meeting on April 3, 2019. Additionally, pop-up events showcasing the Project were set up at MOL stations throughout 2019.

Does this project comply with the anti-displacement policies of the Feasibility Study Requirements?

Yes

If Yes, Describe how anti-displacement policies were considered.

As shown in the uploaded location map (Figure 1a through 1g in the upload location maps), a majority of the Project is located within LA Metro owned parcels or right-of-way, and the remaining Project footprint is located within City of Los Angeles Right-of-Way. No impact to residential structures is anticipated. For the construction phase, the Project will lean on experience engaging with small, local contractors to employ a local workforce.

1.3 Project Description

Attachments for this Section			
Attachment Name	Description		
MOL_Factsheet_(2020-10-15).pdf	Project factsheet		

Which regional water management plan includes the proposed project (SWRP, E/WMP, IRWMP, or other [must identify and justify as equivalent per 18.07.B.1.c.3]):

The proposed Project is located within the Upper Los Angeles River (ULAR) Watershed. LA Metro has initiated discussion with the ULAR Watershed Management Group (WMG) and has presented the Project concept at the ULAR WMG September monthly meeting, and has demonstrated the proposed Project can achieve the performance target from its drainage area. Detailed discussion on the Project performance can be found under the "Water Quality" section of the application. LA Metro will continue working with the ULAR WMG to incorporate the Project into the ULAR Enhanced Watershed Management Program (EWMP).

Provide a detailed description and historical background of the project. Please also state which regional water management plan includes the proposed project (SWRP, E/WMP, IRWMP, or other [must identify and justify as equivalent per 18.07.B.1.c.3]):

The Metro Orange Line (MOL) is an 18-mile Bus Rail Transit (BRT) line that serves the San Fernando Valley from the North Hollywood Red Line station to Chatsworth. Originally opened in 2005 and expanded in 2012, MOL is one of the two LA Metro bus routes that has dedicated lanes on freeways and streets. It is also considered one the busiest BRT lines in the nation with an average of 30,000 passengers every weekday.

In January 2016 the LA Metro Board of Directors (Board) authorized a technical study to assess various improvements to the MOL. In 2017 the Board authorized the MOL BRT Improvements Project, which will improve operating speeds, increase ridership, support the transition to an all-electric bus service, and improve safety, by providing a grade separation structure between Van Nuys to Sepulveda Boulevards, four-quadrant safety gates at at-grade intersections between North Hollywood and Chatsworth Stations, and other improvements. The MOL BRT Improvements Project is expected to be completed by 2025. Also in 2017, the Board voted to transition to an all-electric bus fleet by 2030. MOL will be one of the first LA Metro routes that will transition to all-electric service by end of 2021.

Recognizing the significant groundwater infiltration and stormwater quality capture potential in the San Fernando Valley, in March 2020, the LA Metro Environmental Compliance & Sustainability Department (ECSD) initiated a feasibility evaluation of LA Metro properties in the area. LA Metro is currently moving forward with the proposed Metro Orange Line Water Infiltration and Quality Project (Project), which will be integrated into and is planned to be constructed as an element of the MOL BRT Improvements Project.

The Project proposes to divert stormwater runoff from existing regional storm drains and from the surface to a network of 168 infiltration drywells across seven locations within Metro properties along the MOL, with pretreatment facilities to capture, treat, and infiltrate stormwater runoff from 2,300 acres, resulting in an estimated groundwater recharge of 890 acre-feet/year into the San Fernando Groundwater Basin. Detailed analysis supporting the groundwater recharge estimate can be in the "Water Supply" section of this application. LA Metro's extensive land holdings and fortuitous siting within the highest value groundwater recharge areas in the region would allow for large-scale infiltration and aquifer recharge. In 2019, LA Metro's total water consumption was 772 acre-feet. The Project has the potential to capture enough stormwater to allow Metro to become net water positive, contributing more water to regional groundwater recharge than it uses to support all of its operations.

The primary objective of the proposed Project is to recharge treated stormwater into the San Fernando Groundwater Basin. Secondary objectives of the proposed Project include improving surface water quality at downstream receiving water (Los Angeles River) and reducing risk of localized flooding by mitigating peak flow

rates.

2 DESIGN ELEMENTS

This section provides an overview of the project design details.

2.1 Configuration

The following table is a summary of the project configuration:

Project Configuration Summary		
BMP Type:	Infiltration Well	
Infiltration Footprint Area:	0.125 ac	
Ponding Depth:	45 ft	
Media Layer Depth:	0 ft	
Media Layer Porosity:	0 ft	
Underdrain Layer Depth:	0 ft	
Underdrain Layer Porosity:	0 ft	

Calculated Storage Volume		
Module-generated Storage Volume:	5.6250 ac-ft	

Please upload a description and detailed schematic of the project layout including its anticipated footprint and key components such as, but not limited to: inlets, outlets, diversion point, recreational components, nature-based components, pumps, treatment facilities, underdrains, conveyance, above ground improvements, and other project components.

Attachments for this Section		
Attachment Name	Description	
MOL_ProjectConfiguration_edit_reduced.pdf	Conceptual drawing of the proposed Project	

2.2 Capture Area

The size and land uses of the capture area upstream of a project plays an important role in its water quality and water supply benefits. The capture area information here is used by the Module for scoring:

Capture Area Summary		
Capture Area:	2319 ac	
Impervious Area:	1473 ac	
Pervious Area:	846 ac	

The following table is a summary of the land use breakdown for the area that drains to the project:

Breakdown of Impervious Acreage in Capture Area		
Land Use Type	Percent Impervious	Acres
Single Family Residential	10.1 %	148.77
Commercial	8.3 %	122.26

Institutional	51.9 %	764.49
Multi Family Residential	5.6 %	82.49
Secondary Roads and Alleys	19.5 %	287.24
Industrial	3.7 %	54.5
Urban Open Space	0.9 %	13.26

The following table is a breakdown of the municipal jurisdictional areas within the project capture area:

Breakdown of the Municipal Jurisdictional Areas within the Project Capture Area		
Municipal	Tributary Percent	Acres
Los Angeles	100 %	2319

Attachments for this Section	
Attachment Name	Description
MOL_CaptureAreaMap_final.pdf	Map showing project drainage area, landuse and municipal boundary. It also includes a description on how the drainage area is delineated

Has a shapefile of the project capture area has been uploaded to the project? Yes

2.3 Diversion

Diversion Structures generally apply to 'off-line' regional projects where stormwater is diverted from a major water conveyance (e.g., gravity main) and directed to the project at a predetermined maximum rate. Smaller distributed projects, like bioretention, do not normally utilize these devices.

Does the project have a diversion structure?

Yes

The following table provides details on the diversion type and maximum diversion rate:

Diversion Details	
Type of Diversion	Typical Max Diversion Rate (cfs)
Pumping	32 cfs

Estimated Average Inflow Captured by Project:

19 cfs

Description of Diversion:

Six of the seven proposed BMP clusters (MOL-1, -2, -3, -4, -5 and -7) include active diversion structures (pump stations) where stormwater runoff is diverted and pumped from the storm drain to the infiltration BMPs. The maximum diversion rates range between 10 to 32 cfs to match the maximum capacity of each infiltration BMP cluster. MOL-6 includes a gravity based diversion of stormwater runoff from surface street gutters along Woodman Ave.

When the maximum capacity of each infiltration BMP cluster is reached, the pump station will turn off, allowing stormwater to continue flowing in the storm drain. If a hazardous material spill were to occur upstream, the pump station will be shut down to prevent diverting the spill into the infiltration BMPs.

At a later design stage, the Project may replace the proposed pump stations with gravity driven diversions

pending further hydraulic gradient analysis. The maximum diversion rate and average inflow of the diversion structure will remain unchanged and an equivalent shutoff feature would also be included to prevent potential spills from entering the infiltration BMPs.

2.4 Site Conditions & Constraints

Please provide an upload for each of the attachments below that describes the methods, outcomes and how the information will be incorporated into the project design.:

Engineering analyses and estimates of existing Project site conditions were performed by reviewing geology maps, topographic data, soil boring logs and Cone Penetration Test (CPT) results collected on-site and nearby, utility mapping, existing condition drainage as-built drawings. Event-based and long-term continuous simulations were performed to characterize the existing hydrologic and water quality condition to assess Project performance. Potential groundwater contaminants were also reviewed by searching for active GeoTracker sites within 0.5 miles of all Project sites and by reviewing relevant EDR reports.

The BMP configuration was developed in accordance with existing drainage as-built, local drainage patterns, and utility mapping. All Project design elements are within LA Metro-owned parcels and public right-of-way (i.e., on and/or underneath the parcel or roadway). Minor alteration to existing storms within Metro right-of-way will be required to construct the BMPs. In addition, six of the BMP clusters require diverting from Los Angeles County-owned storm drains and require active pumping to overcome the hydraulic head and divert stormwater to the BMP clusters. The diversion pipe will cross existing sewer lines at MOL-4 and MOL-7. For these two locations the diversion pipes will be placed deeper than the sewer lines to avoid interference. No other utility conflicts are identified to date. The diversion point may also be adjusted pending additional surveying and potholing investigation during the design stage.

Based on review of available geotechnical data, geophysical constraints that prevent stormwater infiltration are either not present at the project site (e.g. landslide potential, slope instability, expansive soil, surcharge on adjacent structures) or can be mitigated (e.g. liquefaction). Based on review of geologic map, available boring logs and cone penetration test (CPT) results collected on or near the Project site, the infiltration wells at proposed Project sites are expected to perform well and achieve an 0.8 cfs infiltration rate per well on average.

Since the Project consists of seven BMP sites with independent drainage areas, the SCW online module's built-in modeling tool cannot be utilized. Instead, Los Angeles County's Watershed Management System 2.0 (WMMS 2.0) was used to characterize annual average runoff quantity and pollutant loading, assess project performance during a 24-hour, 85th percentile storm, and assess the long-term water quality and water supply benefits of the project over a 10-year continuous simulation between 10/1/2008 and 09/30/2018. According to the model output, the proposed Project is estimated to capture 91% runoff volume from a 24-hour, 85th percentile design storm, achieve 65% primary and secondary pollutant load reduction on an annual basis, and recharge 890 ac-feet of runoff into the San Fernando Groundwater Basin on an annual basis.

Based on review of the GeoTracker database and EDR report, there are active remediation efforts on volatile organic compounds and non-petroleum hydrocarbons within 0.5 miles of the proposed BMP sites. No significant contaminant plume was identified beneath the proposed BMP sites. Therefore, the risk of the proposed BMP introducing additional contaminants into the San Fernando Valley Groundwater Basin is low.

Detailed analysis methodology, assumptions, and results supporting the findings above can be found in the uploaded attachments below.

Does the project involve LACFCD infrastructure, facilities, or right-of-way?

Yes

Please see the following attachments for additional details on geotechnical, hydrology, right-of-way and/or LACFCD, and utility conditions.

Attachments for this Section	
Attachment Name	Description

MOL_Geotechnical_Review_Final_Reduced.pdf	Main geotechnical review report with figures
MOL_Geotech_Appendix A.pdf	Geotechnical Review Report Appendix A
MOL_Geotech_Appendix B.pdf	Geotechnical Review Report Appendix B
MOL_Geotech_Appendix C.pdf	Geotechnical Review Report Appendix C
MOL_Geotech_Appendix D.pdf	Geotechnical Review Report Appendix D
MOL_Geotech_Appendix E_Reduced.pdf	Geotechnical Review Report Appendix E
MOL_Geotech_Appendix F.pdf	Geotechnical Review Report Appendix F
MOL_Geotech_Appendix G.pdf	Geotechnical Review Report Appendix G
MOL_Geotech_Appendix H_Reduced.pdf	Geotechnical Review Report Appendix H

Attachments for this Section	
Attachment Name	Description
MOL_ExistingHydrology.pdf	Existing hydrology and water quality condition characterization

Attachments for this Section	
Attachment Name	Description
MOL_LACFCD_Confirmation.pdf	Email communication with LACFCD confirming a letter of conceptual approval is under preparation
GO.Metro Orange Line- Conceptual Approval1.pdf	Notice of Conceptual Approval from LACFCD

Attachments for this Section	
Attachment Name	Description
MOL_Utility Review_Final.pdf	Summary of utility review findings

2.5 Monitoring

This section provides an overview of monitoring data related to the project.

Has any monitoring data been compiled related to the project?

No

Please provide an overview of the monitoring performed to date:

N/A

Please upload a monitoring plan to measure the effectiveness of the proposed project once completed, including metrics specific to the identified benefits. Also attach supplemental information on monitoring conducted to date, if applicable.

Attachments for this Section	
Attachment Name	Description
MOL_Monitoring_Plan_Final_Compiled.pdf	Project monitoring plan

2.6 O & M

Provide an overview of the plan for how operations and maintenance of the Project will be carried out. Identify the responsible party and describe any technical expertise required for O&M.

O&M of the stormwater BMP is anticipated to begin June 2024. LA Metro will be responsible for the O&M. Project components that require O&M include drywells, pretreatment facilities, and diversion structures/pump stations. O&M activities and associated frequencies and cost are determined based on past experience with similar projects implemented by LA Metro's teaming partners (LADWP, Geosyntec Consultants), and on practical insights provided by drywell, pretreatment facility and pump vendors.

The O&M Plan provided below is commensurate with the Project's current level of detail.

Attachments for this Section	
Attachment Name	Description
MOL_O&M_Plan.pdf	Operation and maintenance plan for the proposed Project

3 WATER QUALITY BENEFITS

This section provides an overview of project elements related to water quality benefits, including calculations used for Section A (Water Quality Benefits) of SCW Project Scoring Criteria.

3.1 MS4 Compliance

Please describe in detail how the project will support achievement of compliance with MS4 Permit including applicable TMDLs, role with Watershed Management Program, etc. Please clearly specify if this project is being developed as part of a Time Schedule Order for the MS4 Permit. SCW funds may be used for projects implemented pursuant to a TSO issued by the LA Regional Water Quality Control Board provided that, at the time the TSO is issued, the project is included in an approved watershed management program developed pursuant to the MS4 Permit:

The proposed Project will support achievement of compliance with the MS4 Permit by contributing to the ULAR EWMP, including contributing to compliance with the following TMDLs:

- Los Angeles River Nutrients TMDL
- Los Angeles River Trash TMDL
- Los Angeles Metals TMDL
- Los Angeles River Bacteria TMDL

In reference to the ULAR EWMP implementation strategy, the proposed Project captures, treats and infiltrates stormwater runoff from the following ULAR EWMP jurisheds: 685949, 686149, 685049, 685649, 684449 and 683949. The annual pollutant target load reduction of these jurisheds range between 7% to 63%, and the cumulative 24-hour runoff management target for all referenced jurisheds is 106.5 acre-feet.

According to the WMMS 2.0 modeling output, the proposed Project can achieve over 65% pollutant load reduction on an annual basis and provide 268 acre-feet of 24-hour runoff management capacity. Therefore, the proposed Project has the potential to significantly contribute to meeting both pollutant target load reduction and 24-hour runoff management capacity targets within its drainage area.

Detailed information supporting the 24-hour stormwater management capacity and pollutant load reduction can be found in the supporting documentations uploaded in "Long-Term Performance" and "24-Hour Storm Capacity" sections below respectively.

The proposed Project was not developed as part of a Time Schedule Order for the MS4 Permit.

3.2 24-hour Storm Capacity

Please enter information below regarding key parameters of the project's capacity. The Module will use those values to estimate the 24-hour capacity:

24-hour Storm Capacity Breakdown	
Effective Draw Down Rate:	0 in/hr
Stormwater Use During 24-hr Design Event:	0 gal

Calculated 24-hour Storm Capacity		
Module-generated 24-hr Capacity:	5.6250 ac-ft	
Use Project Developer estimate instead?	Yes	
Custom Value specified by User:	268 ac-ft	
Please provide a description of methods used to calculate 24-hour capacity, and attach supplemental information with details of the methodology, assumptions and calculations.	The 24-hour capacity is computed as the sum of the static storage capacity provided by all drywells and the 24-hour cumulative infiltration volume through all drywells. Detail calculation is included in the attached PDF.	

Attachments for this Section	
Attachment Name	Description
MOL_24-Hour Capacity_Final.pdf	24-Hour Capacity calculation methodology and result

3.3 Event-based Design Details

n this section, details regarding the project inlets and outlets are provided, along with estimates generated for the project design event. The event-based information is envisioned as basic estimates that would be generated during the project design, and will support review of the project details.

Estimated Total Inflow Volume during Design Event:

142 ac-ft

Describe the event used for project design. Describe the portion of the peak inflow that would be retained by the project through infiltration, capture, diversion, use, or other means. Tooltip for 'Treatment Description' under outlets:

The 85th percentile, 24-hour storm is used as the design storm.

Describe whether and how the 85th percentile is being captured/diverted. If not, is there opportunity to do so? If feasible but not incorporated, explain why. If not feasible, explain why.

According to the event-based hydrologic simulation, the proposed Project, which consists of 168 drywells, can capture 91% of the runoff from the drainage area produced during the 85th-percentile 24-hour design storm. An additional 137 drywells will be needed to fully capture the runoff from the 85th-percentile 24-hour design storm. It is infeasible to accommodate the additional drywells within LA Metro-owned parcels and right-of-way and without interfering with the normal operation of the MOL BRT.

The following tables detail inflow and outflow from the project during the design event:

Inlets		
Estimated Max Inflow Rate (cfs)	Total Inflow (ac-ft)	
33 cfs	18 ac-ft	
81 cfs	44 ac-ft	
27 cfs	15 ac-ft	
67 cfs	37 ac-ft	
17 cfs	9 ac-ft	
8 cfs	4 ac-ft	
26 cfs	14 ac-ft	

Outlets			
Estimated Max Outflow Rate (cfs)	Treated?	Treatment Description	Percent of Volume Treated (%)
17 cfs	Yes	Infiltrated runoff by Drywell Cluster MOL-1 during the design storm	94 %
1 cfs	No	N/A	N/A
38 cfs	Yes	Infiltrated runoff by Drywell Cluster MOL-2 during the design storm	86 %
7 cfs	No	N/A	N/A
13 cfs	Yes	Infiltrated runoff by Drywell Cluster MOL-3 during the design storm	87 %
2 cfs	No	N/A	N/A

33 cfs	Yes	Infiltrated runoff by Drywell Cluster MOL-4 during the design storm	89 %
4 cfs	No	N/A	N/A
9 cfs	Yes	Infiltrated runoff by Drywell Cluster MOL-5 during the design storm	100 %
0 cfs	No	N/A	N/A
4 cfs	Yes	Infiltrated runoff by Drywell Cluster MOL-6 during the design storm	100 %
0 cfs	No	N/A	N/A
14 cfs	Yes	Infiltrated runoff by Drywell Cluster MOL-7 during the design storm	100 %
0 cfs	No	N/A	N/A

Describe the methods used to generate estimates:

Inflow and outflow volumes and peak flow rates were estimated using event-based hydrology and BMP routing simulation using WMMS 2.0. Detailed model methodology, assumptions, inputs and outputs can be found in the supporting documentation uploaded below. Location of inlet and outlet can be found in the conceptual drawing uploaded in the "Design Elements – Configuration" section of the application.

Attachments for this Section		
Attachment Name Description		
MOL_EventBasedHydrologicModeling.pdf	Supporting documentation for the even- based hydrologic modeling	

3.4 Long-term Performance

This section present details of the calculation of long term (10-year) water quality benefit for Section A.1.2 (Water Quality Benefit) of SCW Project Scoring Criteria. These estimates were either generated by the Module using a 10-year hourly simulation with the Watershed Management Modeling System (WMMS), or generated by the Project Developer.

The following tables present selected primary and secondary pollutants and calculated reductions for water quality benefit per Section A.1.2 (Water Quality Benefit) of SCW Project Scoring Criteria.

Note: these estimates are based on the hourly 10-year WMMS simulation performed by the Module, or as estimated by the Project Developer.

Primary Pollutant		
Primary Pollutant	Total Zinc	
Reduction Method used for Scoring	Method 2 (% Load Reduction)	
Justification for selecting Primary Pollutant	Limiting pollutant identified in the ULAR EWMP	
Calculated 10-year Pollutant Reduction	97.9	
Use Project Developer estimate instead?	Yes	
Own Value	65 %	
Justification for using own value	Limiting pollutant identified in the ULAR EWMP	
Secondary Pollutant		
Secondary Pollutant	Bacteria	
Reduction Method used for Scoring	Method 2 (% Load Reduction)	
Justification for selecting Secondary Pollutant	Limiting pollutant identified in the ULAR EWMP	
Calculated 10-year Pollutant Reduction	70.9	
Use Project Developer estimate instead?	Yes	
Own Value	65 %	
Justification for using own value	Limiting pollutant identified in the ULAR EWMP. Please refer to the PDF uploaded under "Primary Pollutant" for supporting documentation	

The following table presents calculated water quality benefit achieved by the project based on the hourly 10-year WMMS simulation performed by the Module, for all the simulated pollutants.

Note: this output includes all pollutants and methods, including those not selected as Primary or Secondary for scoring.

Pollutant Name	Method 1 (% Concentration Reduction)	Method 2 (% Load Reduction)	Method 3 (% Exceedance Reduction)
Total Zinc	6.8 %	6.9 %	N/A
Total Copper	6.5 %	6.6 %	N/A
Total Lead	4.4 %	4.5 %	N/A
Total Nitrogen	15.6 %	15.7 %	N/A
Total Phosphorous	12.2 %	12.3 %	N/A
E.coli	5.3 %	5.4 %	N/A
Toxics	N/A	N/A	N/A
Chloride	N/A	N/A	N/A
Trash	N/A	N/A	N/A
Toxics Chloride Trash	N/A	N/A	N/A N/A

N/A = Modeling results not available from Projects Module, must be manually generated by user

The following table presents inflow and outflow details for calculated water quality benefit achieved by the project based on the hourly 10-year WMMS simulation performed by the Module, for all the simulated pollutants.

Note: this output includes pollutants not selected as Primary or Secondary for scoring, and reduction methods not selected for scoring.

Metric	Runoff from Capture Area	Minimally Treated Outflow from Project	Inflow into Project Inlet	Outflow from Project Outlet	Reduction by Project	% Reduction by Project
Runoff Volume (ac-ft)	1179.471	816.036	816.602	816.036	0.565	0.069 %
Total Zinc (ug/L)	298.580	260.350	279.380	260.350	19.030	6.812 %
Total Zinc (lbs)	957.664	577.736	620.411	577.736	42.675	6.879 %
Total Copper (ug/L)	65.830	58.000	62.030	58.000	4.030	6.497 %
Total Copper (lbs)	211.139	128.717	137.744	128.717	9.027	6.554 %
Total Lead (ug/L)	45.390	40.130	41.980	40.130	1.850	4.407 %
Total Lead (lbs)	145.584	89.053	93.217	89.053	4.164	4.467 %
Total Nitrogen (mg/L)	3.478	2.994	3.548	2.994	0.554	15.617 %
Total Nitrogen (lbs)	11153.808	6644.543	7879.730	6644.543	1235.187	15.675 %
Total Phosphorous (mg/L)	0.527	0.464	0.529	0.464	0.065	12.206 %
Total Phosphorous (lbs)	1690.565	1030.023	1174.034	1030.023	144.011	12.266 %
E.coli (#/100mL)	6.655E+004	6.108E+004	6.450E+004	6.108E+004	3.421E+003	5.304 %
E.coli (#)	9.681E+014	6.147E+014	6.496E+014	6.147E+014	3.488E+013	5.370 %
Toxics	N/A	N/A	N/A	N/A	N/A	N/A
Chloride	N/A	N/A	N/A	N/A	N/A	N/A
Trash	N/A	N/A	N/A	N/A	N/A	N/A
N/A Modeling user	results not av	ailable from F	Projects Modu	lle, must be m	nanually gene	erated by

Attachments for this Section		
Attachment Name	Description	
MOL_LongTermHydrologicModeling.pdf	Supporting documentation for the long-term hydrologic modeling	

4 WATER SUPPLY BENEFITS

This section provides an overview of project elements related to water supply benefits, including calculations used for Section B (Significant Water Supply Benefits) of SCW Project Scoring Criteria.

4.1 Water Supply Nexus

Please describe and clearly justify the nexus between water supply and the stormwater and/or urban runoff that is captured/infiltrated/diverted by the Project:

The benefit claimed will result from increasing water supply as infiltrated water reaches the San Fernando Valley Basin groundwater aquifer. The project does not directly offset potable demand.

Does this project capture water for onsite irrigation use?

No

Description of onsite use by the project:

N/A

Does this project capture water used for water recycling by a wastewater treatment facility?

No

Description of water recycling by the project:

N/A

Is the project connected to a managed water supply aquifer?

Yes

If Yes, managed Aquifer Name:

San Fernando Valley Groundwater Basin

If this project is augmenting groundwater supply, please provide confirmation that the agency managing the groundwater basin concurs with the added benefit.

Attachments for this Section		
Attachment Name	Description	
scanner@ladwp.com_20201015_142907.pdf	Letter of acknowledgement from LADWP. In addition, LA Metro has also initiated discussion with ULARA Watermaster for conceptual approval.	
LID Review Letter - Metro Orange Line Project.pdf	LID Review letter from ULARA Watermaster confirming no objection to the proposed project	

4.2 Benefit Magnitude

Project Scoring Criteria Section B is based upon estimates of annual average water supply benefit. Water supply benefit can include, but is not limited to, water diverted to a separate groundwater recharge facility, into a water treatment plant, to a sanitary sewer to be converted into recycled water, etc. This section provides documentation of estimates of annual average water supply benefit.

Average dry weather inflow to project:

0.1 cfs

Describe the methods used to estimate average dry weather inflow to the project:

The annual average recharge volume and inflow rate were estimated based on the continuous hydrologic and BMP routing simulation using WMMS 2.0. Detailed model methodology, assumptions, inputs and outputs can be found in the supporting documentation for the long-term hydrologic modeling (Uploaded under "Water Quality - > Long-Term Performance" section of this application)

The following tables present calculated annual inflow the project.

Note these estimates are based on an hourly 20-year hourly WMMS simulation performed by the Module, or as estimated by the Project Developer.

Module-generated annual average inflow to project:	816.602 ac-ft
Use Project Developer estimate instead?	Yes
Custom Value specified by User:	1350 ac-ft

Please provide a description of methods used to calculate water supply inflow values	The Project's annual average inflow/capture volume is computed as the sum of the average annual runoff captured by all BMP sites. The estimate is based on the modeling output using a continuous hydrology and BMP routing simulation using WMMS 2.0. Detailed model methodology, assumptions, inputs and outputs can be found in the supporting documentation for the long-term hydrologic modeling (Uploaded under "Water Quality - Long-Term Performance" section of this application)
Supporting PDF	applicable.

The following tables present calculated annual average capture by the project, which is used for the Section B2 scoring calculation (Benefit Magnitude of SCW Scoring Criteria).

Note these estimates are based on an hourly 20-year hourly WMMS simulation performed by the Module, or as estimated by the Project Developer.

Module-generated annual average <u>capture</u> for water supply:	0.565 ac-ft
Use Project Developer estimate instead?	Yes
Custom Value specified by User:	890 ac-ft

Please provide a description of methods used to calculate water supply benefit	The Project's annual average inflow/capture volume is computed as the sum of the average annual runoff captured by all BMP sites. The estimate is based on the modeling output using a continuous hydrology and BMP routing simulation using WMMS 2.0. Detailed model methodology, assumptions, inputs and outputs can be found in the supporting documentation for the long-term hydrologic modeling (Uploaded under "Water Quality -> Long-Term Performance" section of this application)
Supporting PDF	See attached PDF if applicable.

4.3 Cost Effectiveness

Project Scoring Criteria Section B2 incorporates life-cycle costs. The cost-effectiveness for water supply benefit is calculated from other sections in the Module. The calculation for B2 scoring is based on a numerator of life-cycle cost (from Design Elements > Cost) and a denominator of annual average benefit magnitude (from Water Supply > Benefit Magnitude).

Module-generated water supply cost-effectiveness:	\$ 2,742.28 per ac-ft
Use Project Developer estimate instead?	Yes
Custom Value specified by User:	\$ 2219 ac-ft

Justification	We propose to consider the additional benefit on the secured cost-share we have brought into the project in assessing the project's cost effectiveness and computing the cost effectiveness based on the life cycle cost that is calculated by excluding the committed cost share. Additional information on the estimated value is uploaded below.
Supporting PDF	See attached PDF if applicable.

Attachments for this Section		
Attachment Name Description		
MOL_CostEstimate&CostEffectiveness.pdf	Supporting documentation on the cost effectiveness calculation	

5 COMMUNITY INVESTMENT & LOCAL SUPPORT BENEFITS

5.1 Community Investment

This section provides an overview of project elements related to community investment benefits, which are used in calculations for Section C (Community Investment Benefits) of SCW Project Scoring Criteria.

The following table details the project's community investment benefits:

Community Investment		
Investment Type	Applicable?	Detailed Description
Does this project improve flood management, flood conveyance, or flood risk mitigation?	Yes	The Project proposes to divert a significant portion of stormwater runoff from six regional storm drains and from a major road intersection that has local flooding issues (Woodman Ave.). The proposed Project can help reduce overall peak flows and the risk of potential localized flooding, and restores capacity to the drainage system downstream. Additional documentation supporting the Project's flood risk mitigation benefit is uploaded below.
Does this project create, enhance, or restore park space, habitat, or wetland space?	No	N/A
Does this project improve public access to waterways?	Yes	The Project is part of the MOL BRT Improvements Project, which provides an improved, safer pedestrian and bike path, increased bus speeds, and improved ridership and capacity that will provide multi-modal access for local communities in San Fernando Valley to Los Angeles River and other waterways in Los Angeles County. Additional information on the project' impact on improving public access to waterways is included in the community open house meeting presentation below.
Does this project create or enhance new recreational opportunities?	Yes	The Project is part of the MOL BRT Improvements, which includes grade separation and gating throughout the Metro Orange Line to enhance the safety of bicyclists and pedestrians who utilize the Orange Line bike path for recreational uses. Additional information on the project' impact on improving public access to waterways is included in the community open house meeting presentation below.
Does this project create or enhance green spaces at school?	No	N/A
Does this project reduce heat local island effect and increase shade?	No	N/A

Does this project increase shade or			
the number of trees or other	No	N/A	
vegetation at the site location?			

5.2 Local Support

Please describe any prior outreach and engagement conducted for this project:

The MOL BRT Improvements Project held a series of project kick-off open houses in late November and early December 2017, which served as the first round of public involvement. In March 2018, in partnership with the San Fernando Valley Council of Governments, Metro hosted a half-day tour of the Metro Expo Line for approximately 30 elected and city staff, as well as local transit advocates. In June 2018, Metro held community open houses in Van Nuys and North Hollywood to provide stakeholders with an update on Metro projects in the San Fernando Valley. Two community open house meetings were held on March 26 and 27, 2019 in Canoga Park and North Hollywood to present an update on the project, including details on the pilot gate, grade separations, and traffic/noise analysis. The Project was presented at the San Fernando Valley Service Council Meeting on April 3, 2019. Additionally, pop-up events showcasing the Project were set up at MOL stations throughout 2019.

In 2020 LA Metro engaged several key stakeholders in the development of the MOL Water Infiltration and Quality Project. This included targeted discussions with agencies such as LADWP, LA Sanitation, and StreetsLA and community organizations, such as Climate Resolve, Council for Watershed Health, and the NRDC.

Please describe the Outreach Plan for this project moving forward:

Additional community outreach events will be held during the Project planning and design phases to increase Project awareness within the local community and provide opportunities for input. Educational information and signage will be developed to educate the public on the infiltration system and water supply and quality benefits provided to the community.

Does this demonstrate strong local, community-based support?

Yes

The following table details the support by local, community-based organizations for the project (also see attachments):

	Local Support	
Organization Name	Description	PDF

Climate Resolve, Council for Watershed Health	The project has a high level of interest and support from the local communities, City and County of Los Angeles, and local non-government organizations. Two letters of support from NGOs (Climate Resolve, Council for Watershed Health) are provided in support of this application. Additional community meeting contents and minutes for the prior outreach described above are also included in support of this application. The Project generated a high level of interest from local community supports because it promotes safer and more reliable traveling using MOL, MOL bike paths and MOL pedestrian paths, and supports the transition to fully electrifying the MOL bus fleet with zero emission electric buses.	MOL_LetterOfSupport_Final_Reduced.pdf
Natural Resources Defense Council (NRDC)	Support Letter from NRDC	NRDC MOL letter of support.pdf

6 NATURE-BASED SOLUTIONS

This section provides an overview of project elements that leverage nature-based solutions, which are used in calculations for Section D (Nature-Based Solutions) of SCW Project Scoring Criteria.

Does this project implement natural processes?

Yes

Natural Processes Description:

Prior to development, stormwater would infiltrate into the ground as it flowed across permeable surfaces. In general, the typical response at a given watershed outfall is a slow, shallow curve.

In the existing post-development condition, stormwater flows across impermeable surfaces until it is collected into "grey" stormwater infrastructure (i.e. storm drains) and transported to an outfall – in this case, the Los Angeles River, which is also largely impervious. The flow at a given watershed outfall therefore responds to precipitation in a fast and sharp curve. This increase of impervious surface results in localized flooding, as well as losing the benefit of groundwater recharge.

In the proposed Project, stormwater will be infiltrated as it is collected in drywells. The precipitation-runoff response curve will be a corrected toward the natural, pre-development condition.

Does this project utilize natural materials?

Yes

Natural Materials Description:

The infiltration BMPs use natural material such as gravels for natural filtration of the captured stormwater. In addition, landscape areas that are disturbed by the construction of the MOL BRT Improvement Project will be restored with California native, drought-tolerant shrubs and trees such as Blue Palo Verde, California Walnut, Coast Live Oak, Mexican Palo Verde, Valley Oak, Western Cottonwood and Western Sycamore.

Description of how nature-based solutions are utilized to the maximum extent feasible. If nature-based solutions are not used, include a description of what options where considered and why they were not included.

Drywells use the natural process of infiltration to shift the area's precipitation-runoff response curve closer to the natural, pre-development condition.

Drywells allow for small pockets of very high infiltration, enabling the area to mimic a natural stormwater response in a space-effective way without needing to remove large amounts of existing impervious surface. Drywells were also sited to not overlap with other existing or proposed infiltration projects. As a result, the extent of the Project is unique and intentional, as it provides geographic connectivity with the tributary watershed areas for those other projects.

The following table details the impermeable area removed by the project:

Removed Impermeable Area by Project		
Pre-Project Impervious Area: Post-Project Impervious Area:		
1473 ac	1473 ac	

7 COST & SCHEDULE

This section provides an overview of the project's funding and community support, which are used in calculations for Section E (Leverage Funds and Community Support) of SCW Project Scoring Criteria.

7.1 Cost & Schedule

The following tables provide details on the project's phase and annualized costs:

Phase Costs			
Phase	Description	Cost	Completion Date
Planning	Planning includes early concept design, site investigations, and CEQA and other environmental impact studies and permitting	\$ 241,000.00	05/2021
Design	Design includes, pre- project monitoring, site investigations, formal project design, intermediate and final project completion audits.	\$ 2,153,000.00	06/2022
Construction	Construction cost includes the cost of labor, equipment, material, plus overhead and contingencies. In addition, it includes the present value of 2-years post-construction monitoring.	\$ 27,829,000.00	06/2025
Total Funding:		\$ 30,223,000.00	

Annual Cost Breakdown		
Annual Maintenance Cost:	\$ 741,000.00	
Annual Operation Cost:	\$ 82,000.00	
Annual Monitoring Cost:	\$ 0.00	
Project Life Span:	30 years	

The following table provide details on calculated life-cycle costs for the project (either calculated the Module, or estimated by the Project Developer).

Note: these life-cycle costs are used in Section 4.3 of this output for Water Supply Benefit scoring.

Module-generated Life-Cycle Cost for Project*	\$ 45,599,521.35
Module-generated Annualized Cost for Project*	\$ 2,440,630.44
Use Project Developer estimate instead?	No
Custom Value specified by User:	N/A
Please provide a description of methods used to calculate Life Cycle costs, and attach supplemental information with details of the methodology, assumptions and calculations:	N/A
Supporting PDF	See attachment if applicable.

^{*}Applies an annual discount rate as a static rate equal to 3.375%. The only costs not included in total life-cycle cost are the dismantling and replacement costs at the end of life.

7.2 Cost Share

Is additional funding being provided as a Cost Share for this project?

Yes

The following is a summary of what other sources of funding were explored and/or why funding could not be secured through these other sources:

LA Metro acknowledges that eligible expenditures for this project are only incurred after November 7, 2018.

LA Metro has secured a funding from LADWP via cost-share agreement. Although no other funding is secured prior to the application deadline, LA Metro will continue exploring additional funding opportunities, including Proposition 1 and Measure A.

The following table details the additional funding attained for the project:

Additional Funding						
Type of Cost Share	Sub-Phase Description	Funding Amount	Funding Status	PDF		
Agreements	LA Metro has secured a funding from LADWP via cost-share agreement. If the Project is approved by Measure W, LA Metro will work with LADWP to produce a fund transfer agreement, which will includes details on fund transfer schedule and timeline.	\$ 11,088,000.00	Commitment	scanner@ladwp.com_20201015_142907.pdf		
Total Funding:		\$ 11,088,000.00				

7.3 Funding Request

Total funding requested

\$ 34,515,458.00

The following table shows the requested schedule of funding (by Year and Phase) to create a summary table. A breakdown for the first five years must be provided. The schedule of funding must also match the Requested Funding. In most cases, the entries will not add up to the estimated Life-Cycle cost, as Applicants are discouraged from including long-term O&M costs beyond five years in the funding request.

Funding Requested by Year & Phase					
Year	SCW Funding Requested	Phase	Efforts during		
Year 1	\$ 241,000.00	Planning	Phase and Year Early concept design, site investigations, and CEQA and other environmental impact studies		
Year 1	\$ 1,359,000.00	Design	Pre-project monitoring, site investigations, formal project design, intermediate and final project completion audits, CEQA and other environmental impact studies, and permitting		
Total Year 1	\$ 1,600,000.00		Duringt		
Year 2	\$ 5,070,400.00	Construction	Project construction		
Total Year 2	\$ 5,070,400.00				
Year 3	\$ 6,000,000.00	Construction	Project construction		
Total Year 3	\$ 6,000,000.00		<u> </u>		
Year 4	\$ 6,464,800.00	Construction	Project construction		
Year 4	\$ 823,200.00	O & M	Operation and maintenance of pump stations, drywells, and pretreatment facilities		
Total Year 4	\$ 7,288,000.00				
Year 5	\$ 823,200.00	O & M	Operation and maintenance of pump stations, drywells, and pretreatment facilities		
Total Year 5	\$ 823,200.00				

Funding requested beyond 5 years	\$ 13,733,858.00	O & M	Present values of 28-years of operation and maintenance of pump stations, drywells, and pretreatment facilities
Total Funding requested beyond 5 years	\$ 13,733,858.00		
Total Funding:	\$ 34,515,458.00		

8 ADDITIONAL FEASIBILITY INFORMATION

This section presents additional information regarding project feasibility and technical details gathered during project design and feasibility assessment.

8.1 Environmental Documents and Permits

Environmental Documentation:

- 1. Identify the lead agency for the Project per CEQA.
- 2. Identify environmental documentation (e.g. EIR, MND, ND, Exemption) that has been completed or will be prepared for the Project.
- 3. Discuss the current status and schedule for preparation and notification of environmental documentation.
- 4. State if NEPA is required and identify the lead agency under NEPA, and environmental document (e.g. EIS, FONSI, Categorical Exclusion) that has been completed or will be prepared for the Project.

The anticipated level of CEQA environmental document is a Mitigated Negative Declaration. LA Metro will be the lead agency for the Project.

Potential environmental impacts have been assessed and are summarized in attached PDF below.

Environmental documentation will begin after the project secures Safe, Clean Water Program funding.

NEPA is not required, as there are no federal funds.

Permitting:

- Describe all permit requirements including for the Flood Control permit. Discuss anticipated challenges associated with obtaining permits ie. time and cost. A Flood Control Permit (obtained through epicla.lacounty.gov) is required for any project affecting LACFCD right-of-way and/or facility.
- If a Flood Control Permit is required:
 - Describe how the project will affect LACFCD right-of-way and/or facility.
 - Provide a planning-level schedule showing the time allotted for permit review and issuance in the context of the overall project planning and delivery process.

A permit will be needed from LACFCD to connect to the six County-operated storm drains. The Project will not negatively affect the County storm drain, as the Project will not introduce additional runoff into the storm drains. A detailed hydraulic analysis will be performed to demonstrate the proposed diversion structures will not affect the storm drain conveyance capacity upon permit application.

The current estimated cost of the environmental document and permitting is percentage-based, at 10% of the Planning and Design Capital.

LACFCD permit application is expected to begin in conjunction with the design phase (May 2021). The permit will be obtained prior to the construction starting June 2022.

Attachments for this Section					
Attachment Name	Description				
MOL_CEQA_Environmental_Checklist.pdf	CEQA Checklist for the Proposed Project				

8.2 Vector Minimization

This following provides details on vector minimization strategies.

Does the project have vector minimization plan?

Yes

Provide a description of the vector minimization plan.

Control of mosquitos and other vectors in stormwater management BMPs is critical for protecting public health. The State of California Health and Human Services Agency's Checklist for Minimizing Vector Production in Stormwater Management Structures was used to evaluate opportunities to minimize the proliferation of vectors.

The proposed Project is completely underground and is designed to drain fully in 48 hours (i.e. no standing water 48 hours after rainfall). Proper O&M Plan implementation is expected to mitigate many of the risks for vector proliferation.

Please see an attachment with proposed vector minimization plan.

Attachments for this Section		
Attachment Name Description		
MOL_Vector Minimization Plan_Final.pdf	Vector Minimization Plan for the proposed Project	

8.3 Alternatives Studied

Describe alternatives that were considered and evaluated as part of the Project development:

The main objectives of the project are to improve surface water quality, enhance water supply through capture and infiltration, and reduce localized flooding. Drywells were selected as the primary Project design element to achieve these goals in a fully developed, highly urbanized area.

Other types of stormwater capture devices or green infrastructure, such as bioretention biofiltration or large infiltration galleries, require substantial amounts of land area. As the proposed Project is required to minimize above-surface features in LA Metro-owned parcels and right-of-way in order minimize conflicts with existing land uses, surface features like these are therefore not feasible for this project.

The locations of the proposed drywells were carefully evaluated for compatibility with existing streetscapes, storm drain infrastructure, utilities, surface flow patterns, and known localized flooding patterns.

8.4 Effectiveness

Describe the effectiveness of similar types of projects already constructed if applicable:

A nearby directly comparable project is the Van Nuys Green Streets Project, completed in January 2019, which installed 21 drywells and 20 porous gutters to treat 100 acres of drainage area for a budget of \$3.4 million. According to the post-construction monitoring report, the drywells can effectively capture and infiltrate stormwater runoff up to its design infiltration capacity during the monitored rainfall events, and can recharge 50 ac-ft stormwater runoff in an average year. Given the similarities in the design, the proposed project would be expected to have a similar level of performance.

8.5 Legal Requirements and Obligations

Describe any legal requirements or obligations that may arise as a result of constructing the Project and how these requirements will be satisfied:

As discussed under "Environmental Documents and Permits", a Mitigated Negative Declaration level CEQA documentation is expected for the Project. In addition, the Project is also required to obtain permit from LACFCD prior to construction. No additional legal requirements and obligations are anticipated for the Project. Projects of similar scope have been installed at project proximity with no dispute.

8.6 Technical Reports

Please upload additional technical reports related to this project not provided above.

8.7 Other

Provide any additional information related to the Project as necessary:

A sample of LA Metro's local drought-tolerant plant palette is provided to illustrate trees and shrubs that will be planted along the MOL bike and pedestrian paths following Project completion

Attachments for this Section		
Attachment Name	Description	
Plant Palette Drought Tolerant.pdf	Local drought-tolerant plants that will be planted along the MOL bike path upon project completion	

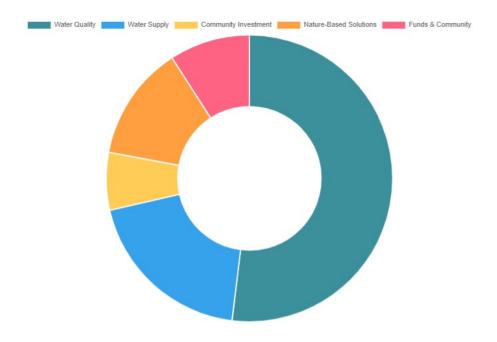
9 SCORING

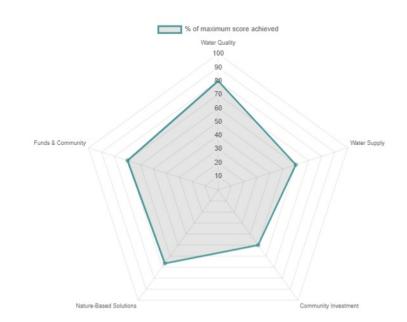
This section summarizes scoring calculations generated by the Module. All Regional Program Projects must meet the Threshold Score of 60 points or more using the following Project Scoring Criteria to be eligible for consideration.

Note: all scoring estimates are considered preliminary and subject to review and revision by the Scoring Committee.



The following graphics summarize the project scoring. The first graphic shows the components of the project score, based on the different scoring sections. The second graphic shows the percent of maximum score achieved by the project within each scoring section.





The following table details the scoring calculated for the project, along with the scoring thresholds from the SCW Project Scoring Criteria:

Scoring Section	Project Score	Max Score	Scoring Criteria Thresholds	
Water Quality Wet + Dry Weather Part 1	20	20	Cost Effectiveness = (24-hour BMP Capacity) / (Construction Cost in \$Millions) • <0.4 = 0 points • 0.4-0.6 = 7 points • 0.6-0.8) = 11 points • 0.8-1.0 = 14 points • >1.0 = 20 points	
Water Quality Wet + Dry Weather Part 2	20	30	Primary Pollutant Reduction: > >50% = 15 points > 80% = 20 points Secondary Pollutant Reduction: > >50% = 5 points > >80% = 10 points	
Water Quality Dry Weather Only Part 1	N/A	20	For dry weather BMPs only, Projects must be designed to capture, infiltrate, or divert 100% (unless infeasible or prohibited for habitat, etc.) of all tributary dry weather flows.	
Water Quality Dry Weather Only Part 2	N/A	20	For Dry Weather BMPs Only. Tributary Size of the Dry Weather BMP: • <200 Acres = 10 points • >200 Acres = 20 points	
Water Supply Part 1	3	13	 \$2500/ac-ft = 0 points \$2,000-2,500/ac-ft = 3 points \$1500-2,000/ac-ft = 6 points \$1000-1500/ac-ft = 10 points <\$1000/ac-ft = 13 points 	
Water Supply Part 2	12	12	 <25 ac-ft/year = 0 points 25 - 100 ac-ft/year = 2 points 100 - 200 ac-ft/year = 5 points 200 - 300 ac-ft/year = 9 points >300 ac-ft/year = 12 points 	
Community Investment	5	10	 One Benefit = 2 points Three Benefits = 5 points Six Benefits = 10 points 	
Nature Based Solutions	10	15	 Implements natural processes or mimics natural processes to slow, detain, capture, and absorb/infiltrate water in a manner that protects, enhances and/or restores habitat, green space and/or usable open space = 5 points Utilizes natural materials such as soils and vegetation with a preference for native vegetation = 5 points Removes Impermeable Area from Project (1 point per 20% paved area removed) = 5 points 	

Leveraging Funds Part 1	3	6	 >25% Funding Matched = 3 points >50% Funding Matched = 6 points
Leveraging Funds Part 2	4	4	The Project demonstrates strong local, community-based support and/or has been developed as part of a partnership with local NGOs/CBOs.
Total	77	110 / 100	

10 ATTACHMENTS

Attachments are bundled and organized in the following pages, with cover pages between each subsection.

Please note – at a minimum, a feasibility study must attach the following:

- A Location Map
- A Schematic with Proposed Footprint and Key Components
- A Map of the Capture Area (Tributary Map)
- Technical Reports (e.g. soil report, hydrology report, hydraulic study, utility search, survey, PEIR, EIR, monitoring data, etc.)



ATTACHMENTS FOR SECTION 1.3:

PROJECT SUMMARY

Metro Orange Line Water Infiltration and Quality Project – Project Summary





Project Overview

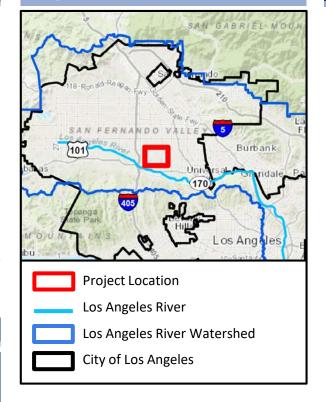
The project proposes to implement 168 drywells with pretreatment facilities along the Metro Orange Line (MOL) right-of-way in San Fernando Valley to capture, treat, and infiltrate stormwater runoff from 2,319 acres drainage area. It takes advantage of highly fortuitous siting as it intersects primary drainages in the region. Utilizing existing LACFCD infrastructure, the project intercepts, treats and infiltrates stormwater prior to discharge to the LA River. Furthermore, the infiltration occurs in the highest-value groundwater recharge areas within the City of Los Angeles. Use of existing LA Metro property avoids potential complications associated with land acquisition, and project siting can be conducted adding a largely subsurface beneficial use, without disrupting primary transportation functions. The Project catchment areas do not overlap with those from other existing or proposed infiltration projects.

The Project will be integrated into the MOL Bus Rail Transit (BRT) Improvements Project, which is a capital improvement project that will provide community benefits such as creating fast and reliable ridership, and enhancing pedestrian safety in disadvantaged communities and neighborhoods with significant unmet needs. Integrating the project with MOL BRT Improvement Project will also save construction cost and expedite project implementation process.

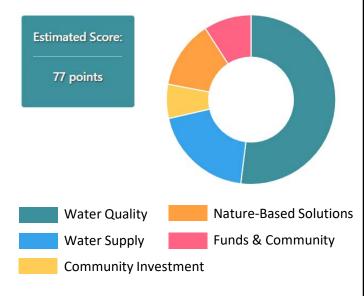
Project Highlights

- The Project can provide an annual groundwater recharge yield between **780 and 1,050 acrefeet/year** into the San Fernando Groundwater Basin.
- The Project will remove 65% of the zinc and bacteria pollutant load on an annual average basis
- The Project will make **LA Metro net water positive**, allowing Metro to contribute more to regional groundwater infiltration than it uses to support all of its operations.
- The estimated capital cost of the project is \$32 million (planning, design, construction). The estimated annual operation and maintenance cost is approximately \$0.8 million per year. Los Angeles Department of Water and Power (LADWP) has agreed to fund 39% of the Project capital cost.
- LA Metro has engaged several key stakeholders in the development of the Project. This included targeted discussions with agencies such as LADWP, LA Sanitation, and StreetsLA and community organizations, such as Climate Resolve, Council for Watershed Health, and the NRDC. To date the Project has received three letters of support from the stakeholders.

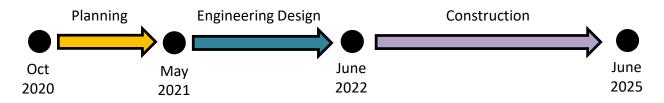
Project Location



SCW Score Summary



Project Schedule



Metro Orange Line Water Infiltration and Quality Project – SCW Score Details



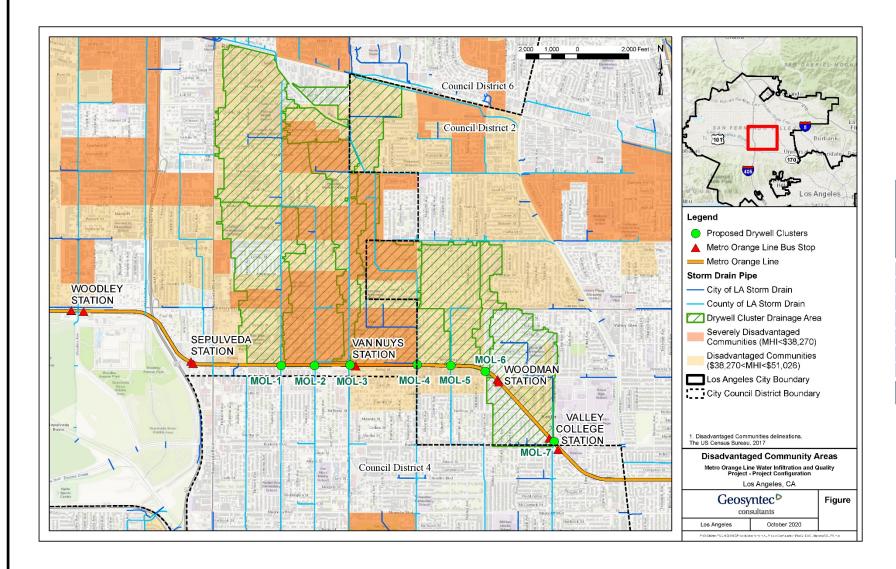


Scoring Section	Project Score	Max Possible Points	Project Score Description
Water Quality Wet + Dry Weather Part 1	20	20	Cost Effectiveness >1.0 acre-feet capacity / \$ million
Water Quality Wet + Dry Weather Part 2	20	30	Long-Term Pollutant Load Reduction Primary Class of Pollutants: >50% Second Class of Pollutants: >50%
Water Supply Part 1	3	13	Cost Effectiveness \$2,000–2,500/ac-ft
Water Supply Part 2	12	12	Annual Average Wet Weather Capture for Water Supply >300 ac-ft/year
Community Investment	5	10	Three distinct Community Investment Benefits
Nature-Based Solutions	10	15	Implements natural processes or mimics natural processes to slow, detain, capture, and absorb/infiltrate water in a manner that protects, enhances and/or restores habitat, green space and/or usable open space Utilizes natural materials such as soils and vegetation with a preference for native vegetation
Leveraging Funds Part 1	3	6	>25% Funding Matched
Leveraging Funds Part 2	4	4	The Project demonstrates strong local, community-based support and/or has been developed as part of a partnership with local NGOs/CBOs.
Totals	77	110	

Metro Orange Line Water Infiltration and Quality Project – Drainage Area Overview





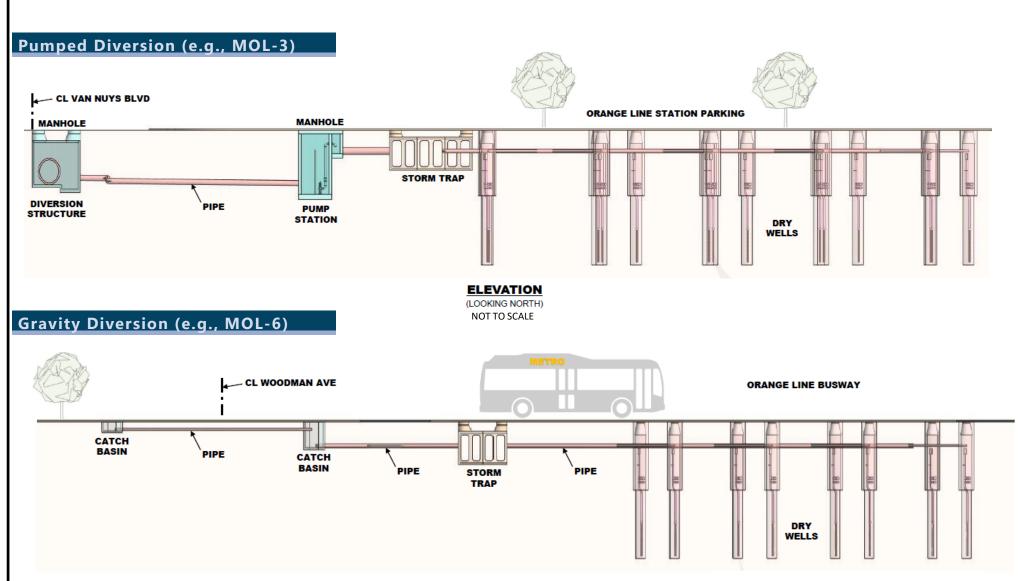


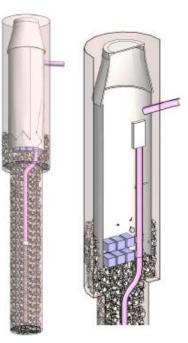
Drywell Cluster ID	Drainage Area (ac)	Number of Drywells Proposed	Annual Groundwater Recharge Range (acre-feet)
MOL-1	308	24	100 - 140
MOL-2	683	40	210 - 290
MOL-3	197	14	80 - 110
MOL-4	579	39	200 - 280
MOL-5	193	13	50 - 70
MOL-6	67	10	40 - 40
MOL-7	292	28	100 - 120
Total	2,319	168	780 – 1,050

Metro Orange Line Water Infiltration and Quality Project – Example Design Schematic









DRY WELL DETAILS

ELEVATION

(LOOKING NORTH-EAST) NOT TO SCALE



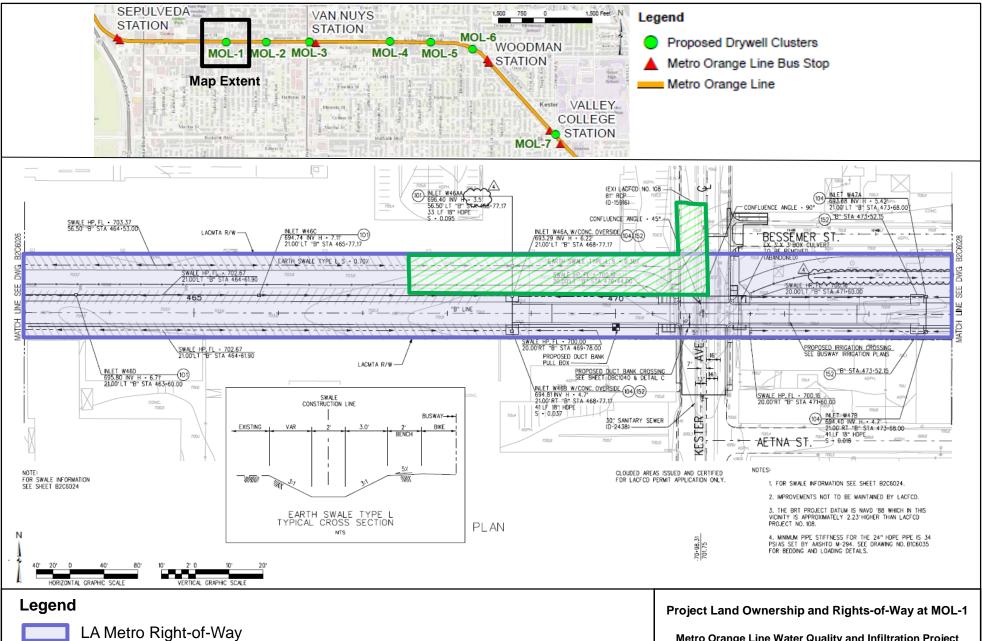
ATTACHMENTS FOR SECTION 1.1:

OVERVIEW



ATTACHMENTS FOR SECTION 1.2:

PROJECT LOCATION

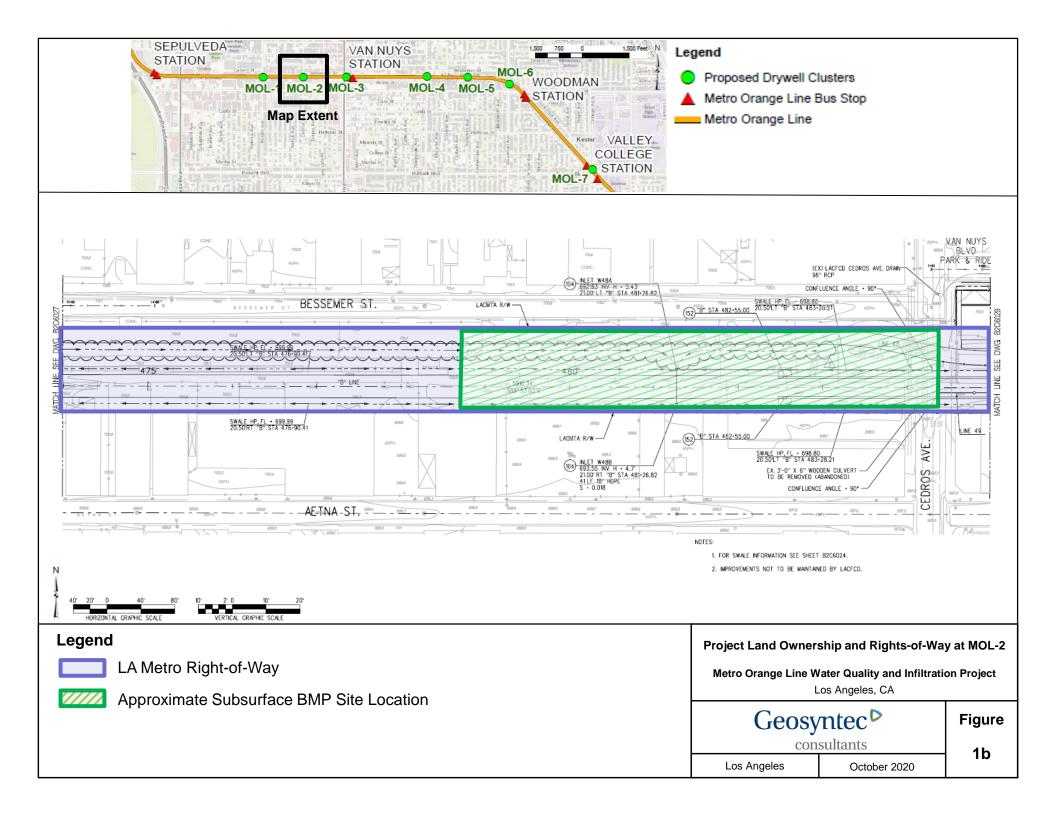


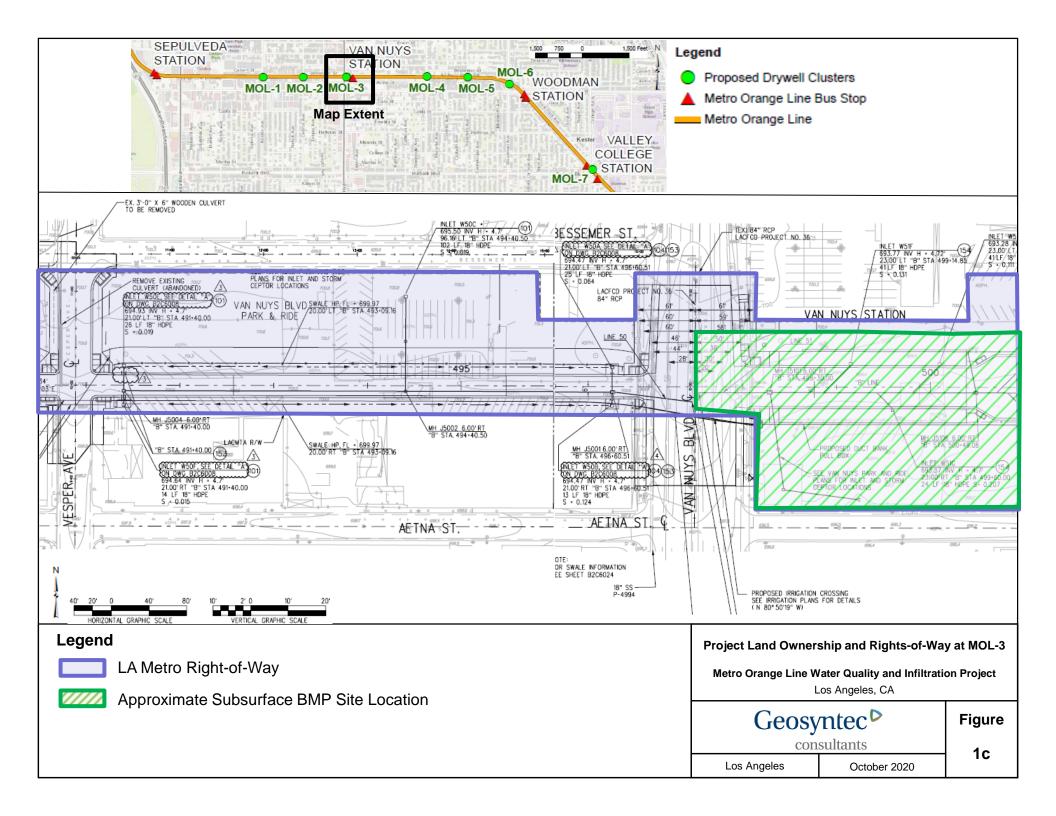
Approximate Subsurface BMP Site Location

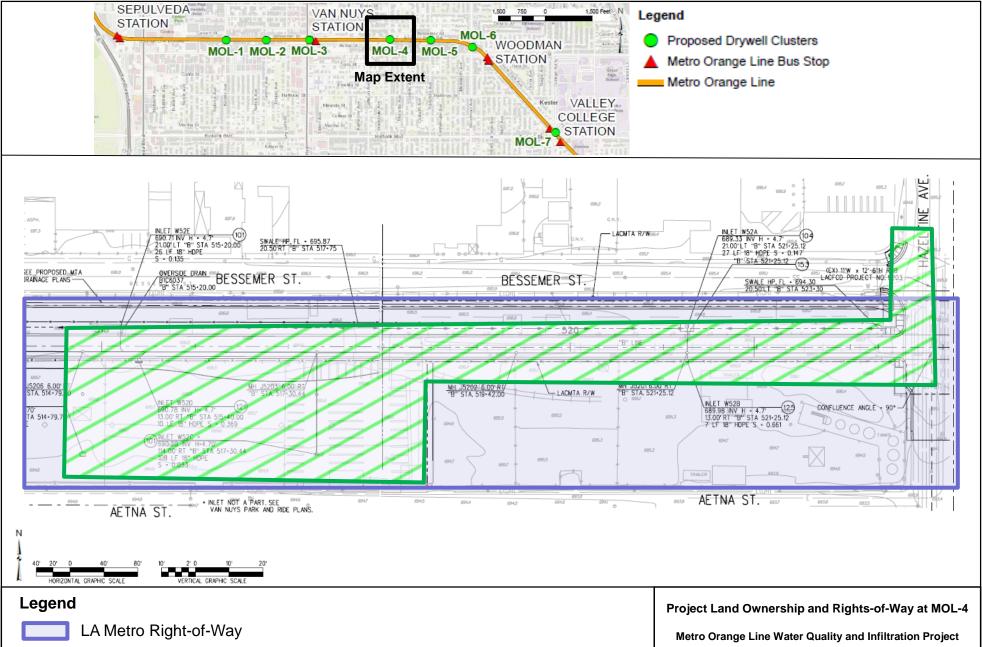
A minor subsurface component of the proposed Project (diversion structure and piping) is located underneath City of Los Angeles Right-of-Way. Proper easement will be obtained from the City at later Project planning stage.

Metro Orange Line Water Quality and Infiltration Project
Los Angeles, CA

Geosy	Figure	
con	1a	
Los Angeles October 2020		Ia







Approximate Subsurface BMP Site Location

A minor subsurface component of the proposed Project (diversion structure and piping) is located underneath City of Los Angeles Right-of-Way. Proper easement will be obtained from the City at later Project planning stage.

Los Angeles, CA

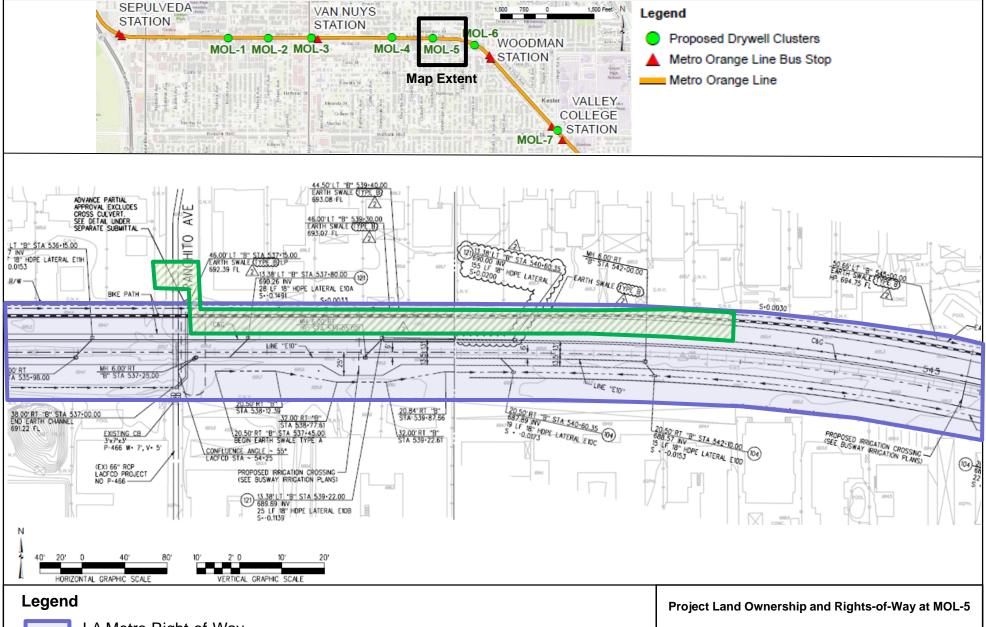
Geosyntec [▶]		
consultants		

Figure

1d

Los Angeles

October 2020



LA Metro Right-of-Way

Approximate Subsurface BMP Site Location

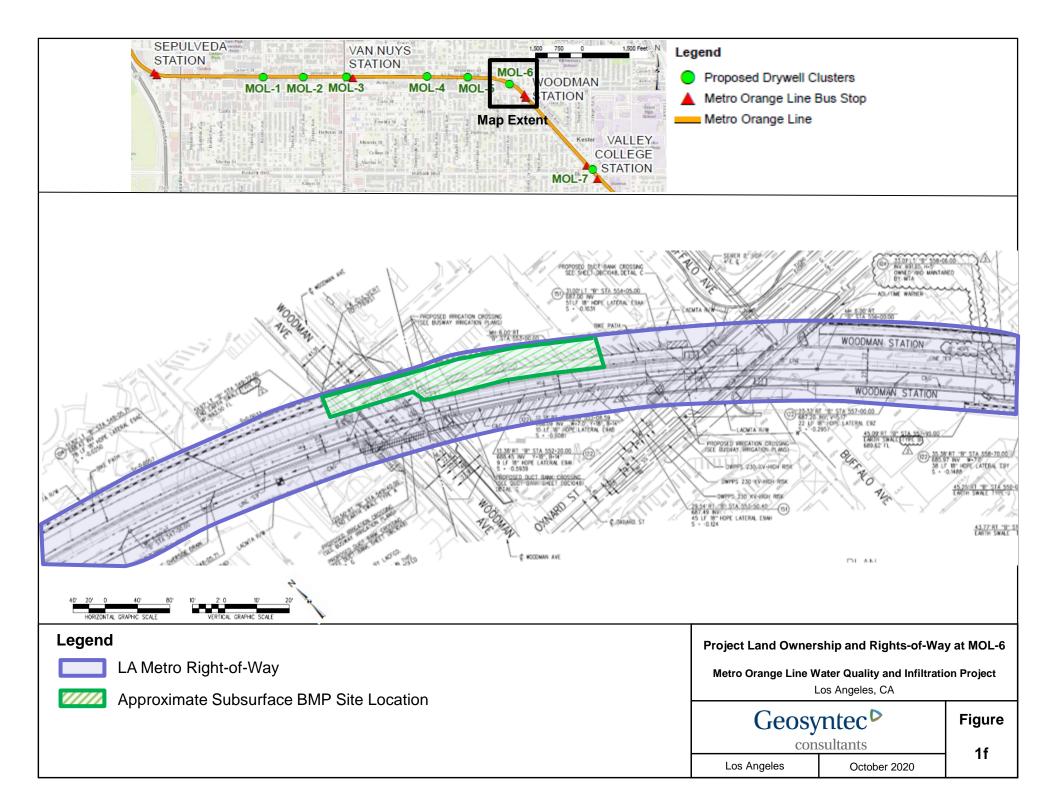
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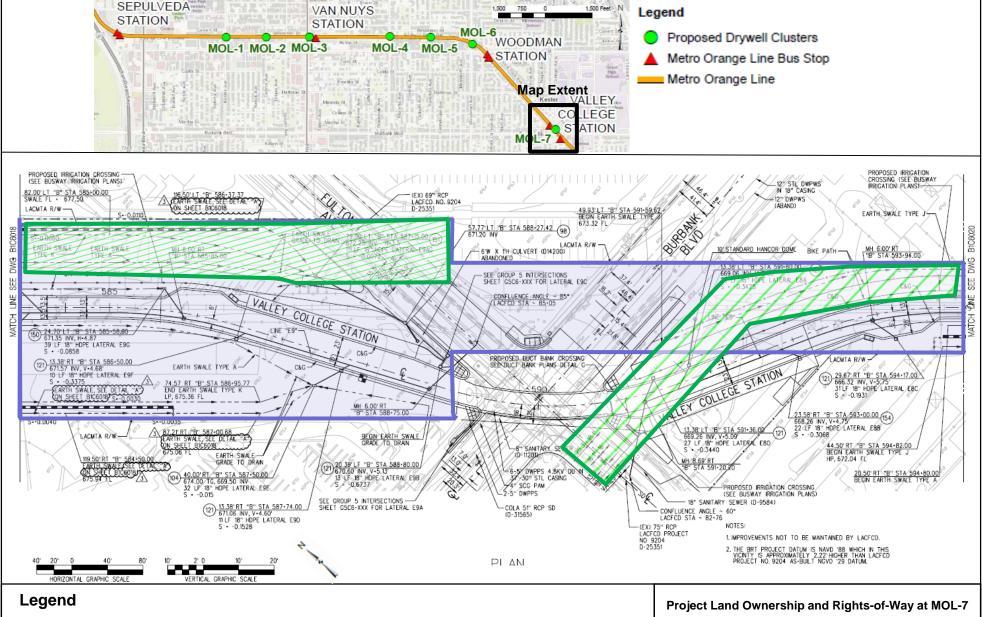
Metro Orange Line Water Quality and Infiltration Project Los Angeles, CA

Geosyntec D	
consultants	

Figure

Los Angeles October 2020 1e





LA Metro Rights-of-Way

Approximate Subsurface BMP Site Location

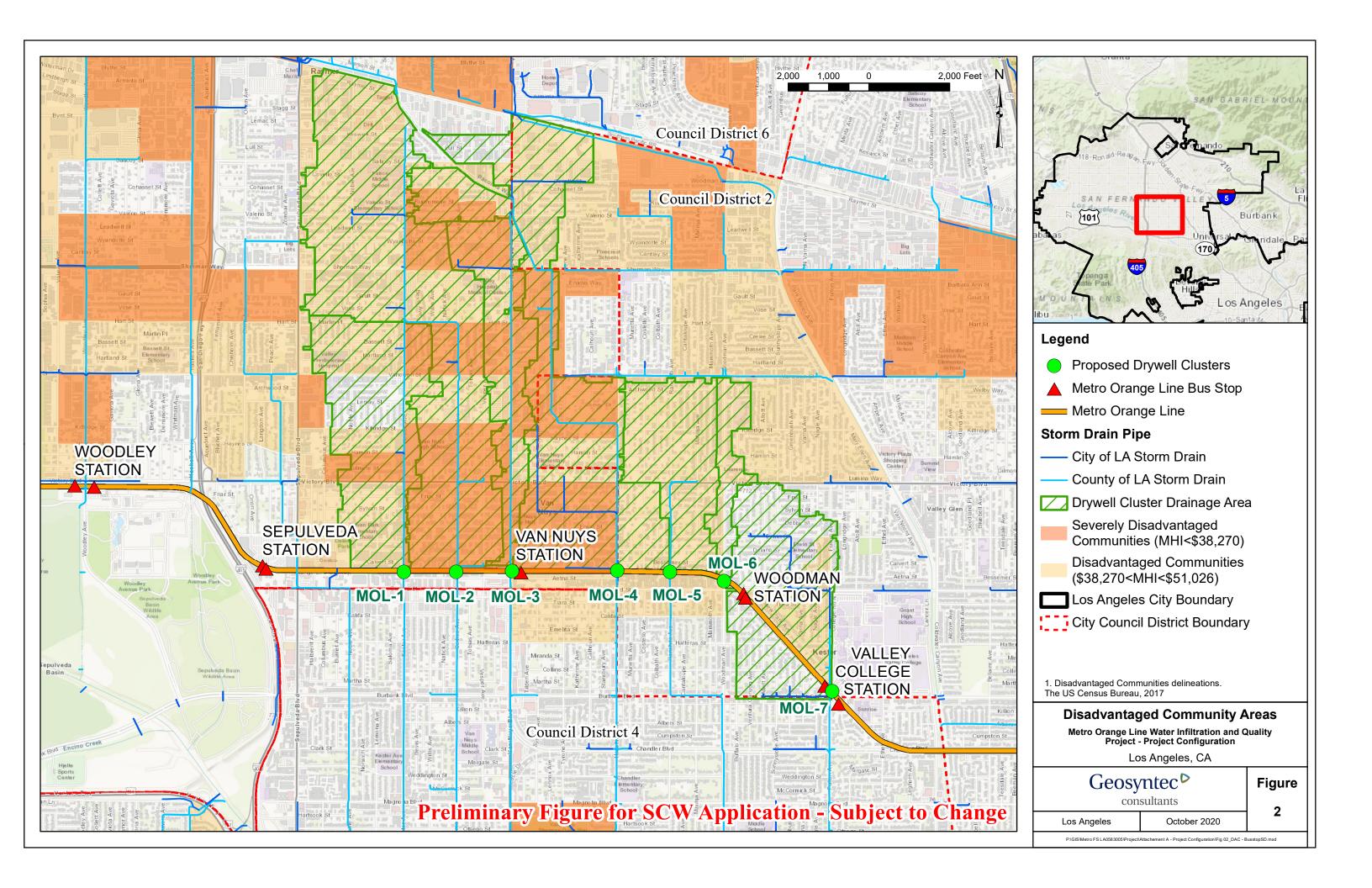
A minor subsurface component of the proposed Project (diversion structure and piping) is located underneath City of Los Angeles Right-of-Way. Proper easement will be obtained from the City at later Project planning stage.

Metro Orange Line Water Quality and Infiltration Project Los Angeles, CA

Geosyntec [▶]	
consultants	

Figure

Los Angeles October 2020 1g





ATTACHMENTS FOR SECTION 2.1:

CONFIGURATION





engineers | scientists | innovators

Project Configuration

Metro Orange Line Water Infiltration and Quality Project

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement infiltration best management practices (BMPs) within LA Metro parcels and right-of-way (ROW) in the San Fernando Valley area within the City of Los Angeles.

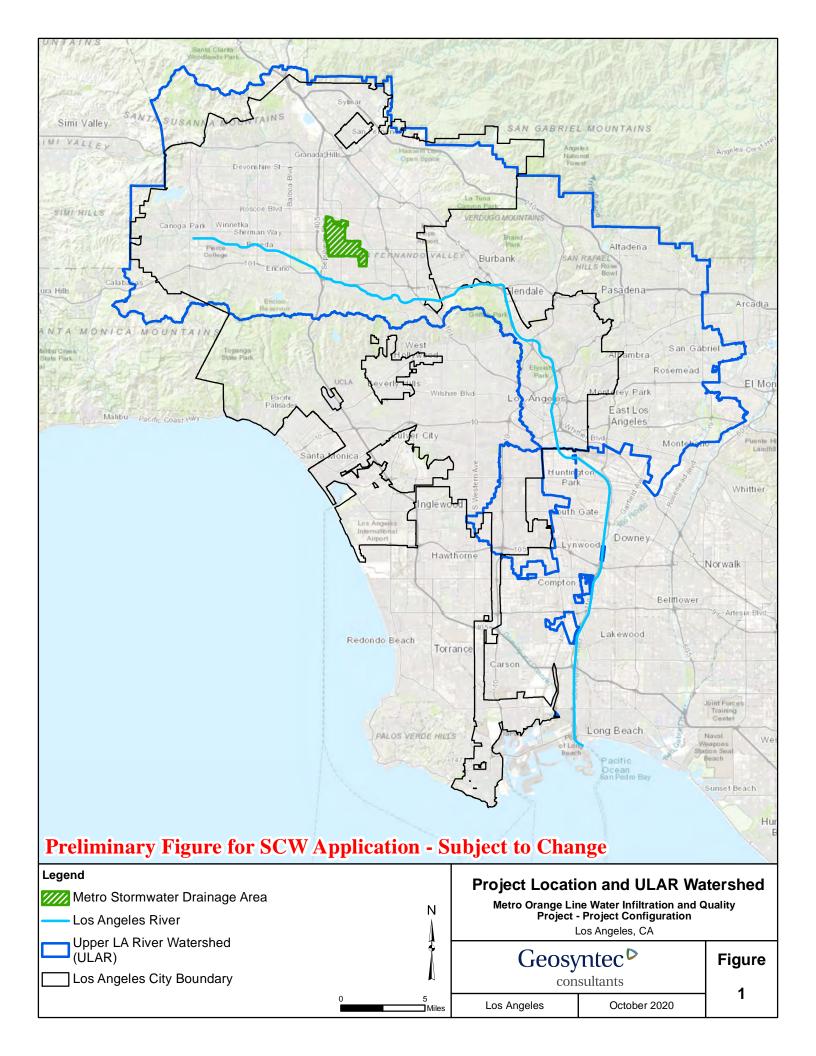
As shown in Figure 1, the Project is located within the Upper Los Angeles River (ULAR) Watershed, in the San Fernando Valley area of the City of Los Angeles. The Project aims to achieve the following objectives:

- Primary Objective: Achieve water supply benefits through capture and infiltration;
- Secondary Objectives: Improve surface water quality downstream of the Project area, and reduce the risk of potential localized flooding by alleviating peak flow rate.

To meet these objectives, 168 drywells are proposed, as well as underground pretreatment facilities, separated into seven geographic clusters. All drywells are proposed to be installed fully subsurface without surface-level pretreatment, minimizing any potential disruption to the Metro Orange Line operation. Since the Project relies on diverting stormwater runoff from the Los Angeles County Flood Control District (LACFCD) storm drains, an LACFCD connection permit will be obtained. No other Project components are proposed within other public owned property or right-of-way. Preliminary BMP configuration and typical design details are included in Appendix A.

FIGURES

Project Configuration October 2020

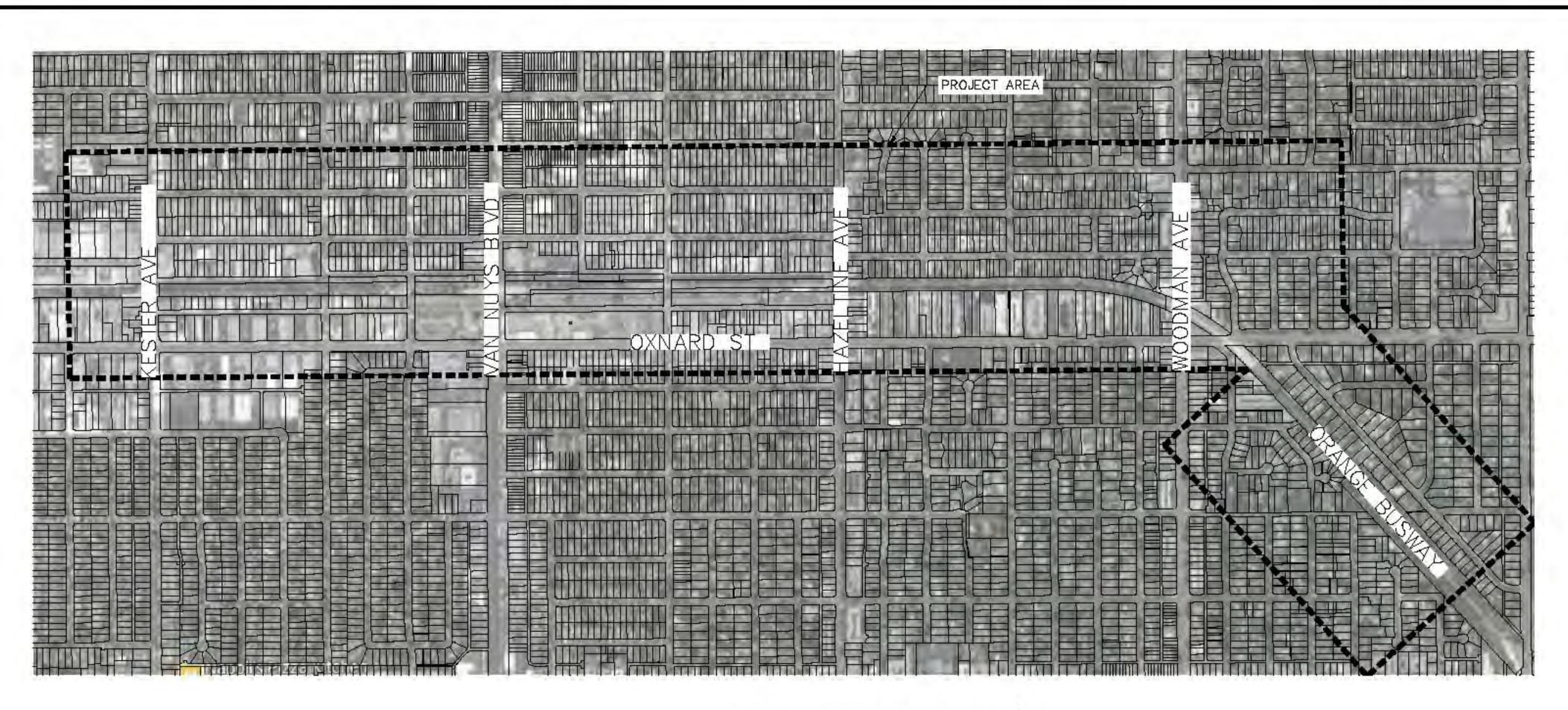


Appendix APreliminary Drawing

Project Configuration October 2020

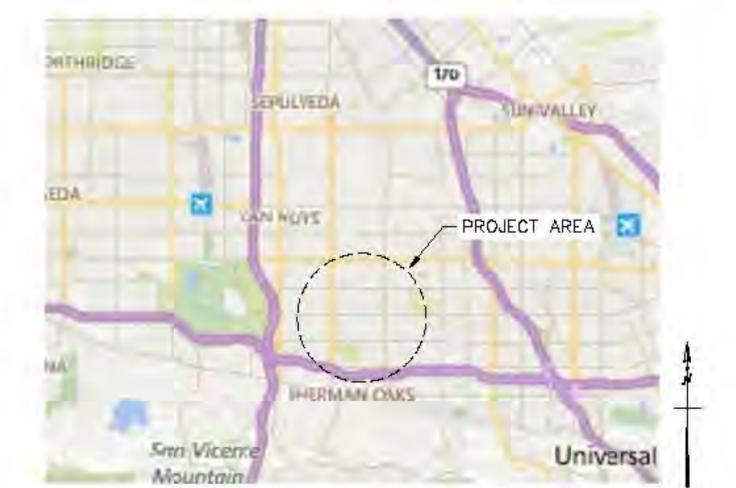
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

Metro Orange Line Stormwater Capture and Recharge





	SHEET	INDEX	
SHEET NO.	SHEET TITLE	SHEET NO.	SHEET TITLE
1	TITLE SHEET	13	PRETREATMENT DETAIL & SECTION
2	NOTES, ABBREVIATIONS & SYMBOLS	14	PRETREATMENT DETAILS
3	MOL 1	15	DIVISION STRUCTURE DETAILS
4	MOL 2	16	PUMP STATION DETAILS
5	MOL 3	17	DRYWELL & TRENCH DETAILS
6	MOL 4 SHEET 1 OF 2	18	CATCH BASIN DETAILS
7	MOL 4 SHEET 2 OF 2		
8	MOL 5		
9	MOL 6		
10	MOL 7 SHEET 1 OF 2		
11	MOL 7 SHEET 2 OF 2	1	
12	PRETREATMENT DETAIL & PLAN		



LOCATION MAP

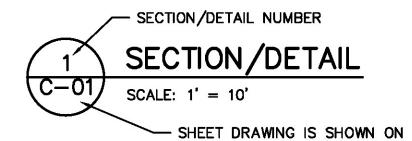
FOR SAFE CLEAN WATER PROGRAM APPLICATION NOT FOR CONSTRUCTION

SHEET 1 OF 17 SHEETS

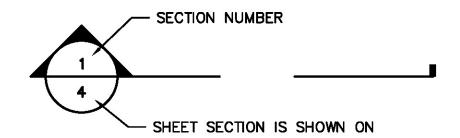
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SYMBOLS:

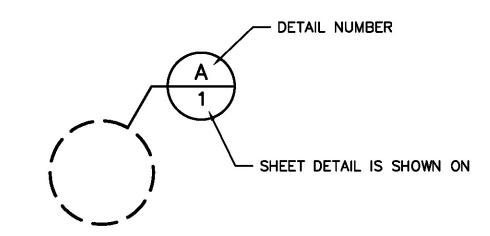
TITLE MARKERS



SECTION MARKERS



DETAIL MARKERS



LEGEND:

	PARCEL LINE
	STREET CENTERLINE
SD	EX STORM DRAIN
SS	EX SANITARY SEWER
G	EX WATER LINE
——————————————————————————————————————	EX WATER LINE
——— FO ———	EX FIBER OPTICS LINE
——————————————————————————————————————	EX OVERHEAD LINES

NOTICE TO CONTRACTORS:

- THIS IMPROVEMENT CONSISTS OF WORK CALLED FOR ONLY ON THIS PLAN.
- 2. INSPECTION: ALL WORK AND MATERIALS SHALL BE INSPECTED BY THE INSPECTOR OF PUBLIC WORKS DURING CONSTRUCTION PURSUANT TO LATEST EDITION OF "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" (GREENBOOK) AS AMENDED BY THE CITY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS 'BROWN BOOK", AND THE STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION AS APPLICABLE, CALL INSPECTION DISPATCH AT (213) 485-5080 BEFORE NOON OF THE WORKING DAY BEFORE THE FIRST SCHEDULED DAY OF CONSTRUCTION.

PRIOR TO THE START OF ANY CONSTRUCTION, DEMOLITION, REMOVALS, SAWCUTING, OR INSTALLATION OF TRAFFIC CONTROL, THE CONTRACTOR SHALL MEET WITH THE INSPECTOR TO DISCUSS SAFETY, TRAFFIC CONTROL REQUIREMENTS, PUBLIC ACCESS, CONSTRUCTION IMPACT MITIGATION, REMOVAL LIMITS, AND CONTRACTOR'S PLANNED SEQUENCING OF OPERATIONS. PRIOR TO OR AT THE PROJECT PRECONSTRUCTION MEETING THE CONTRACTOR SHALL PROVIDE THE INSPECTOR TWO (2) SETS OF FULL-SIZE PLANS AND MAINTAIN ONE (1) SET OF FULL-SIZE PLANS AT THE SITE DURING CONSTRUCTION.

- 3. IN CONFORMANCE WITH LOS ANGELES CITY ORDINANCE NO. 150,478 POTHOLE EXISTING SUBSURFACE INSTALLATIONS CARRYING UNSTABLE SUBSTANCES TO DETERMINE THEIR LOCATIONS AND ELEVATIONS BEFORE COMMENCING EXCAVATION.
- 4. UNDERGROUND SERVICE ALERT: BEFORE COMMENCING ANY EXCAVATION, OBTAIN AN UNDERGROUND SERVICE ALERT (USA) INQUIRY I.D. NUMBER BY CALLING 811 OR (800) 422-4133. TWO WORKING DAYS SHALL BE ALLOWED AFTER THE I.D. NUMBER IS OBTAINED AND BEFORE THE CONTRACTOR STARTS THE EXCAVATION WORK SO THAT UTILITY OWNERS CAN BE NOTIFIED. IF THE UTILTIY OWNER IS THE CITY OF LOS ANGELES, A CONFIRMATION NUMBER INDICATING THE CITY HAS BEEN NOTITIED SHALL BE OBTAINED BY USA AND/OR THE CONTRACTOR FROM THE APPROPRIATE CITY DEPARTMENT. THE I.D. NUMBER TOGETHER WITH THE DATE ACQUIRED SHALL BE REPORTED TO THE BUREAU OF CONTRACT ADMINISTRATION WHEN CALLING FOR INSPECTION. I.D. NUMBERS WILL NOT BE GIVEN MORE THAN TEN (10) DAYS BEFORE STARTING EXCAVATION WORK.
- AT LEAST THIRTY (30) DAYS BEFORE THE START OF CONSTRUCTION CONTACT THE BUREAU OF STREET SERVICES, COORDINATING SECTION AT (213) 847-3200 TO VERIFY THAT THERE IS NO PROPOSED PROJECT IN THIS AREA.
- 6. NOTIFICATION: AT LEAST TEN (10) DAYS BEFORE THE START OF CONSTRUCTION, NOTIFY, IN WRITING, ABUTTING PROPERTY OCCUPANTS OF THE PROPOSED CONSTRUCTION START DATE. A COPY OF SAID WRITTEN NOTIFICATION SHALL BE PROVIDED TO THE PUBLIC WORKS INSPECTOR FOR APPROVAL BEFORE THEY ARE DISTRIBUTED TO THE OCCUPANTS OF THE
- PROVIDE TRAFFIC CONTROL PER THE LATEST EDITION OF THE WORK AREA TRAFFIC CONTROL HANDBOOK (WATCH) MANUAL ADOPTED BY THE CITY OF LOS ANGELES BOARD OF PUBLIC WORKS.
- PROTECTION OF EXISTING FACILITIES: UNLESS OTHERWISE SPECIFICALLY STATED IN THESE DRAWINGS. PROTECT ALL EXISTING IMPROVEMENTS INCLUDING UTILITIES. FACILITIES DISTURBED OR DAMAGED BY THE CONTRACTOR ARE TO BE RESTORED WITH MATERIALS EQUAL OR BETTER THAN THE ORIGINAL AT THE CONTRACTOR'S EXPENSE.

GENERAL NOTES:

- PRIOR TO START OF CONSTRUCTION, VERIFY ALL EXISTING CONDITIONS REQUIRED TO PERFORM WORK. IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE DRAWINGS, NOTIFY THE ENGINEER IMMEDIATELY AND STOP WORK UNTIL DIFFERING CONDITIONS HAVE BEEN EVALUATED.
- SHOULD CONFLICTING INFORMATION BE FOUND ON THE PLANS, NOTIFY THE ENGINEER BEFORE PROCEEDING WITH THE WORK IN QUESTION.
- MINIMUM SAFETY STANDARDS: COMPLY WITH ALL APPLICABLE STATE OF CALIFORNIA, DEPARTMENT OF INDUSTRIAL RELATIONS, AND DIVISION OF OCCUPATIONAL SAFETY AND HEALTH (CAL/OSHA) SAFETY STANDARDS.
- TEMPORARY FACILITIES: CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY FACILITIES INCLUDING POWER, WATER, AND SANITARY FACILITIES NEEDED FOR

EROSION & SEDIMENT CONTROL NOTES:

- 1. ALL CONSTRUCTION/DEMOLITION, GRADING, AND STORAGE OF BULK MATERIALS MUST COMPLY WITH THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE 403 FOR FUGITIVE DUST.
- 2. ALL DEBRIS SHALL BE CLEANED UP DAILY AND SECURED AT THE END OF
- PROTECT DOWNSTREAM CATCH BASIN AND SURFACE WATERS FROM CONVEYANCE OF CONSTRUCTION POLLUTANTS. MAINTAIN AND MODIFY AS NEEDED DURING CONSTRUCTION.

SPECIFICATIONS:

- GENERAL:
- 1.1. ALL WORK SHALL CONFORM TO THE LATEST EDITION AND SUPPLEMENTS OF

- "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" (GREENBOOK), AND CORRESPONDING "ADDITIONS AND AMENDMENTS TO THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORK CONSTRUCTION" (BROWN BOOK).
- 1.2. INSTALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER GUIDELINES UNLESS OTHERWISE NOTED ON DRAWINGS AND SPECIFICATIONS.
- 1.3. EQUAL PRODUCTS: CONTRACTOR CAN PROVIDE "EQUAL" PRODUCTS FOR ALL MATERIALS SPECIFIED. IF EQUAL PRODUCTS ARE PRUPOSED, IT IS THE CONTRACTOR'S RESPONSIBILITY TO DEMONSTRATE THAT THE PROPOSED PRODUCTS ARE EQUAL TO THE SPECIFIED PRODUCT. PRE-APPROVED MATERIALS ARE NOTED IN PARENTHESIS.
- EARTHWORK:
- 2.1. NO FILL TO BE PLACED UNTIL EXCAVATION BOTTOM HAS BEEN INSPECTED AND APPROVED BY THE ENGINEER.
- 2.2. SUBGRADE PREPARATION: SCARIFY AND RE-COMPACT TOP 6 INCHES OF LOOSE OR DISTURBED SUBGRADE UNLESS OTHERWISE DIRECTED BY THE ENGINEER. FILL MAY BE PLACED DIRECTLY ON TOP OF THE UNDISTURBED NATIVE MATERIALS AS DETERMINED BY THE ENGINEER.
- 2.3. FILL MATERIAL: SCREENED NATIVE MATERIALS ARE SUITABLE FOR USE AS FILL MATERIAL. SCREENED NATIVE MATERIALS SHALL BE FREE OF ORGANIC MATTER, DELETERIOUS MATERIALS, AND ROCKS OR OTHER OBJECTS LARGER THAN 2 INCHES.
- 2.4. ALL FILL SHALL BE COMPACTED TO THE FOLLOWING MINIMUM RELATIVE COMPACTION CRITERIA:
- 2.4.1. BASE MATERIAL UNDER ROADWAYS, CURB, AND GUTTER: 95 PERCENT
- 2.4.2. BASE MATERIAL UNDER CATCH BASINS AND MAINTENANCE HOLES: 95
- 2.4.3. BASE MATERIAL UNDER NON-TRAFFIC AREAS: 90 PERCENT
- 2.4.4. SOIL BACKFILL: 90 PERCENT
- 2.4.5. DISTURBED SUBGRADE: 90 PERCENT
- 3. PIPE AND FITTINGS:
- 3.1. PIPE AND FITTINGS:
- 3.1.1. PIPE BETWEEN PRETREATMENT CHAMBER AND DRYWELL: PVC SCH 40
- 3.1.2. SUBDRAINS: PVC SCH 40 PERFORATED WITH 1/2-INCH DIAMETER PERFORATIONS; 2 ROWS AT 120 DEGREES APART AND 5 INCHES ON CENTER; PLACE PERFORATIONS FACING DOWN
- 3.1.3. ALL OTHER PIPE AND FITTINGS: PVC SDR-35 UNLESS OTHERWISE SHOWN ON DRAWINGS
- 3.1.4. PROVIDE FITTINGS AND ADAPTERS AS NECESSARY TO COMPLETE WORK
- 3.2. PROVIDE MINIMUM SLOPE OF 1 PERCENT UNLESS OTHERWISE SHOWN ON DRAWINGS
- 3.3. PIPE BEDDING, WHERE REQUIRED, SHALL BE ONE OF THE FOLLOWING:
- 3.3.2. GREENBOOK SECTION 200-1.2.1 1/2-INCH CRUSHED ROCK
- 3.3.3. UNDISTURBED NATIVE FREE DRAINING MATERIAL
- 4. DRAINAGE STRUCTURES:
- 4.1. PRETREATMENT CHAMBER AND/OR DRYWELL SYSTEM: "TORRENT RESOURCES
- 4.2. CLEANOUT ACCESS FRAME AND COVER: CAST IRON ROUND (LONG BEACH IRON WORKS 1241/X-510B)
- 4.3. PIPE SCREEN: 304 STAINLESS STEEL OR GALVANIZED STEEL, 16 GAGE MINIMUM THICKNESS, WITH 5 MILLIMETER PERFORATIONS AND 51% OPEN SPACE (BIO CLEAN CONNECTOR PIPE SCREEN U-3.7); ANCHOR WITH 304 OR 316 STAINLESS STEEL CONCRETE ANCHORS
- 5. ROCK MATERIALS:
- 5.1. BASE: GREENBOOK SECTION 200-2.2 CRUSHED AGGREGATE BASE
- 5.2. GRAVEL DRAINAGE LAYER: GREENBOOK SECTION 200-1.2 1-INCH" CRUSHED
- 6. GEOTEXTILE/GEOMEMBRANE:
- 6.1. NON-WOVEN GEOTEXTILE: GREENBOOK SECTION 213-5 NON-WOVEN TYPE 90N (TENCATE MIRAFI 140N)
- 7. CONCRETE MATERIALS:
- 7.1. CONCRETE CURB, GUTTER, AND SIDEWALK: GREENBOOK SECTION 201-1 CLASS 520-C-2500
- 7.2. OTHER CAST-IN-PLACE OR PRECAST DRAINAGE STRUCTURES: GREENBOOK SECTION 201-1 CLASS 560-C-3250
- 7.3. NON-SHRINK GROUT: GREENBOOK SECTION 201-7.3
- 7.4. MORTAR: GREENBOOK SECTION 201-5 CLASS C
- 7.5. CONCRETE SLURRY:
- 7.5.1. DRYWELL BACKFILL: TWO-SACK SLURRY
- 7.5.2. ALL OTHER APPLICATIONS: GREENBOOK SECTION 201-1 CLASS

- 100-E-100
- 7.6. CONCRETE JOINTS: GREENBOOK SECTION 303-5.4
- 7.7. PREMOLDED JOINT FILLER: GREENBOOK SECTION 201-3.2 NONEXTRUDING AND RESILIENT FILLER (BITUMINOUS)
- 7.8. CONCRETE FINISH: GREENBOOK SECTION 303-5.5
- 7.9. CONCRETE CURING: GREENBOOK SECTION 201-4.1 TYPE 1-D MEMBRANE CURING COMPOUND
- 7.10. EPOXY ADHESIVE ANCHOR: HILTI HIT-RE 100

WITH ORGANIC COMPOST MATERIAL

- 8. BITUMINOUS MATERIALS:
- 8.1. SURFACE ASPHALT CONCRETE COURSE: GREENBOOK/BROWNBOOK SECTION 203-6.4 CLASS D2-PG-64-10
- 8.2. BASE ASPHALT CONCRETE COURSE: GREENBOOK/BROWNBOOK SECTION 203-6.4 CLASS B-PG-64-10
- 9. LADNSCAPE MATERIALS:
- 9.1. PLANTING SOIL SHALL BE ONE OF THE FOLLOWING UNLESS OTHERWISE
- 9.1.1. 50-50 MIX OF SELECT ON-SITE SOIL APPROVED BY THE ENGINEER
- 9.1.2. 50-50 MIX OF SSPWC SECTION 800-1.1 CLASS "A" TOPSOIL WITH ORGANIC COMPOST MATERIAL
- 9.2. COMPACT PLANTING SOIL TO 80 PERCENT RELATIVE COMPACTION MINIMUM
- 9.3. DECORATIVE GRAVEL MULCH: 1/2-INCH LIGHT COLORED CRUSHED GRAVEL (DECORATIVE STONE SOLUTIONS "KETTLE", "CROWN GRANITE", OR "SANTA" ROSA")

ABBREVIATIONS

ASPHALT CONCRETE PAVEMENT

ASTM AMERICAN SOCIETY FOR TESTING AND MATERIALS

AVENUE BLVD BOULEVARD

BMP BEST MANAGEMENT PRACTICE

BELOW GROUND SURFACE CURB FACE

CAST IRON

CENTERLINE DISINTEGRATED GRANITE

LOS ANGELES DEPARTMENT OF WATER AND POWER

ELEVATION

EACH WAY

GTE GENERAL TELEPHONE AND ELECTRONICS CORPORATION

HIGH-DENSITY POLYETHYLENE

ID INSIDE DIAMETER

LACFCD LOS ANGELES COUNTY FLOOD CONTROL DISTRICT LADWP LOS ANGELES DEPARTMENT OF WATER AND POWER

LASAN LOS ANGELES SANITATION AND ENVIRONMENT LF LINEAR FEET

MAXIMUM MAINTENANCE HOLE

METRO ORANGE LINE

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

NOT TO SCALE

ON CENTER

OUTER DIAMETER **PSI** POUNDS PER SQUARE INCH

POLYVINYL CHLORIDE

SOUTH

SCG SOUTHERN CALIFORNIA GAS COMPANY

SCHEDULE

STREET **TBD** TO BE DETERMINED

WEST

FOR SAFE CLEAN WATER PROGRAM APPLICATION

NOT FOR CONSTRUCTION

THE PREPARATION OF THIS DRAWING HAS BEEN FINANCED IN PART THROUGH A GRANT FROM THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL TRANSIT ADMINISTRATION (FTA), UNDER THE FEDERAL TRANSIT ACT OF 1964, AS AMENDED. AND IN PART BY THE TAXES OF THE CITIZENS OF LOS ANGELES COUNTY AND OF THE STATE OF CALIFORNIA.

DESIGNED BY XXXXXXXX DRAWN BY XXXXXXXX CHECK BY XXXXXXXX IN CHARGE XXXXXXXX XX/XX/XXXX REV DATE BY APP REG. NO. EXPIRES SEAL HOLDER DESCRIPTION

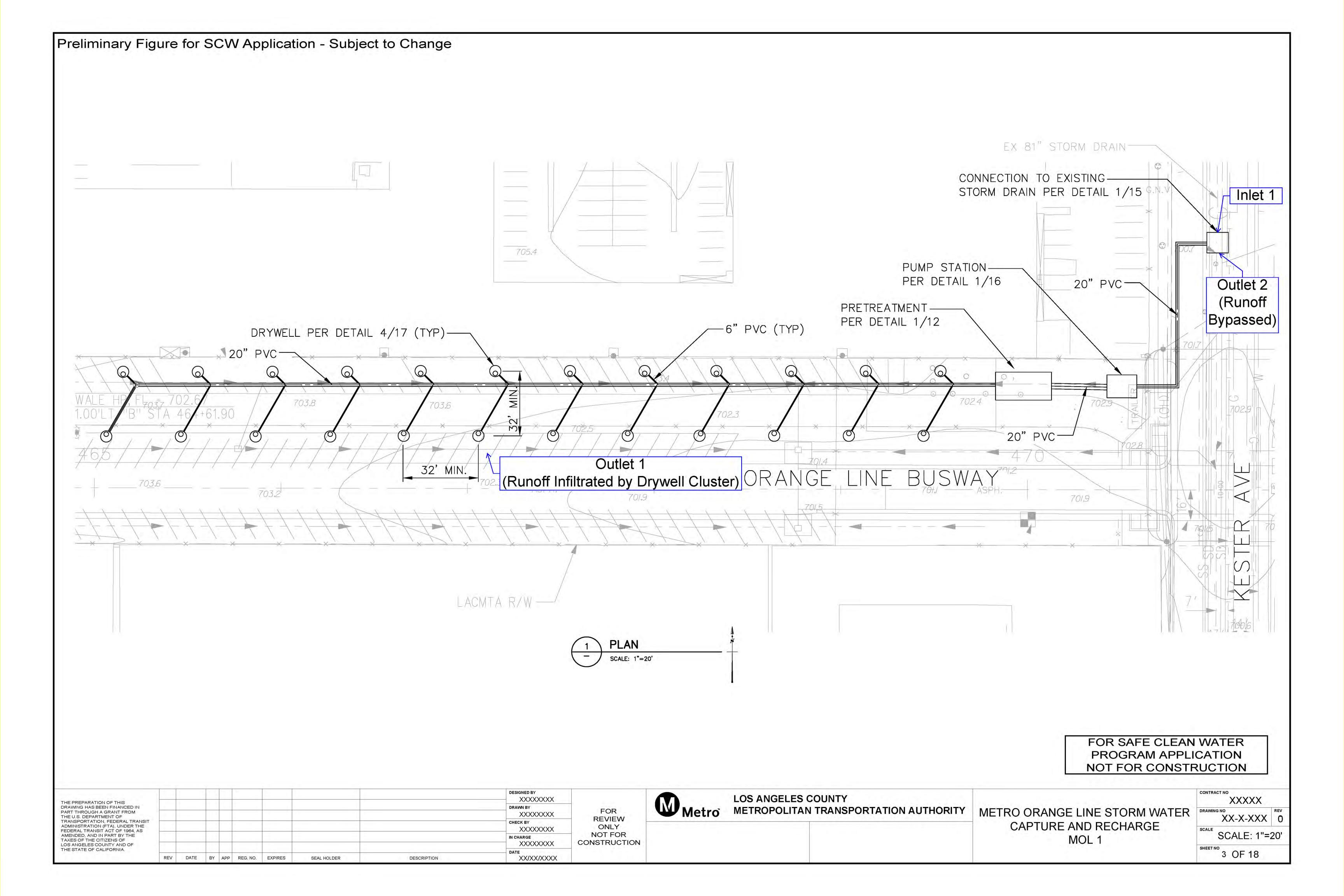
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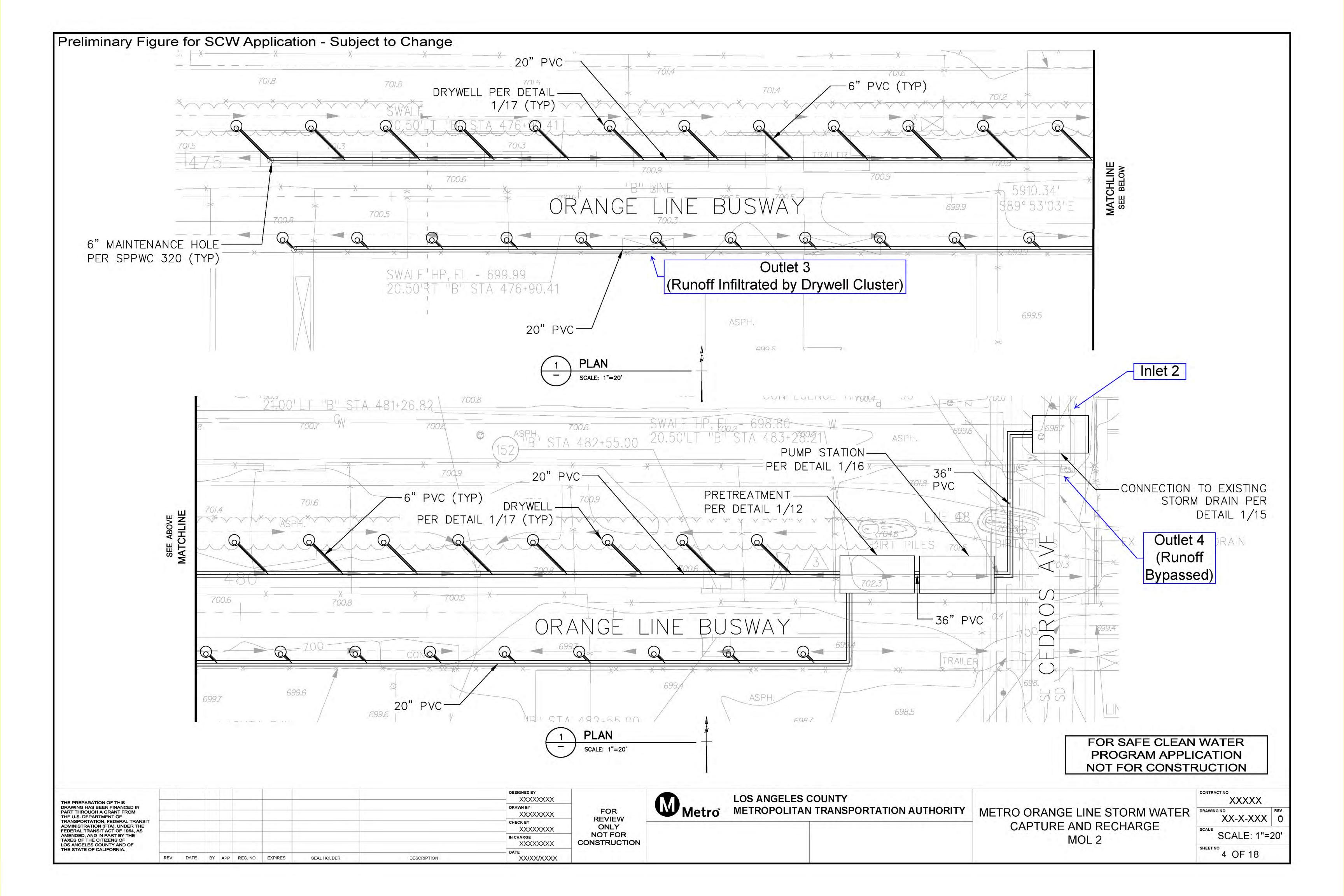


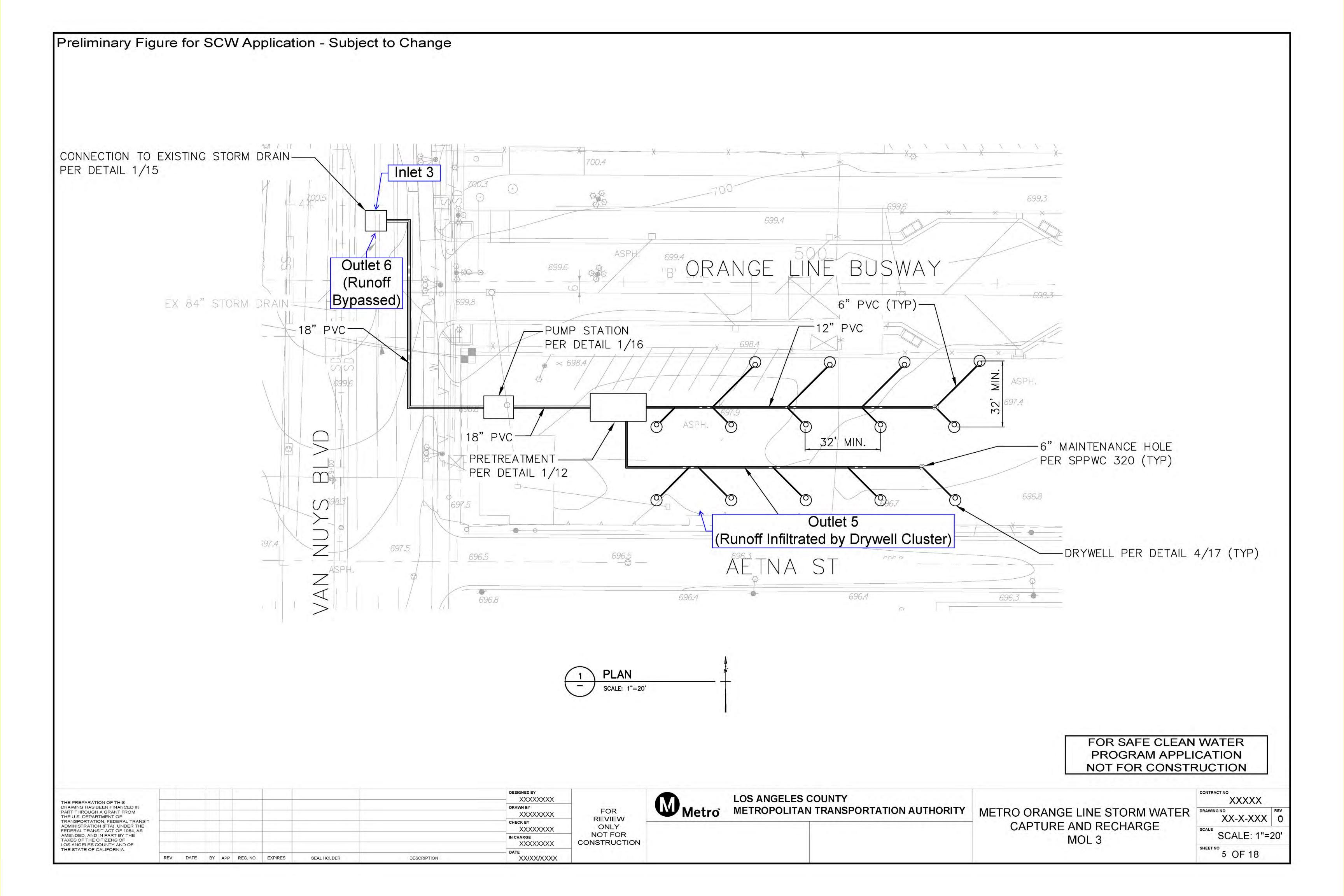
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

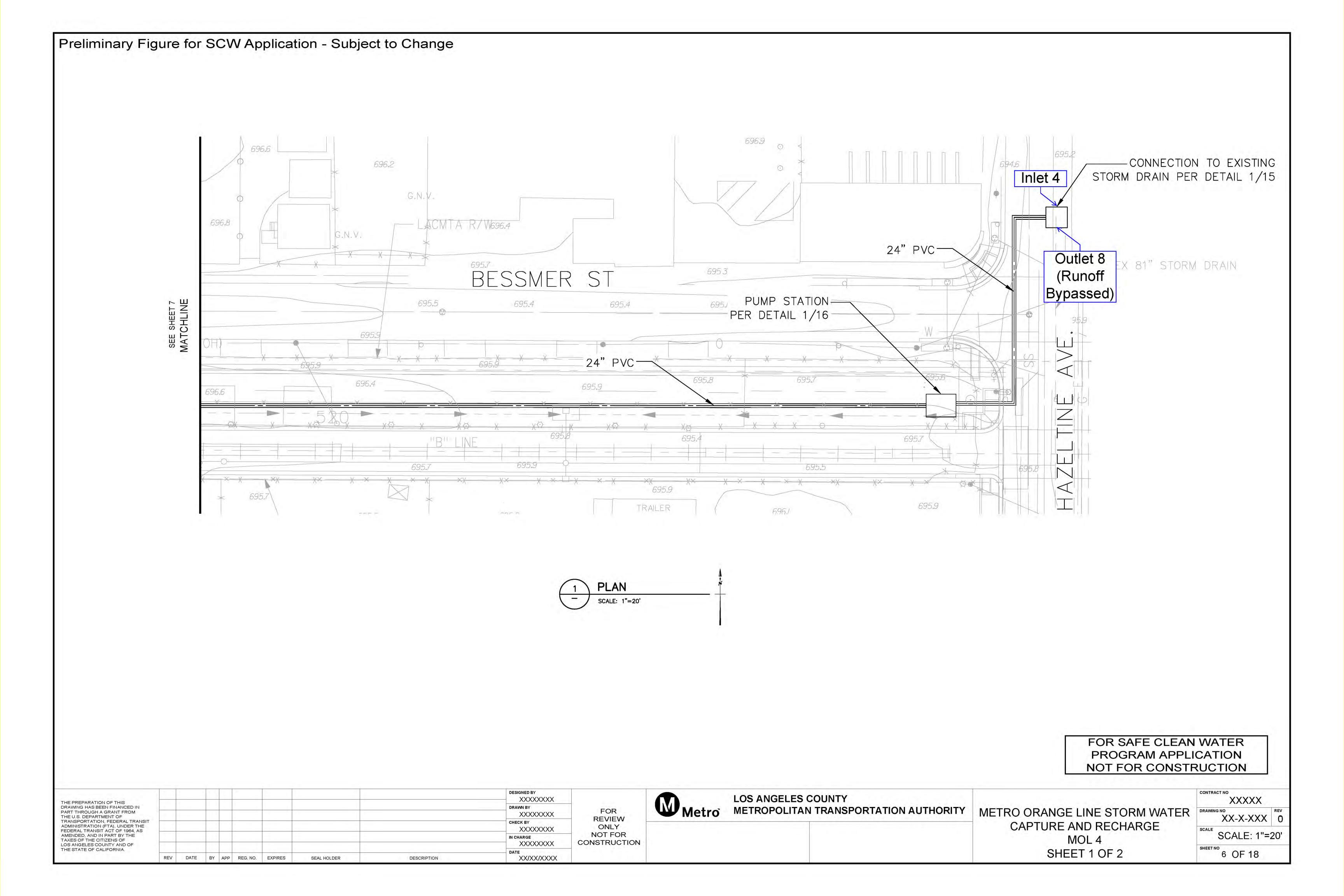
METRO ORANGE LINE STORM WATER CAPTURE AND RECHARGE NOTES, ABBREVIATIONS & SYMBOLS

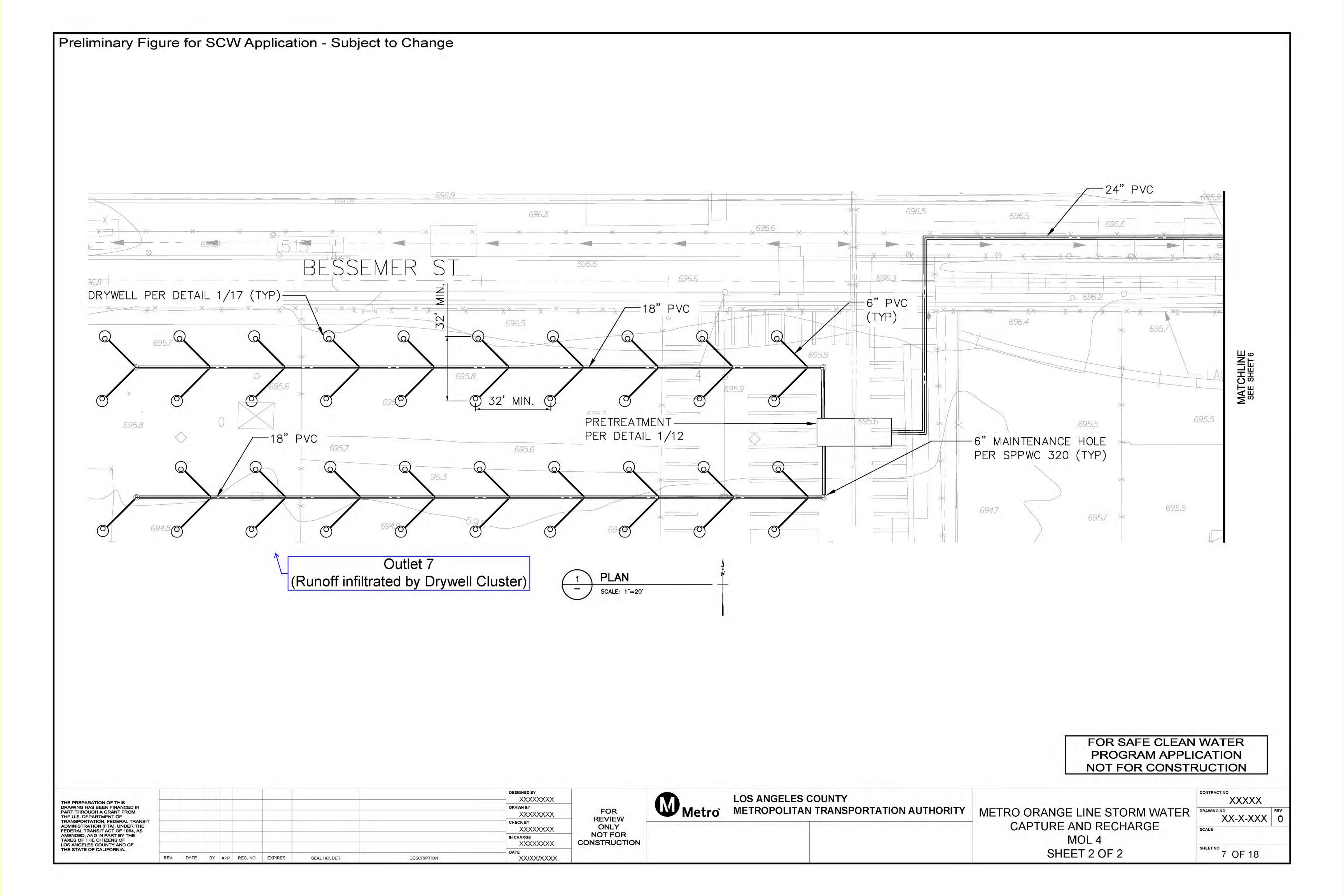
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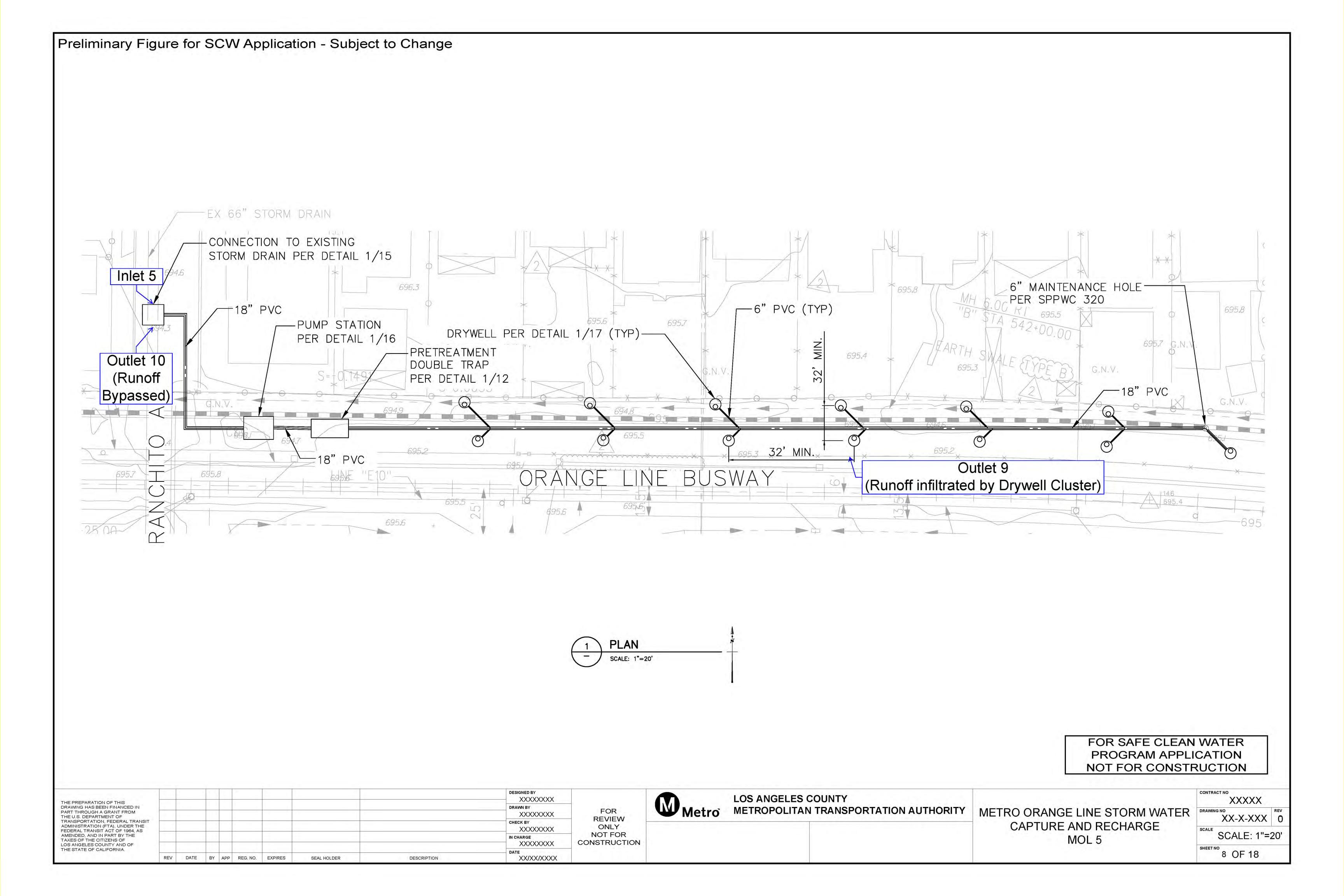


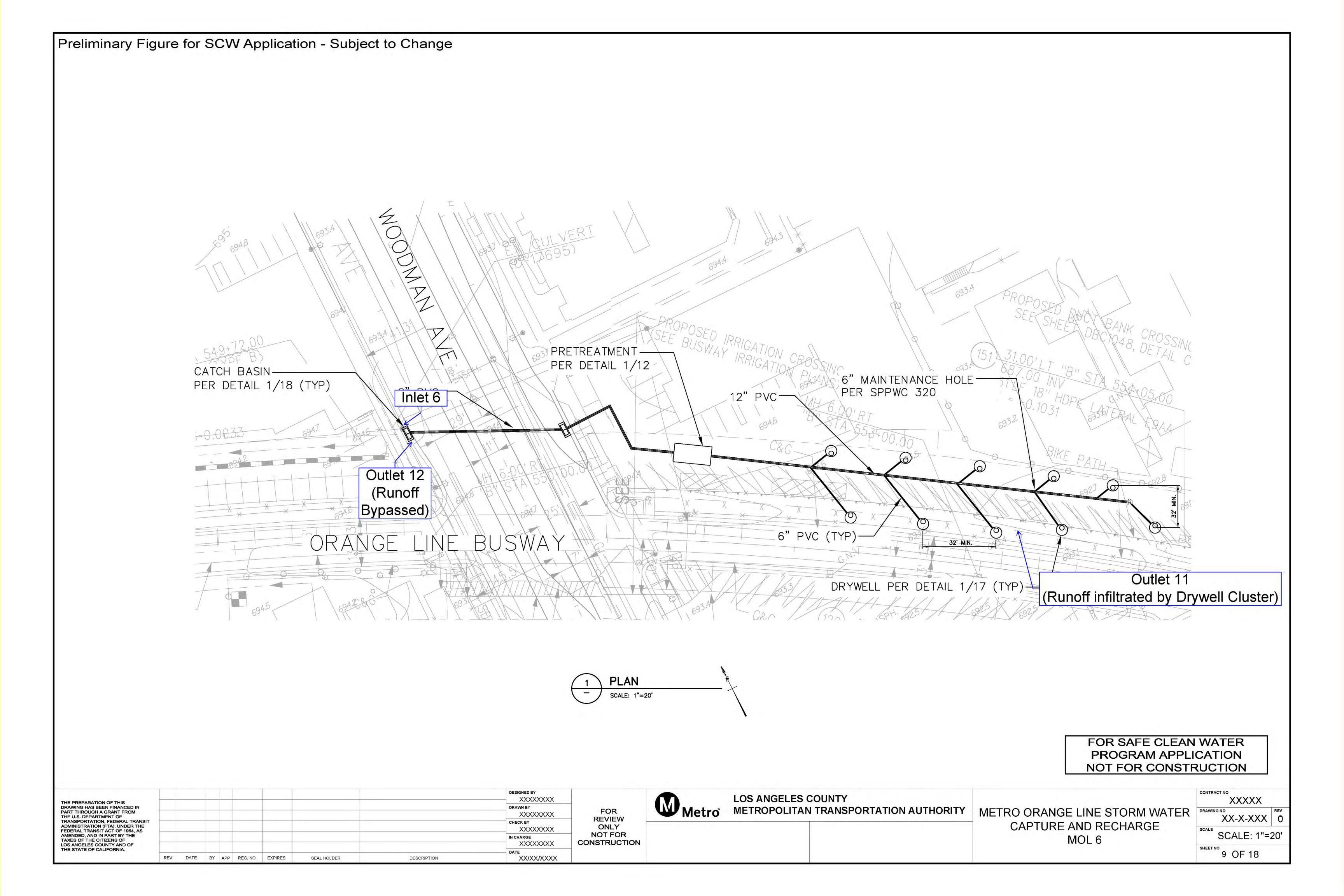


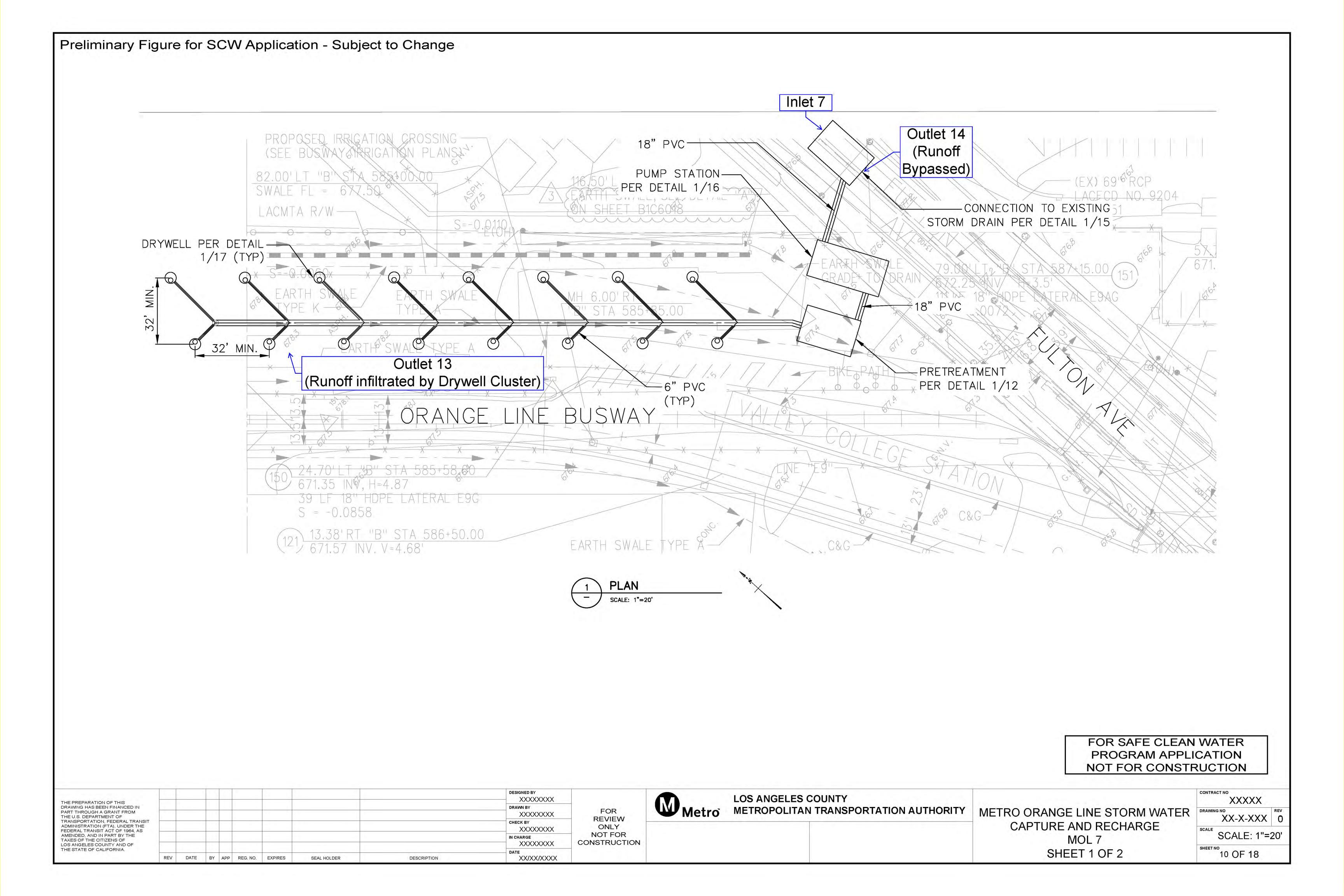


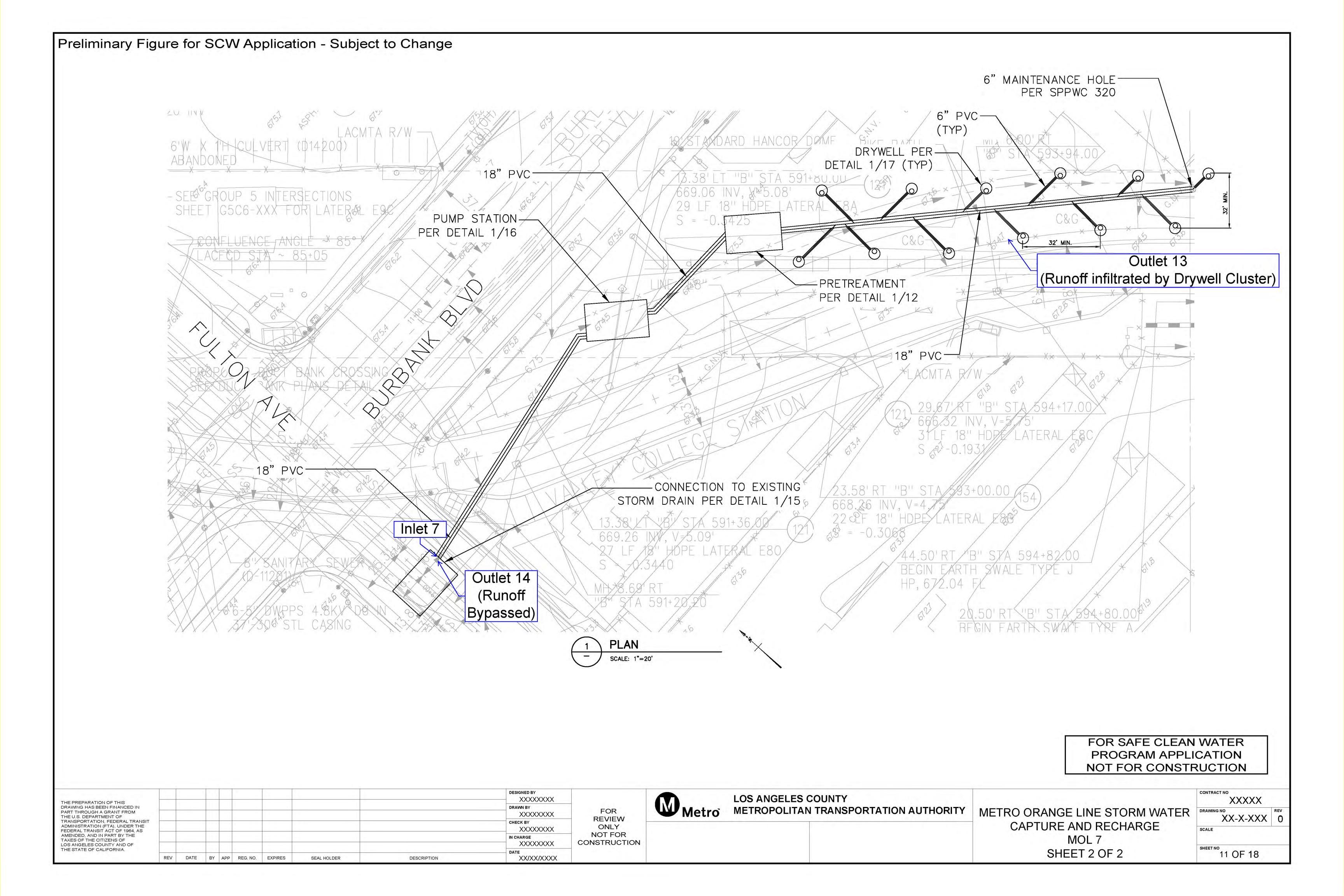


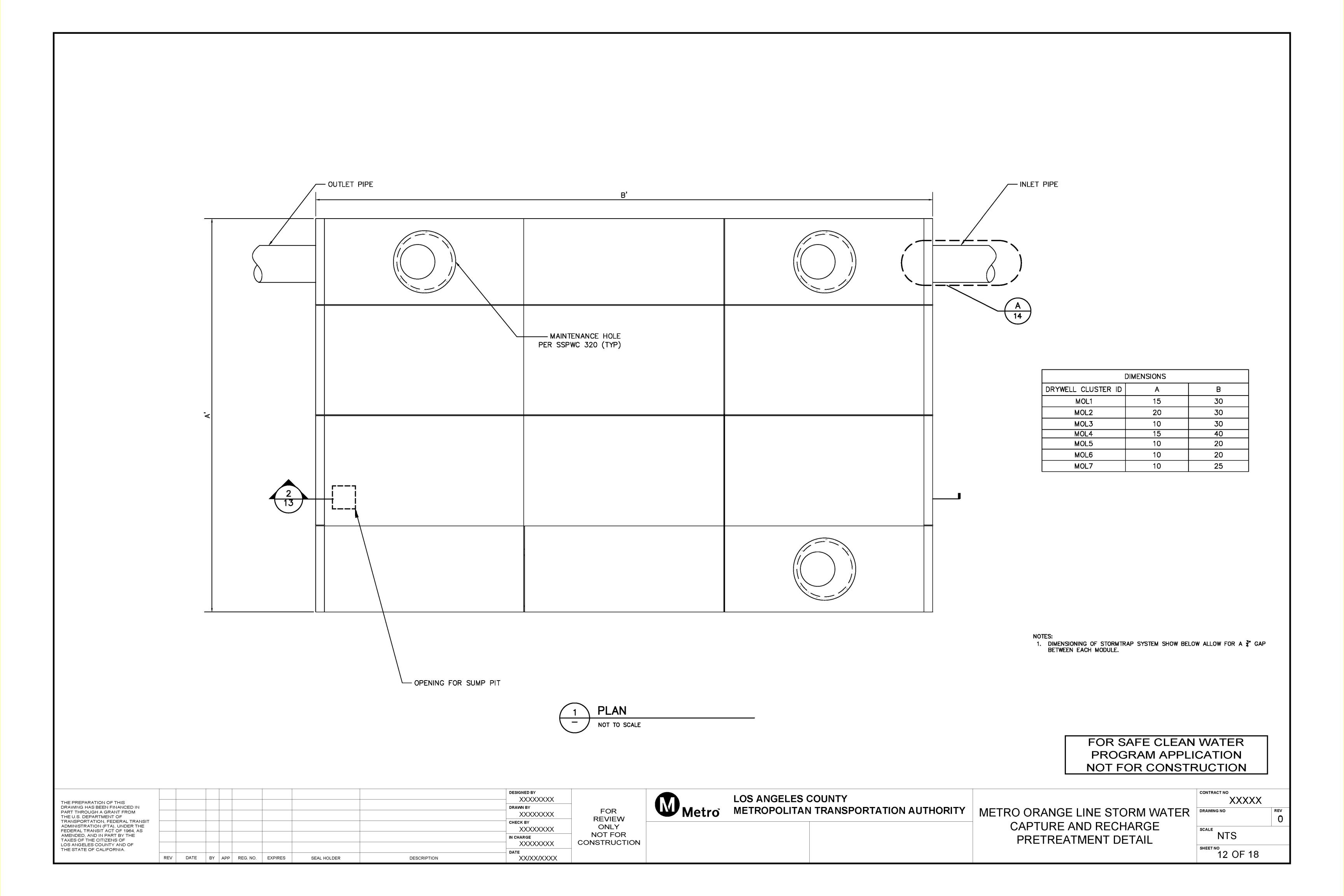


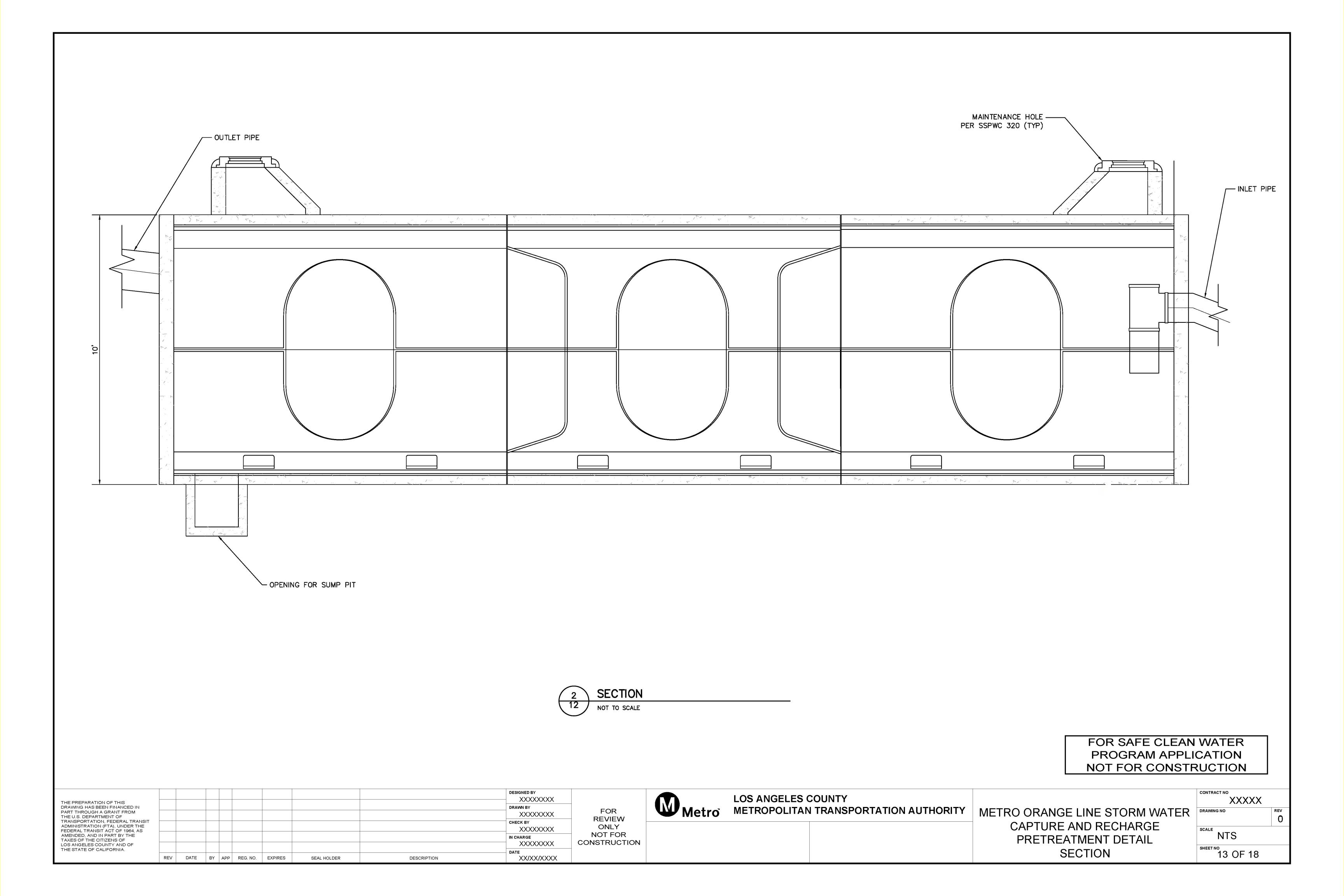


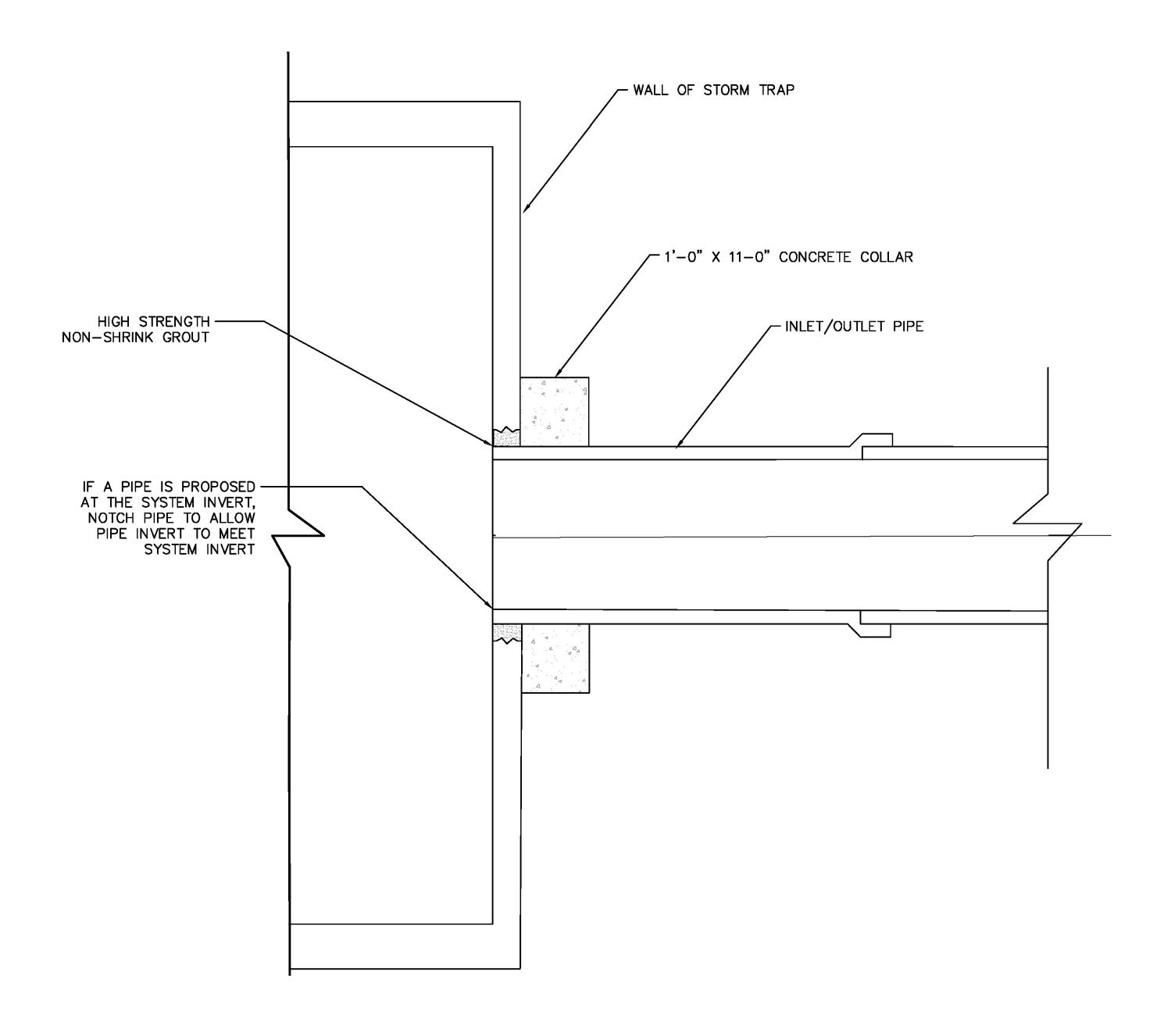














FOR SAFE CLEAN WATER PROGRAM APPLICATION NOT FOR CONSTRUCTION

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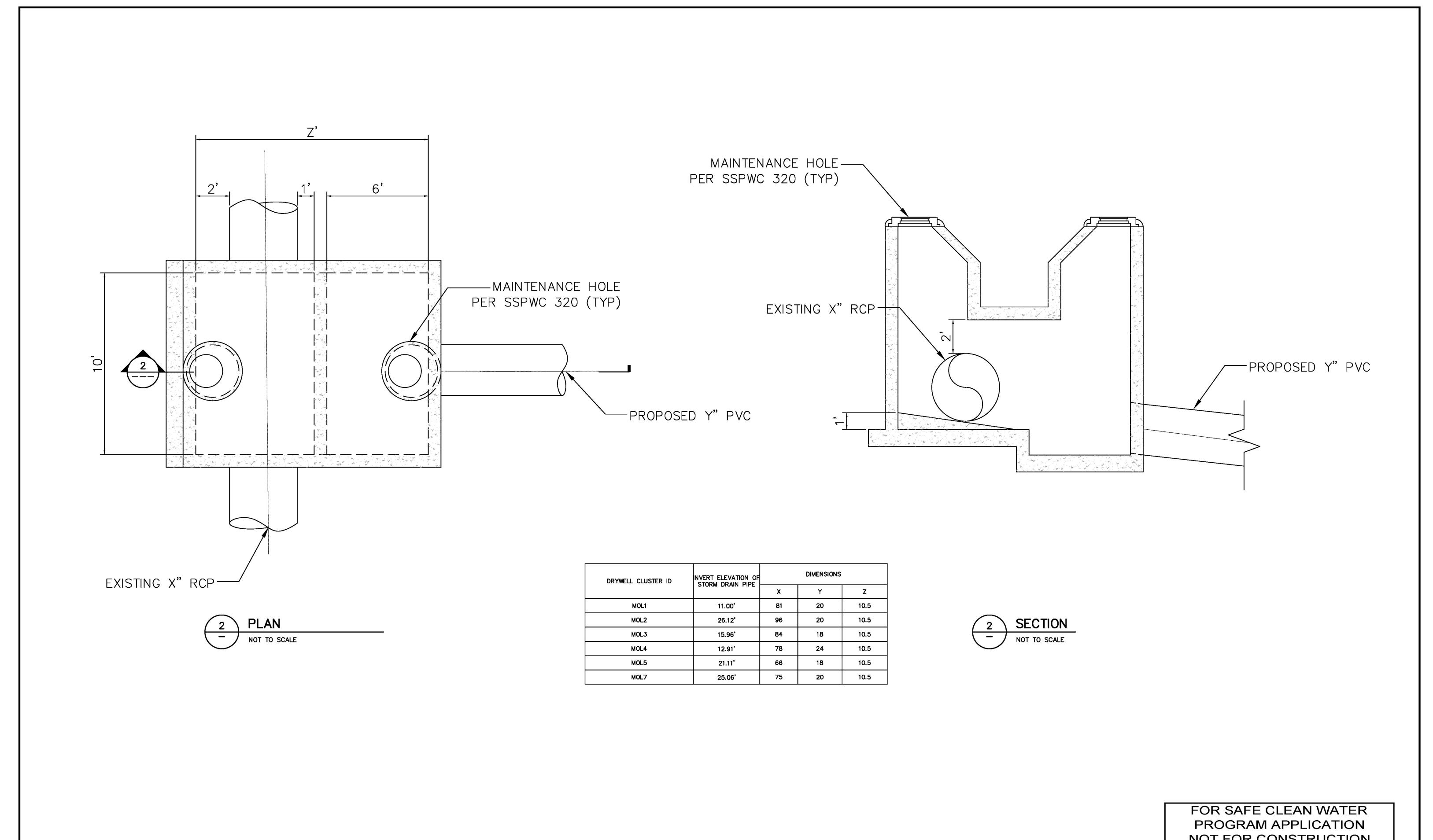
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METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
PRETREATMENT DETAIL

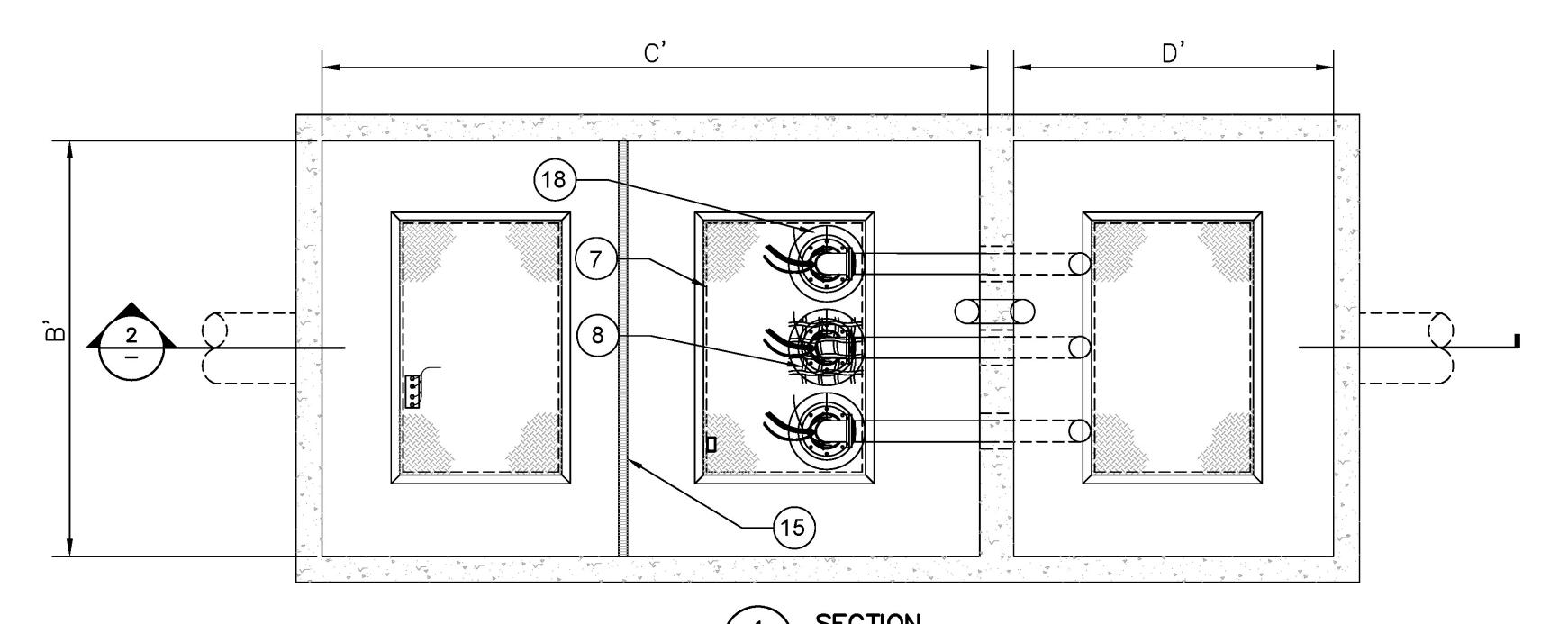
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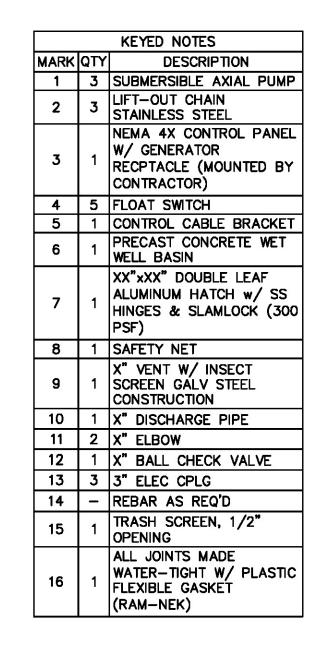


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CONTRACT NO

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THE STATE OF CALIFORNIA.	REV	DATE	: ВҮ	APP	REG	6. NO.	EXPIRES	SEAL HOLDER	DESCRIPTION	DATE XX/XX/XXXX									15 OF 18	3





SPECIFICATIONS

CONCRETE:

CLASS I/II CONCRETE WITH DESIGN STRENGTH
OF 4500 PSI AT 28 DAYS. UNIT IS OF
MONOLITHIC CONSTRUCTION AT FLOOR, FIRST
STAGE OF WALL AND BAFFLE WITH SECTIONAL
RISER TO REQUIRED DEPTH.

REINFORCEMENT:
GRADE 60 REINFORCED WITH STEEL REBAR
CONFORMING TO ASTM A615 ON REQUIRED
CENTERS OR EQUAL.

ALUMINUM HATCH:
300 PSF RATED, 1/4" ALUMINUM SKID—RESISTANT
FLOOR PLATE, STAINLESS STEEL TAMPERPROOF BOLTING
& HINGES & SLAMLOCK. (H—20 RATING OPTIONAL)

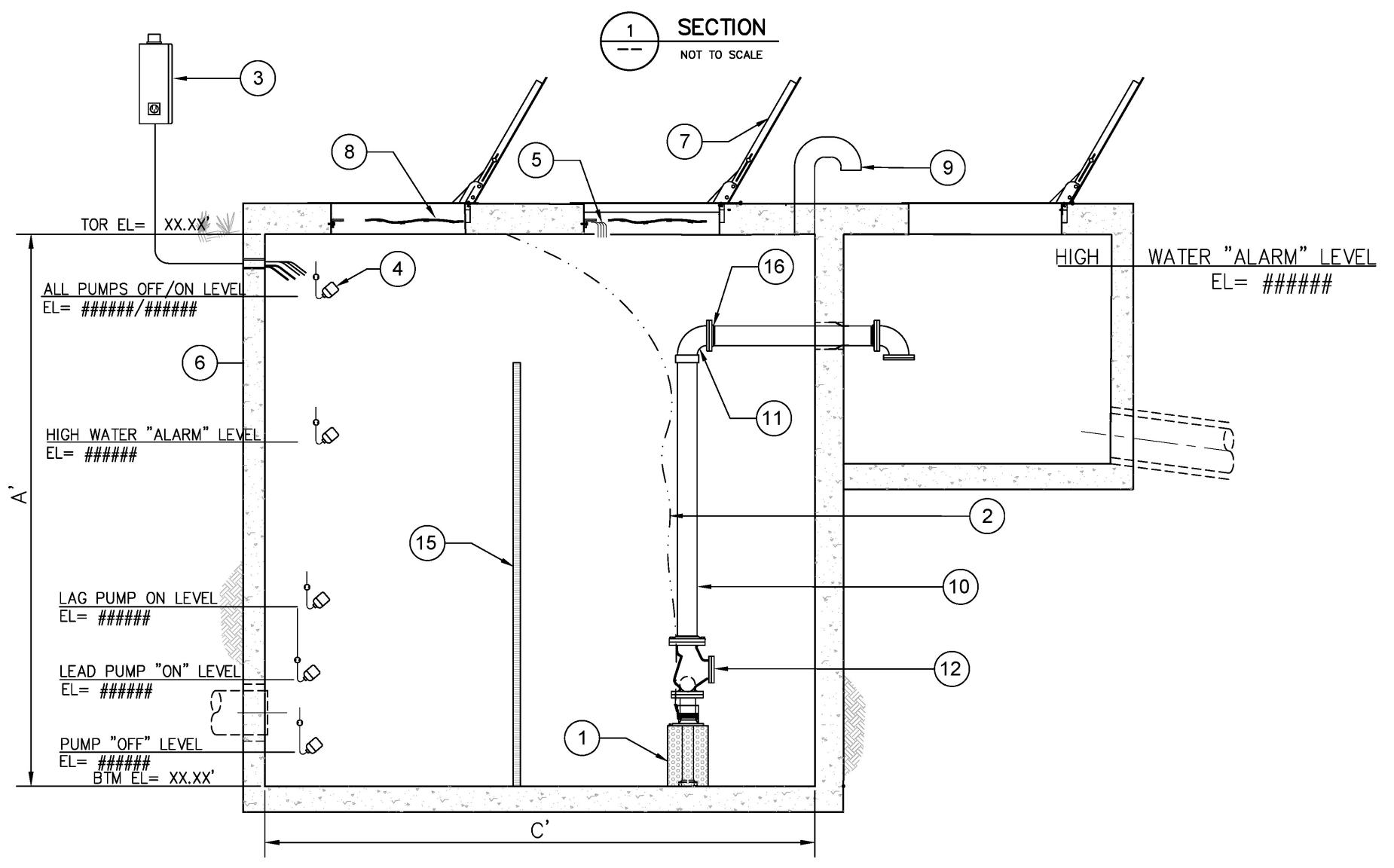
 PUMP No.
 TYPE
 GPM TDH RPM HP V PH Hz

 1
 AXIAL
 XXXXX XX' XXXXX XX XXX XX XXX
 XXXX XX XXX XX XXX XX XXX

 1
 AXIAL
 XXXXX XX' XXXX XX XXX XX XXX XX XX

CONTROLS:

PUMP CONTROLS SHALL BE MOUNTED INSIDE A UL LISTED NEMA-4X ENCLOSURE AND INCLUDE CIRCUIT BREAKERS, ALARM CIRCUIT FUSE, IEC RATED MOTOR STARTER, PUMP HOA, AND ALTERNATOR RELAY. PANEL SHALL HAVE A VISUAL ALARM BEACON. PANEL IS DESIGNED FOR REMOTE MOUNTING.



SECTION

NOT TO SCALE

STATION OPERATION LEVELS								
	RISING LEVEL CYC	LE						
WATER LEVEL ELEVATION	ACTION	PUMPS IN OPERATION						
XX.XX*	LEAD PUMP TURNS "ON"	LEAD PUMP "ON"						
XX.XX'	LAG PUMP TURNS "ON"	LEAD & LAG PUMPS "ON"						
XX.XX'	HIGH WATER "ALARM" LEVEL	LEAD & LAG PUMPS "ON" HIGH LEVEL						
XX.XX'	ALL PUMPS OFF/ON	CEAR LAN PUMPS "OFF"						
	FALLING LEVEL CY	CLE						
WATER LEVEL ELEVATION	АСПОМ	PUMPS IN OPERATION						
XX.XX'	PUMPS "OFF" LEVEL	ALL PUMPS "OFF" LAG PUMP SWITCHES TO LEAD PUMP						
XX.XX'	ALL PUMPS OFF/ON	LEAD & LAG PUMPS "ON"						

PUMPS TO ALTERNATE THRU ALL PUMPS ONLY 2 PUMPS RUN AT A TIME

DRYWELL CLUSTER ID		DIMENSIC	N		FLOW	# OF PUMPS	INVERT OF INCOMING PIPE
Sitting Section is	A	В	С	D	(GPM)	#	(FT)
MOL1	14	8	14.5	6	4,310	5	11
MOL2	29.12	8	22	6	7,164	8	26
MOL3	18.96	8	9.5	6	2,496	3	15.96
MOL4	15.91	8	22	6	7,004	8	12.91
MOL5	24.11	8	9.5	6	2,303	3	21.11
MOL7	28.06	8	9.5	6	5,029	3	25.06

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THE STATE OF CALIFORNIA.

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LOS ANGELES COUNTY
METROPOLITAN TRANSPORTATION AUTHORITY

METRO ORANGE LINE STORM WATER
CAPTURE AND RECHARGE
PUMP STATION DETAIL

CONTRACT NO

XXXXX

DRAWING NO

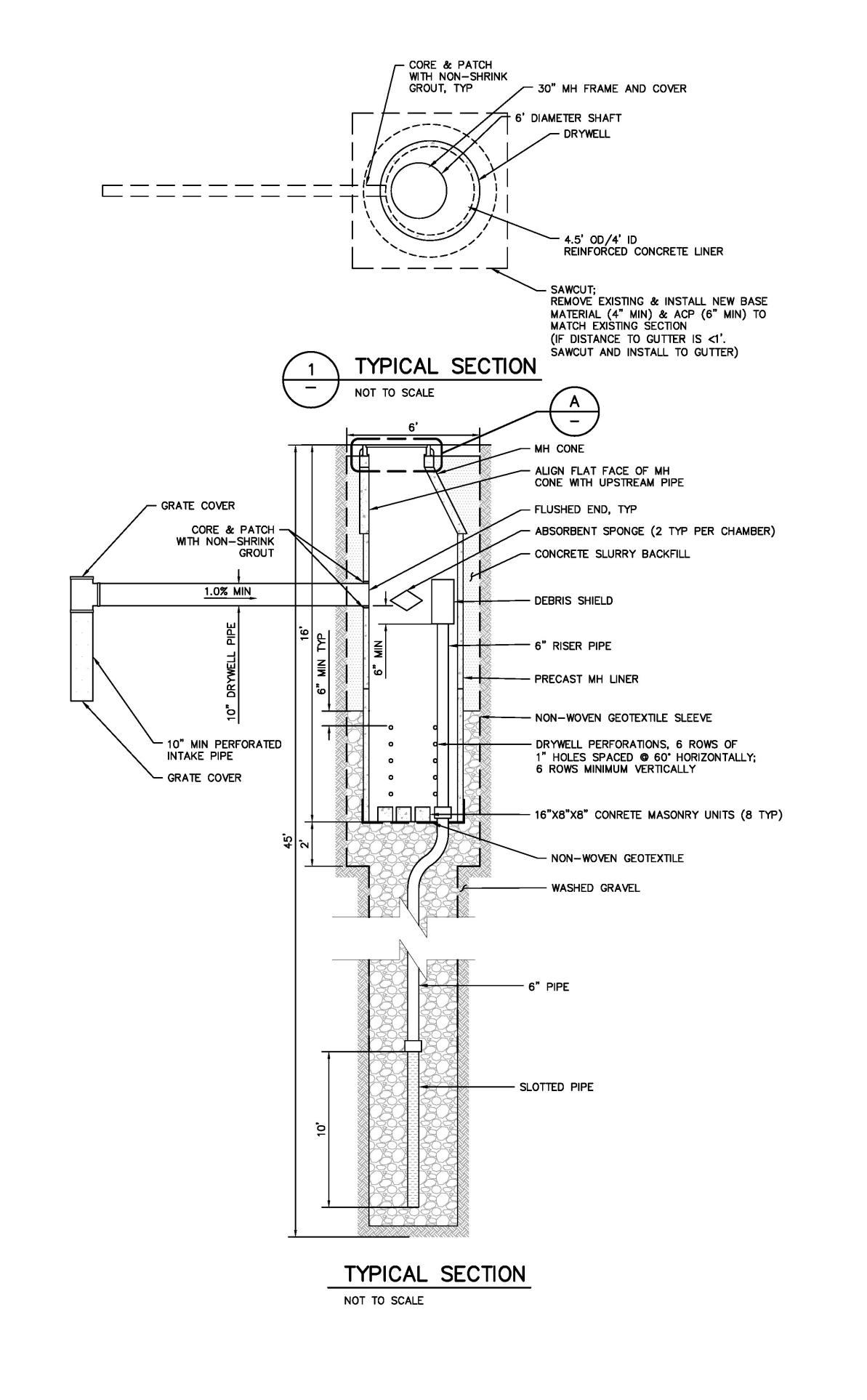
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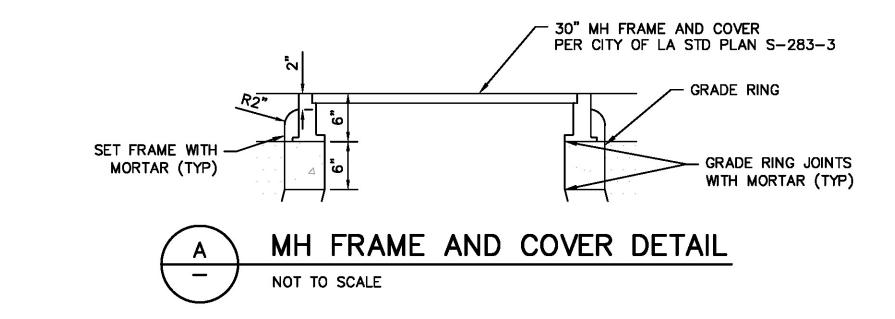
SCALE

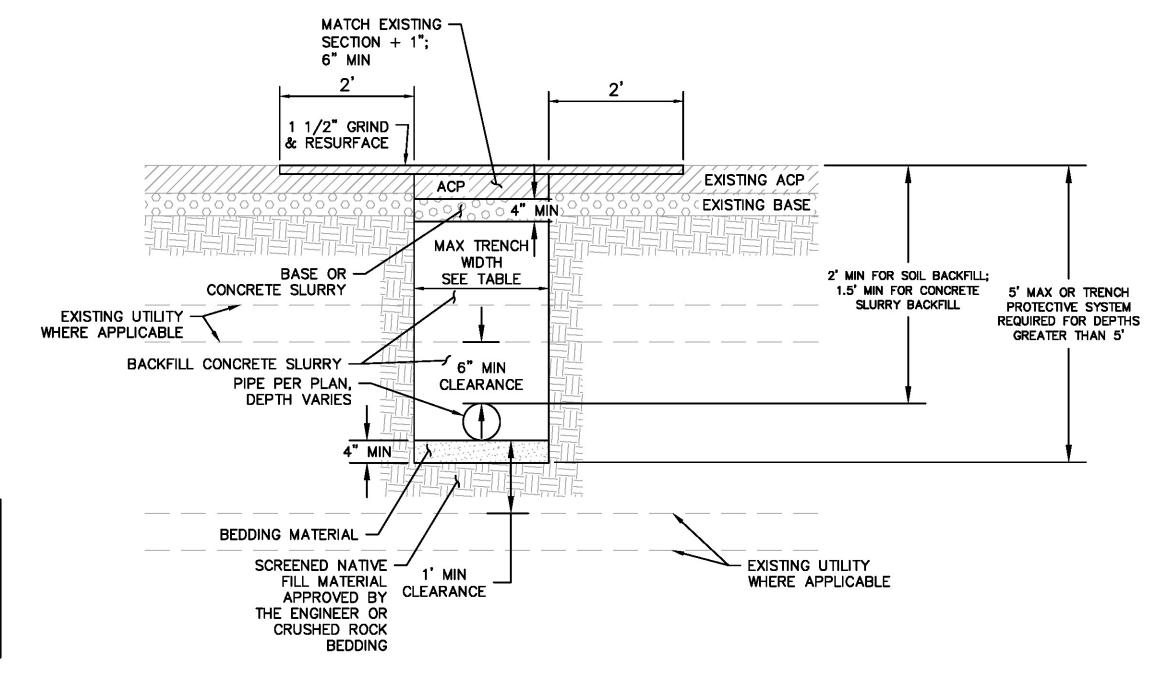
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SHEET NO

16 OF 18







TYPICAL TRENCH DETAIL

MAX TRENCH PIPE SIZE **WIDTH** 8" OR SMALLER 24" 10" OR 12" 30**"** 36" 15" 18" 42"

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REV DATE BY APP REG. NO. EXPIRES SEAL HOLDER	DESIGNED BY XXXXXXXX DRAWN BY XXXXXXXX CHECK BY XXXXXXXX IN CHARGE XXXXXXXXX DATE DESCRIPTION XX/XX/XXXX	FOR REVIEW ONLY NOT FOR CONSTRUCTION
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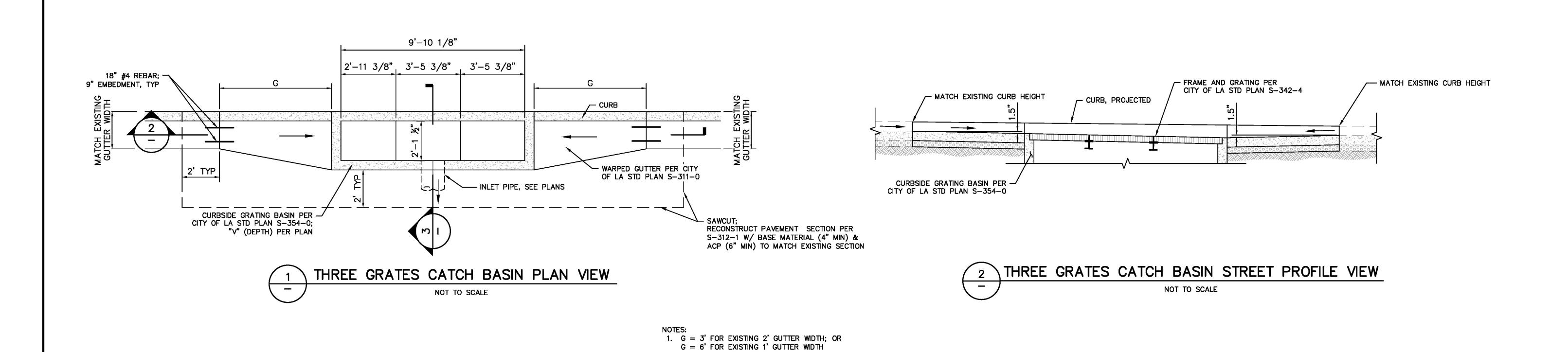


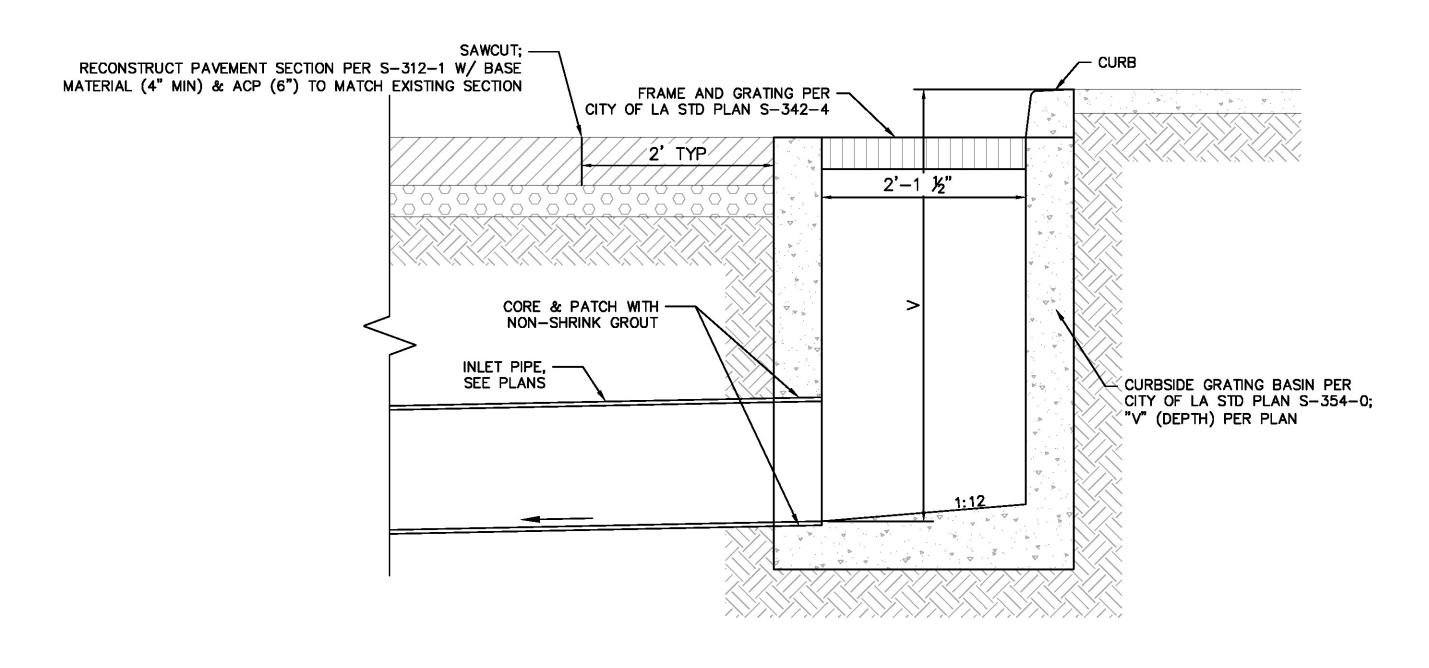
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

NOT TO SCALE

METRO ORANGE LINE STORM WATER CAPTURE AND RECHARGE DRYWELL & TRENCH DETAILS

0	CONTRACT NO XXXXX	
C	DRAWING NO XX-X-XXX	REV O
s	NTS	
S	17 OF 18	





CATCH BASIN PIPE PROFILE VIEW

NOT TO SCALE

FOR SAFE CLEAN WATER PROGRAM APPLICATION NOT FOR CONSTRUCTION

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ATTACHMENTS FOR SECTION 2.2:

CAPTURE AREA





engineers | scientists | innovators

Capture Area Delineation

Metro Orange Line Water Infiltration and Quality Project

1. INTRODUCTION

As part of the Safe Clean Water Program Feasibility Study for the Metro Orange Line Water Quality and Infiltration Project ("Project"), this attachment documents the methodology and output of the capture area delineation process, which supports the quantified water quality and water supply benefits presented in the main report.

Given the nature of the proposed distributed infiltration BMPs, the Safe Clean Water project module's built-in modeling component cannot be utilized. Instead, the modeling work was performed using Los Angeles County's Watershed Management System 2.0 (WMMS 2.0).

For the WMMS 2.0 model, the baseline LSPC model was modified by editing the subwatershed boundary and hydrologic response unit (HRU) parameters to simulate dry and wet weather runoff from the Project drainage areas ¹. The hydrologic response unit (HRU) within the revised subwaterhsed boundary was updated accordingly using the HRU raster downloaded from WMMS 2.0 website.

2. DRAINAGE AREA

Project drainage area overlaps with the WMMS subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861. The Project drainage area imperviousness used the HRU raster obtained from WMMS 2.0 data repository². It should be noted the WMMS 2.0 HRU categorization is defined in a finer resolution than the land use categorization used in the SCW Project Module. In absence of official grouping guidance, the WMMS 2.0 HRU was grouped into SCW Project Module land use classes as presented in Table 1. The HRU breakdown within the full Project drainage area is depicted in Figure 1.

Table 1. Breakdown of Impervious Acreage in Capture Area

SCW Project Module	WMMS 2.0	A	Acreage (ac)	Percent of Total	
Land Use Class	HRU	Pervious	Impervious	Total	Impervious Area
Commercial	Dev_Com	0	122	122	8.3%
Industrial	Dev_Ind	0	54	54	3.7%
Institutional	Dev_Inst	0	108	108	7.3%
Institutional	Dev_Roof	0	656	656	44.5%
Institutional Subtotal		0	764	764	51.9%
Multi Family Residential	Dev_ResHigh	0	82	82	5.6%
Secondary Roads and	Road_Primary	0	98	98	6.7%
Alleys	Road_Minor	0	189	189	12.8%
Secondary Roads and Alley	s Subtotal	0	287	287	19.5%

¹ Model input was developed and executed using LSPC v6.0 provided in the WMMS 2.0 application package

October 2020

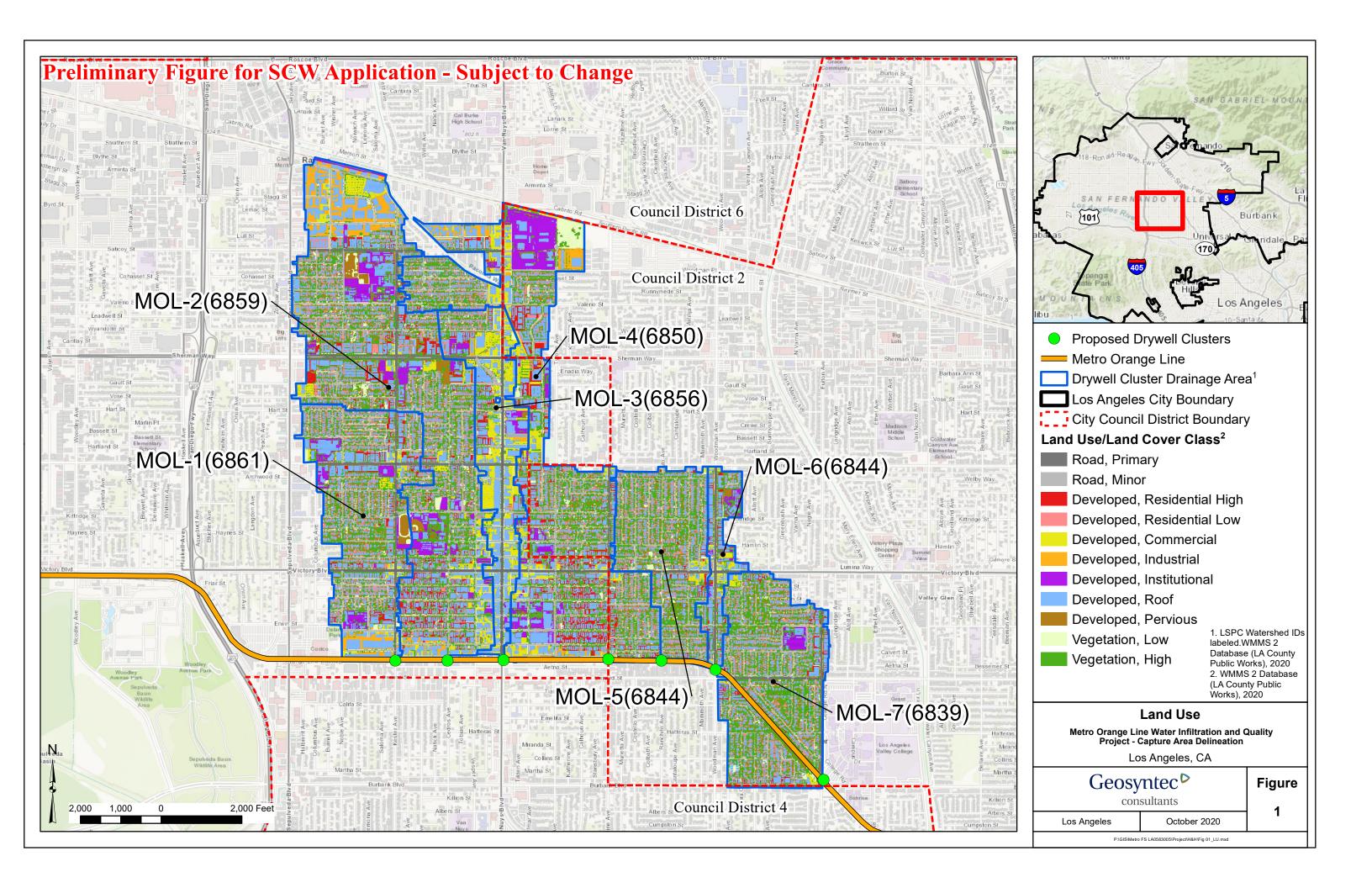
Capture Area Delineation 1

² https://portal.safecleanwaterla.org/wmms/downloads

SCW Project Module Land Use Class	WMMS 2.0 HRU	Acreage (ac)			Percent of Total
		Pervious	Impervious	Total	Impervious Area
Single Family Residential	Dev_ResLow	0	149	149	10.1%
Urban Open Space	Dev_Irrigated	59	0	59	n/a
	Dev_Overspray	0	14	14	0.9%
	Dev_Pervious	166	0	166	n/a
Urban Open Space Subtotal		225	14	239	0.9%
Vacant	Veg_High	494	0	494	n/a
	Veg_Low	127	0	127	n/a
Vacant Subtotal		621	0	621	0%
Grand Total		846	1,473	2,319	100%

FIGURE

Capture Area Delineation October 2020





ATTACHMENTS FOR SECTION 2.4:

SITE CONDITIONS & CONSTRAINTS





engineers | scientists | innovators

Geotechnical Review

Metro Orange Line Water Infiltration and Quality Project

1 INTRODUCTION

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement infiltration best management practices (BMPs) within Los Angeles County Metropolitan Transportation Authority (LA Metro) parcels and right-of-way (ROW) in the San Fernando Valley area of City of Los Angeles. The purpose of the Project is to capture and infiltrate stormwater runoff, to improve downstream water quality, help recharge the groundwater basin, and mitigate localized nuisance flooding in disadvantaged communities and neighborhoods with significant unmet needs within the neighboring geographical area. Drywells and associated pretreatment facilities are the primary type of infiltration BMPs proposed for this Project. To support the Project's Safe Clean Water Program application, data from both recent subsurface investigations and publicly available desktop information were used to evaluate constraint to assesses the feasibility and potential geotechnical constraints. Summary of findings are provided in this attachment.

2 SITE CONDITION

2.1 Surface Condition

The existing site consists of parking lots, paved roads, and vegetated parkways along Metro Orange Line ROW between Kester Avenue and Fulton Avenue. The area drains to the south (Figure 1) with a slight gradient and an approximate average elevation of 760 ft. USGS topographic data show slopes of less than five percent throughout the Project site. According to the Los Angeles Department of Building and Safety (LADBS) Guidelines for Stormwater Infiltration (LADBS, 2017), stormwater infiltration facilities must be placed at locations with a gradient less than 20 percent (5:1 horizontal to vertical). Therefore, the proposed infiltration BMPs are not anticipated to contribute to slope instability.

2.2 Subsurface Soils and Hydraulic Conductivity

Subsurface soil properties and hydraulic conductivity were characterized and estimated based on a comprehensive review of the following geologic, topographic, and geotechnical information:

- 1. NRCS Hydrologic Soil Groups (Figure 2);
- 2. Los Angeles County Soil Classes (Figure 3);
- 3. Regional Geologic Map (Figure 4)¹;
- 4. Available boring logs and cone penetration test (CPT) results collected as part of the MOL BRT Improvement Project (Appendix A). Locations of reviewed CPT and boring logs are shown in Figure 5;

Geotechnical Review 1 October 2020

¹ Figure obtained from MOL BRT Improvement Project 30% Geotechnical Memo (Wood, 2020)

- 5. Available boring logs nearby the Project provided by drywell vendors (Appendix B); and
- 6. CPT results collected by Geosyntec Consultants at Victory Green Stormwater Infrastructure Project, which is a nearby stormwater capture project that also relies on drywells as the primary BMP type (Appendix C). Locations of reviewed CPT and boring logs are shown in Figure 5;

As shown in Figure 2 through 4, the Project site overlaps geologic unit QyF (Young alluvial fan deposits). The soils throughout the Project site are classified as Hydrologic Soil Groups A and B, and Los Angeles County Soil Class Number 5, 8, and 15, which are associated with silty sand, sandy loam, and silt loam. Hydraulic conductivity was developed from the selected CPT and boring log information based on published correlations between CPT data and soil descriptions and hydraulic conductivity. The average and standard deviation of hydraulic conductivity between 16 and 50 ft below ground surface (bgs) from all reviewed sites was used to compute the design hydraulic conductivity. Summaries of hydraulic conductivity for Project site are shown on Figure 6. As shown in the figure, the average and standard deviation of bulk hydraulic conductivities between 16 and 50 ft bgs is 7.6E-04 ft/sec and 4.01E-04 ft/sec, respectively.

Drywell infiltration rates were computed based on the average hydraulic conductivity using the United States Bureau of Reclamation (USGR) equation². Other data sources in the area were considered to help validate these drywell infiltration rate estimates. A reasonable safety factor was applied such that the drywell infiltration rate is calculated based on the previously computed average hydraulic conductivity minus 1 standard deviation (7.6E-04 ft/sec – 4.0E-04 ft/sec = 3.6E-04 ft/sec). The resultant drywell infiltration capacity is 0.8 cfs. The detailed calculation procedure can be found in Appendix D.

2.3 Groundwater

The Project is above the San Fernando Valley Groundwater Basin (SFVGB), which is an unconfined groundwater aquifer in the Upper Los Angeles River (ULAR) Watershed Area. According to the Los Angeles Department of Water and Power (LADWP), SFVGB is of concern to local municipal agencies due to its recent decline in groundwater level, which is assumed to be heavily influenced by urbanization, causing runoff to leave the basin rather than infiltrating (ULAR WMG, 2020). SFVGB has four existing beneficial uses outlined in the Regional Water Quality Control Board Basin Plan for Los Angeles County, which include: municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply (2014).

Concerning depth to groundwater, the historically highest groundwater contours from the Van Nuys, Burbank, San Fernando, and Sunland Quadrangles (California Department of Mines and Geology, Plate 1.2, 1997, 1998) were examined; see Appendix F for Plate 1.2. The historically highest groundwater contours at the proposed drywell locations range from 15 to 100 ft bgs.

² For more information on the formula and applicability of USBR formula please see https://www.usbr.gov/tsc/techreferences/mands/mands-pdfs/DrainMan.pdf

Information obtained or deduced from more recent borings (2019 and 2020), however, indicate groundwater table depths that are well in excess of 15 ft bgs near the southern drywell clusters shown on Plate 1.2. To demonstrate this, Plate 1.2 was overlain with more recent borehole data; see Figure 5. As shown in the figure, boring logs within or immediately adjacent to the Project site show groundwater depth of at least 70 feet bgs according to data collected since 2019. The proposed depth of the drywells is 45 ft. Therefore, the bottom of the proposed drywell is more than 10 ft above the top of the groundwater table, consistent with the LADBS Guidelines for Stormwater Infiltration (LADBS, 2017). This indicates that the existing conditions are suitable for drywell installation. Reviewed boring logs for groundwater depth investigation are included in Appendix G.

2.4 Geophysical Category

The City of Los Angeles analyzed geophysical characteristics in the LADWP Stormwater Capture Master Plan (SCMP) for the purpose of implementing stormwater BMPs throughout the City of Los Angeles. The analysis defined areas within the City of Los Angeles as geophysical category A, B, or C. Categories were determined based on a combination of infiltration obstacles, such as susceptibility to landslides, depth to groundwater, slope, hydrologic soil group, geology, aquifer, and liquefaction potential.

The proposed drywells are within geophysical category A, as shown in Figure 7.

Geophysical category A is defined in the SCMP as "areas [that] have no obstacles to infiltration, infiltrative soils, pervious geology, and overlie the highest priority aquifers. They are very conducive to infiltration BMPs" (City of LA DWP, 2013). Therefore, the proposed BMPs are not anticipated to encounter any geophysical obstacles to infiltration.

3 GEOLOGIC HAZARDS

According to the LADBS Guidelines for Stormwater Infiltration, the feasibility of the proposed Project was evaluated for consideration of potential liquefaction and seismic settlement, surcharge on adjacent structures, and soil expansiveness (LADBS, 2017). These hazards were assessed using data from local geotechnical borings, site-specific geotechnical investigations, and publicly available information on geologic hazard zones. Findings are presented in the following sections.

3.1 Liquefaction and Seismic Settlement

Important seismic considerations in Southern California include surface rupture along faults, ground shaking, landslide potential, and liquefaction. A review of the United States Geological Survey (USGS) Quaternary Faults indicates that the risk of surface rupture impacting the Project is low. The highest risk is ground shaking, although as drywells are relatively light, subsurface, and are not load-bearing, the probability of catastrophic failure is low.

The Project site is relatively flat with an approximate average elevation of 760 ft. As shown in Figure 8, the proposed infiltration BMPs are not located in identified area that pose risk of potential landslide.

As shown in Figure 8, a fraction of the proposed infiltration BMPs are located within a mapped Liquefaction Zone. Liquefaction is a condition where high excess pore water pressure develops in partially or fully saturated soil (generally loose, saturated, and cohesionless soils) as a result of earthquake loading. When the shear stress required for the equilibrium of a soil mass is greater than the shear strength of the soil in its liquefied state, the soil loses a large portion of its shear resistance, as the effective stress of the soil goes to zero, causing a liquid-like response.

Research on historical and recent groundwater depth are summarized in Figure 5. Although reported historical high groundwater elevations in the Project site area are between approximately 15 and 20 feet bgs, more recent data indicate that the top of the groundwater table beneath the site is typically more than 77 ft bgs. Since the drywells will be 45-feet deep, a minimum 32-ft separation between the bottom of the well and the top of the groundwater table would be present. As a result, water infiltrated through the proposed drywells is not anticipated to significantly raise the groundwater elevation, and a separation of more than 10 feet between the bottom of the drywells and the groundwater table is expected. On this basis, the proposed drywells are not expected to significantly increase the risk of liquefaction to the adjacent existing improvements. In addition, the proposed drywells are relatively lightweight and are not critical facilities, therefore, although liquefaction may cause some damage to the drywells it would not lead to a safety concern to the public.

The proposed drywells and associated pretreatment facilities are relatively lightweight and therefore significant static settlement is not anticipated. Seismic settlement can occur with or without liquefaction; it results from densification of loose soils. However, because of the lightweight nature of the drywells and lack of shallow groundwater, the potential for significant seismic settlement at the site is considered low. According to the site-specific analysis conducted as part of the Metro Orange Line Improvement geotechnical investigation (see Appendix F), the total and differential liquefaction-induced settlements are less than 1 inch and 0.5 inches respectively. These values are less than the allowable total and differential liquefaction-induced settlement of 1.5 inches and 0.75 inches, respectively, according to the LADBS Guidelines for Stormwater Infiltration (LADBS, 2017).

3.2 Surcharge on Adjacent Structures

Proposed drywells and associated pretreatment facilities are not anticipated to place an increased surcharge on adjacent structures or foundations. Due to the relatively flat slopes, soil retaining structure are not known to be located near the proposed infiltration BMPs, therefore any potential increase in pore water pressure should not be a concern.

The proposed drywells will be located at least 10 feet from adjacent buildings to comply with the LADBS Guidelines for Stormwater Infiltration (LADBS, 2017).

3.3 Expansive Soil

Soils beneath the site are generally poorly graded sands and gravels with occasional thinly bedded silts and clays. Therefore, expansive soils are not anticipated to impact the proposed improvements. If expansive soils are encountered during grading or construction, the geotechnical engineer of the team will provide additional recommendations as appropriate.

4 POTENTIAL GROUNDWATER CONTAMINATION

Based on review of the Geotracker database and EDR report, there are active remediation efforts on volatile organic compounds and non-petroleum hydrocarbons within 0.5 miles of the proposed BMP sites. No significant contaminant plume was identified beneath the proposed BMP sites. Therefore, the risk of the proposed BMP introducing additional contaminants into the San Fernando Valley Groundwater Basin is low.

A comprehensive review of Geotracker and EDR reports can be found in Appendix H.

5 SUMMARY OF FINDINGS

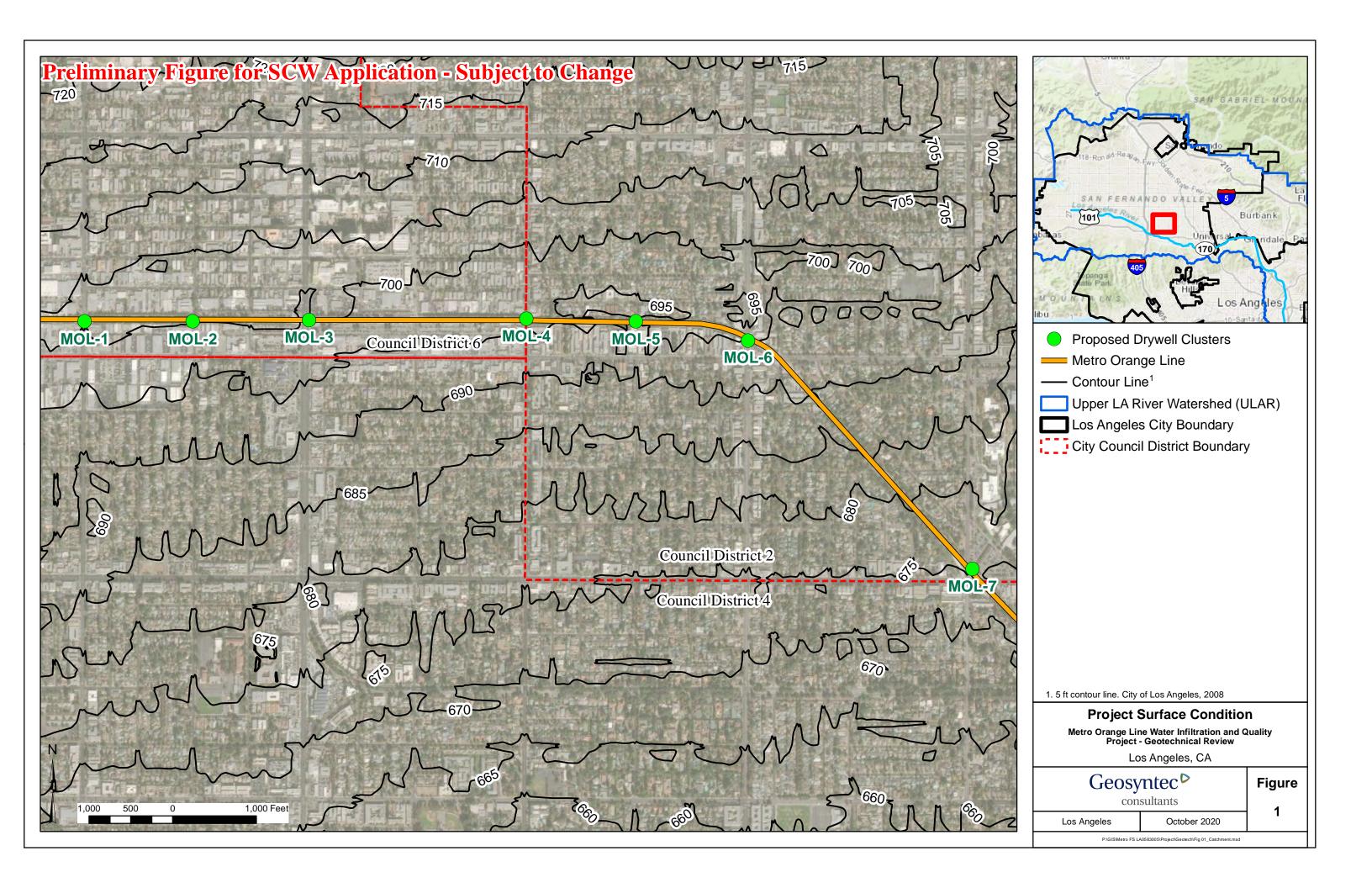
The subsurface conditions of the proposed Project site are conducive to infiltration BMPs since the underlying soils are predominantly sandy in nature, generally classified as either Hydrologic Soil Group A or B, have substantial depth to groundwater, have favorable infiltration rates, and mitigated risk to liquefaction. Therefore, this review of geotechnical conditions indicates that implementation of the proposed infiltration BMPs is feasible throughout the Project area.

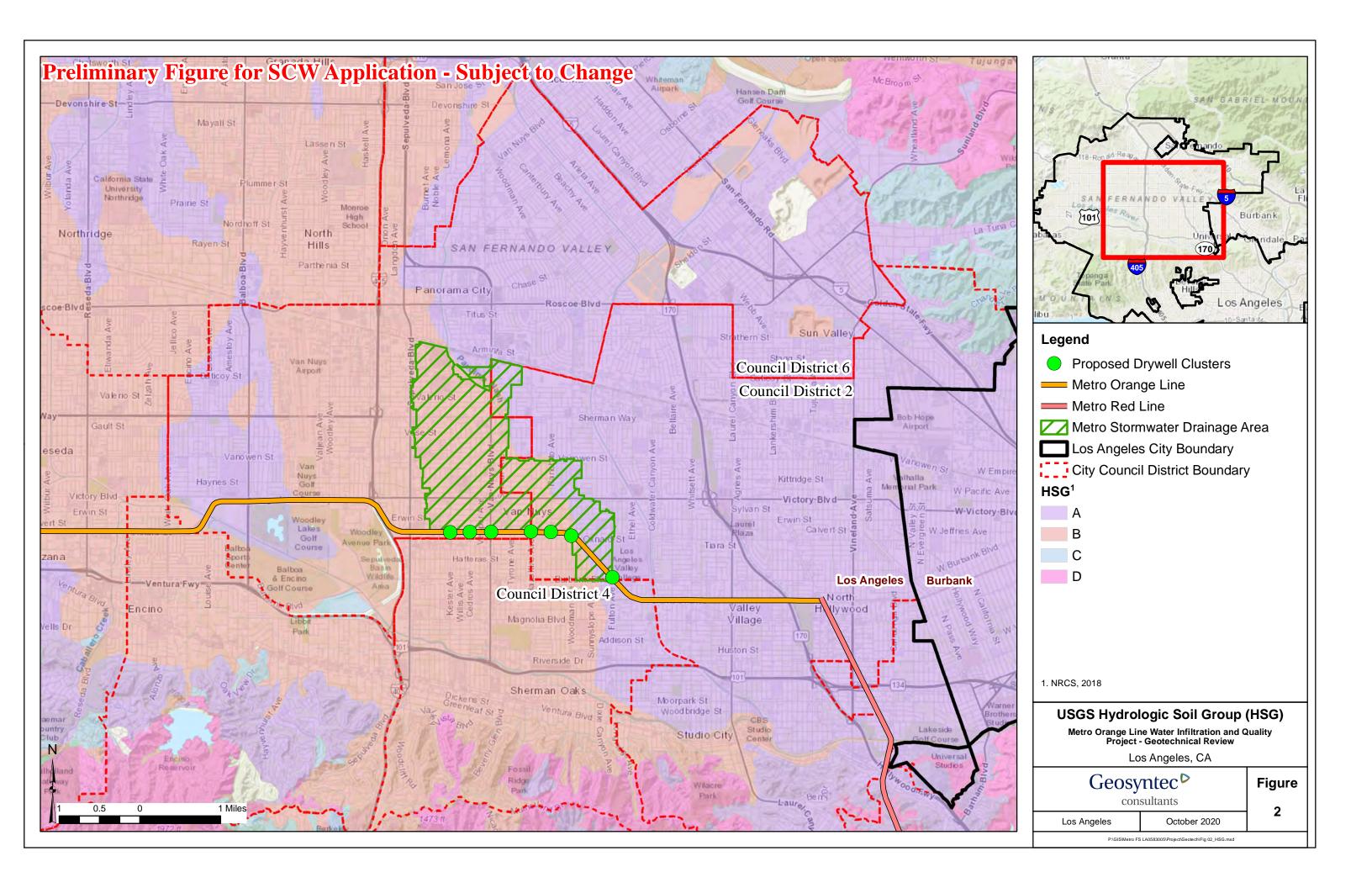
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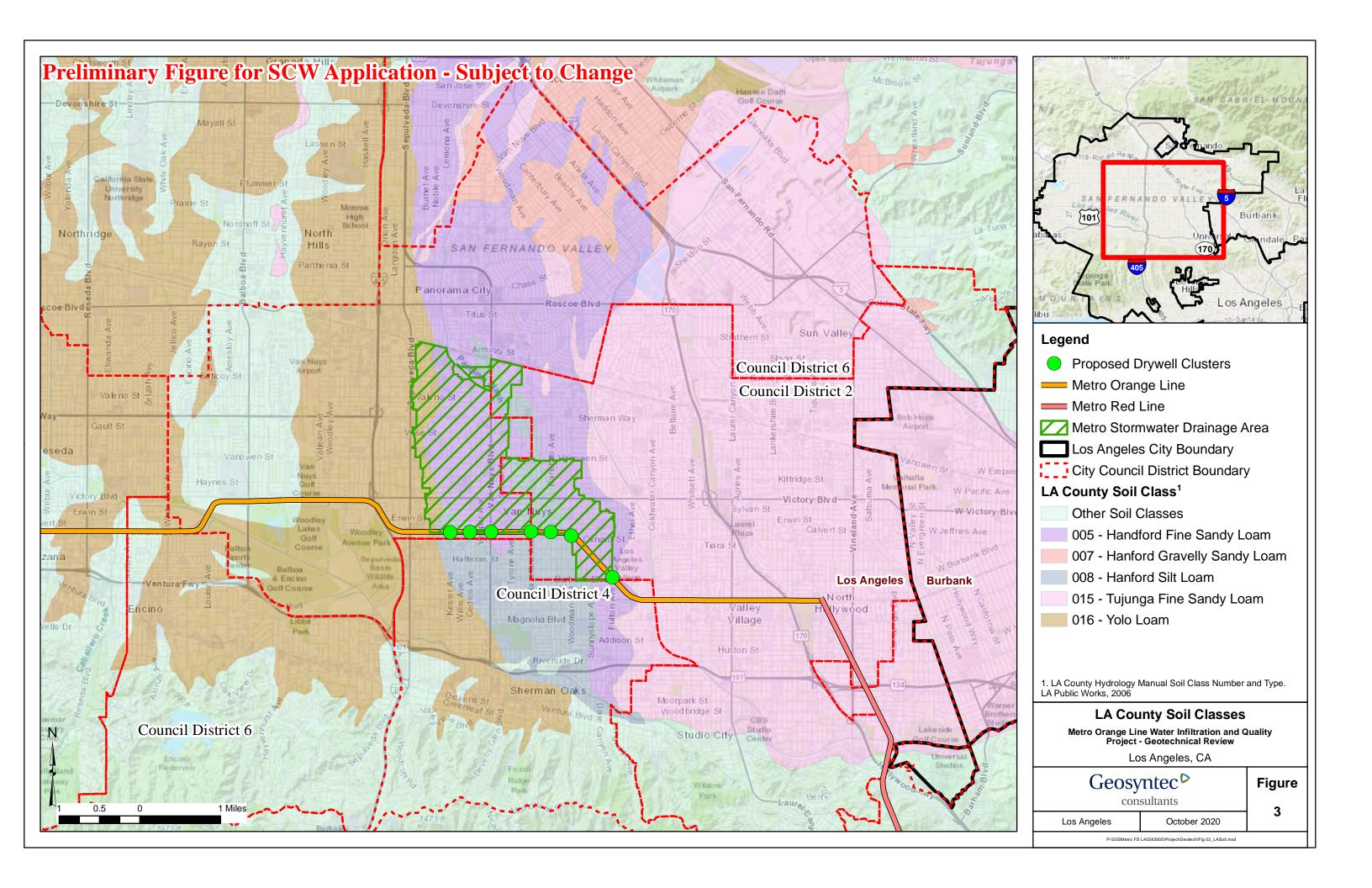
- California Geological Survey. 2020. Earthquake Zones of Required Investigation. Retrieved May 18, 2020. https://maps.conservation.ca.gov/cgs/EQZApp/app/
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- Torrent Resources. 2019. Torrent Resources Drilling Log and Percolation Test. Received April 2020.
- United States Geological Survey. 2020. U.S. Quaternary Faults- USGS Geologic Hazards Science Center Golden Co. Data Obtained May 13, 2020.

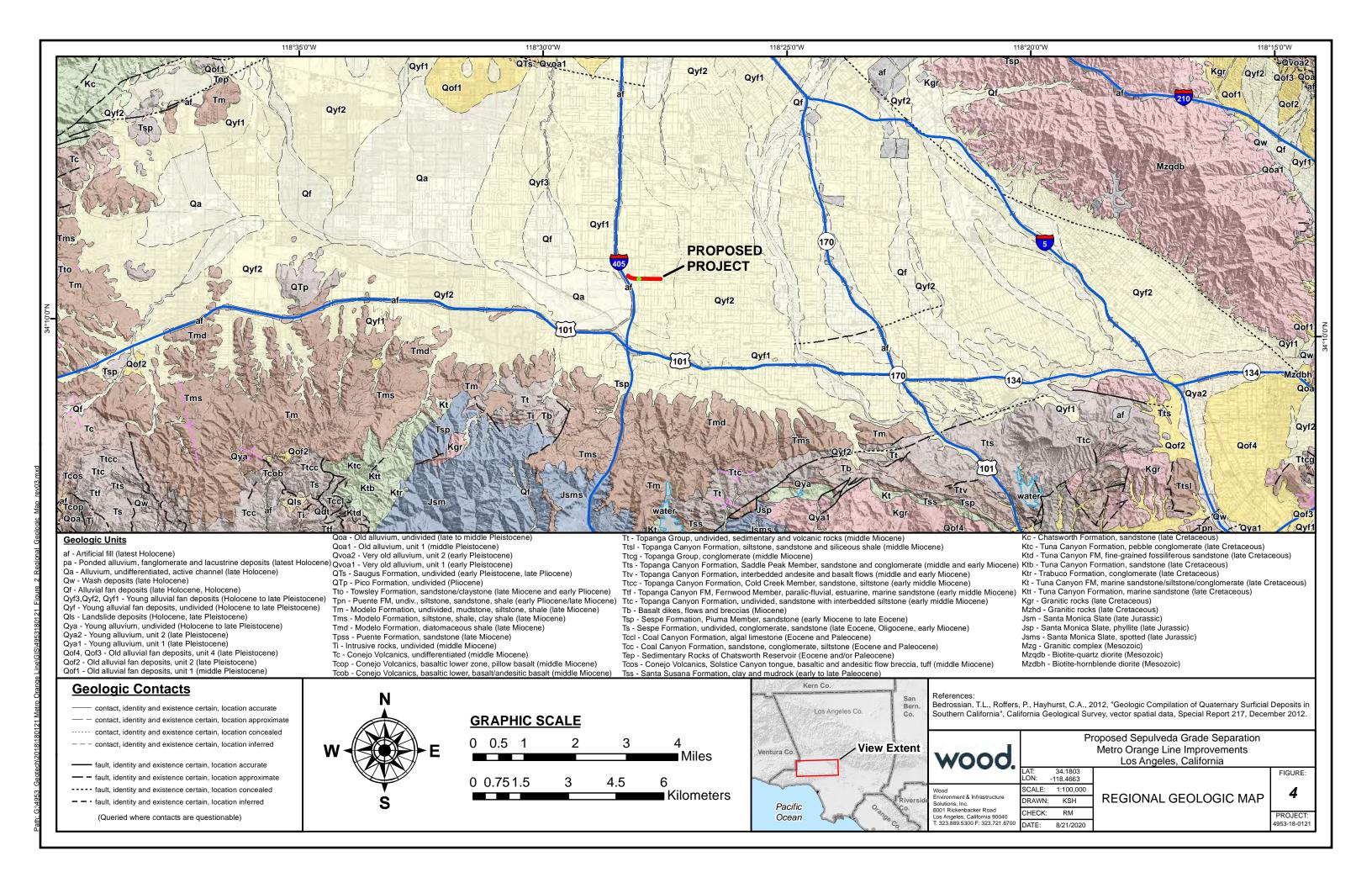
- https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf
- United States Geological Survey. 2020. Van Nuys Quadrangle Plate 1.2 Historically High Groundwater Contour and Borehole Location s, Van Nuys 7.5- Minute Quadrangle, California. Obtained May 14, 2020.
- Wood, 2020. Metro Orange Line Improvement Sepulveda Station and Grade Separation 30% Geotechnical Design Memorandum, September.

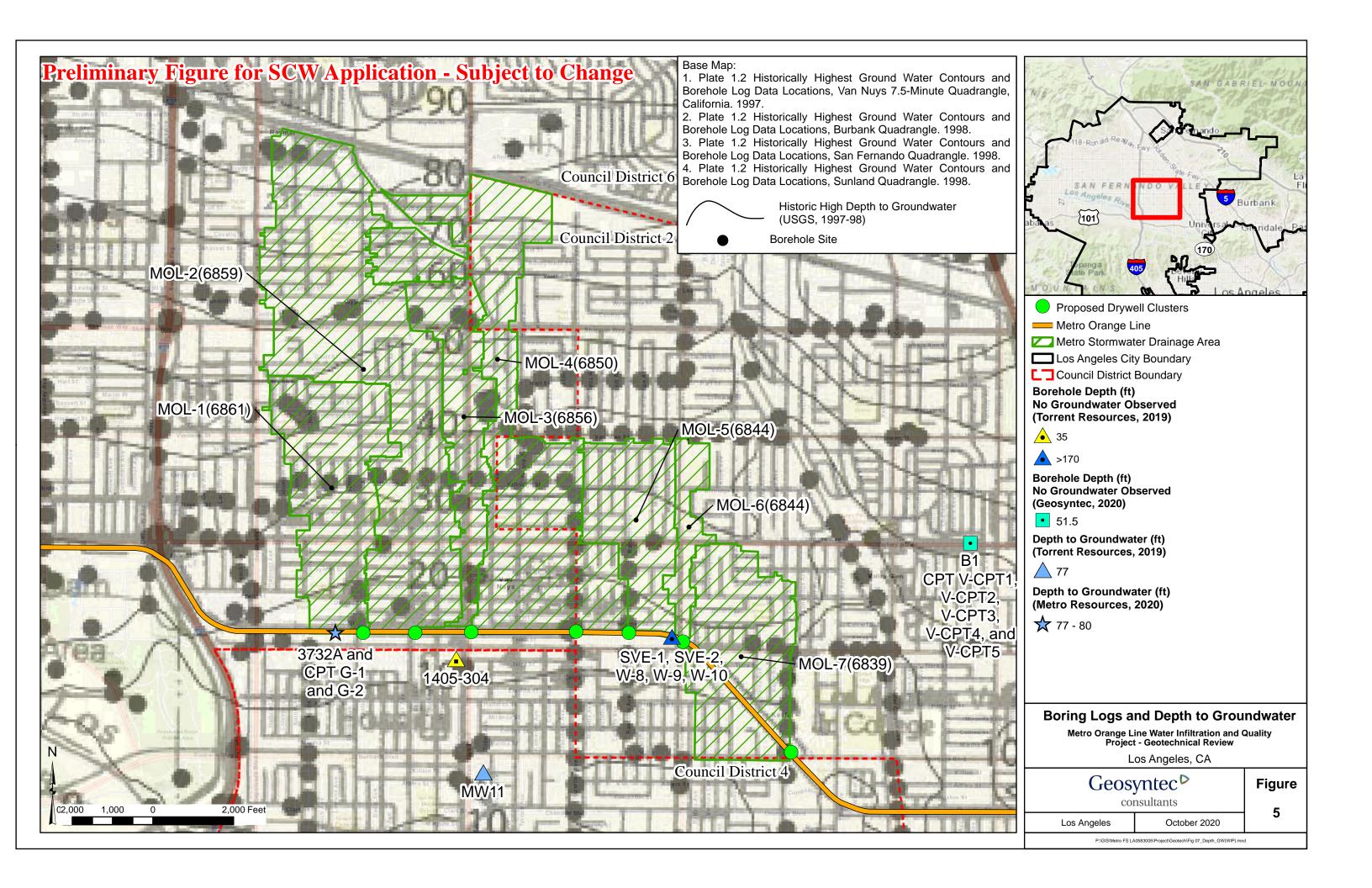
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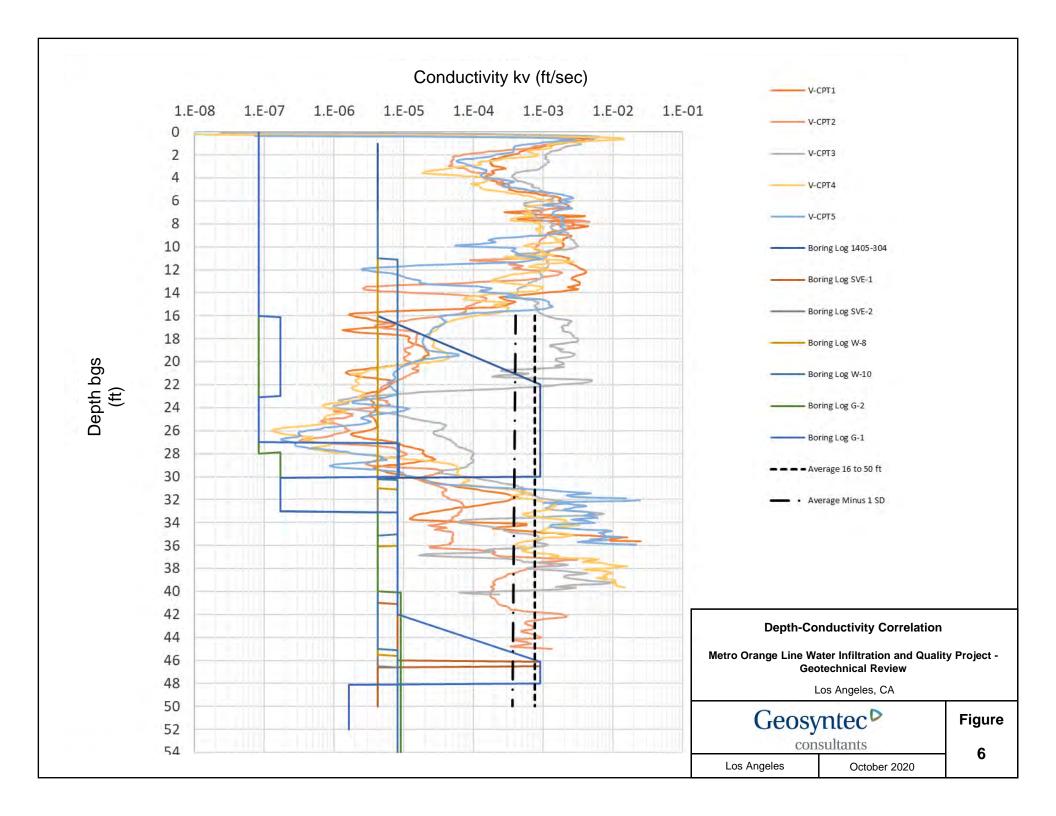


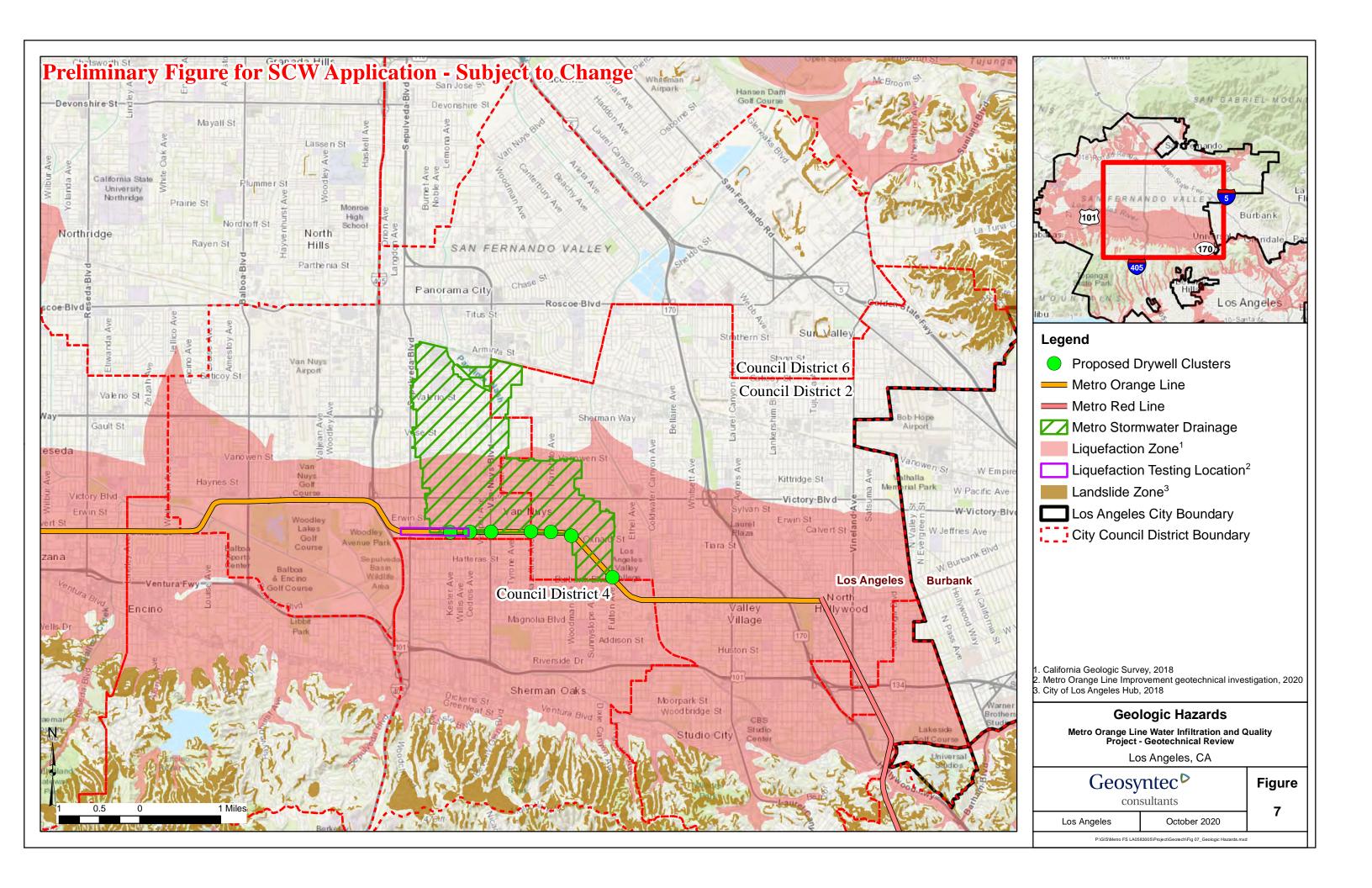


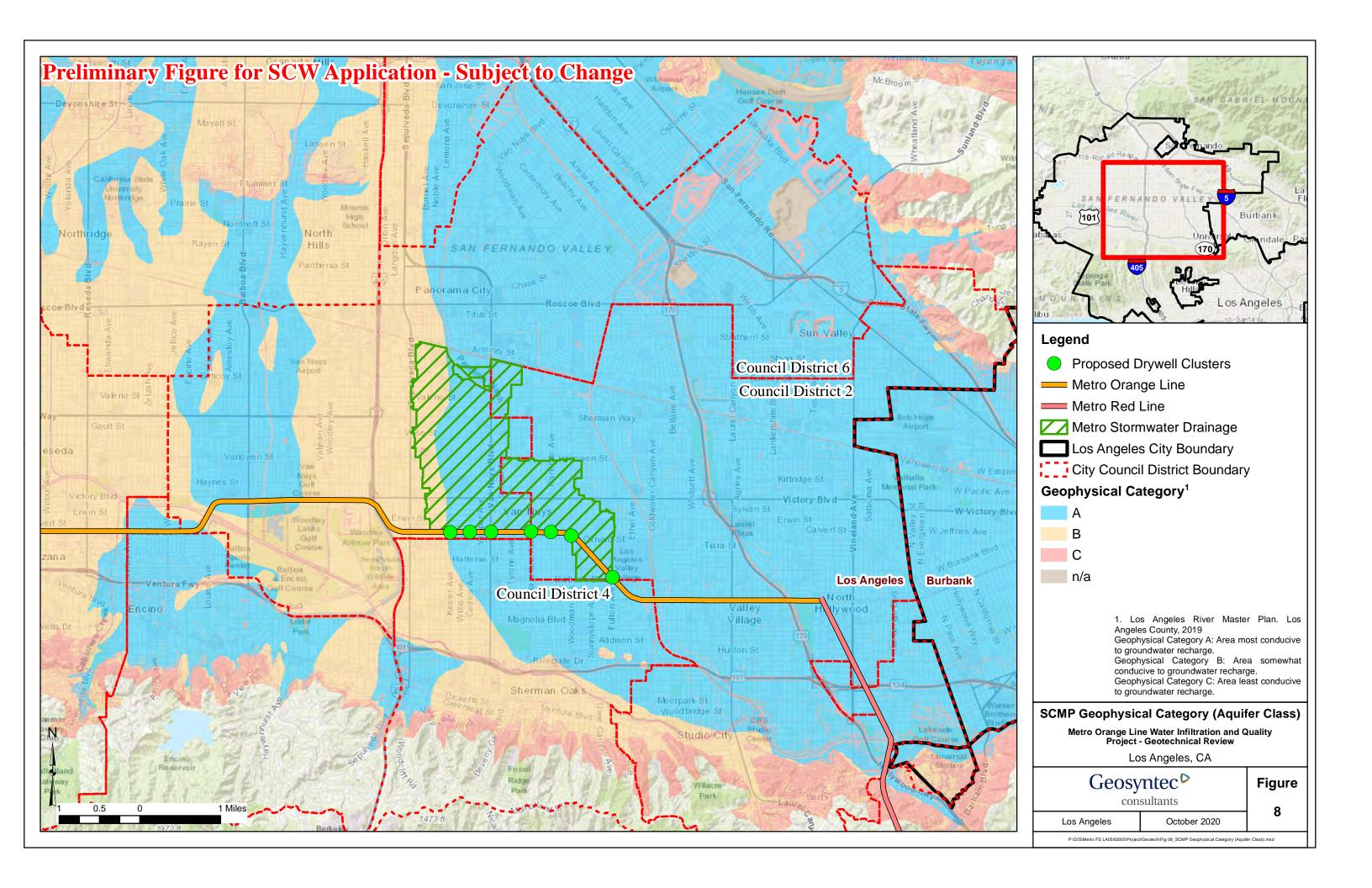






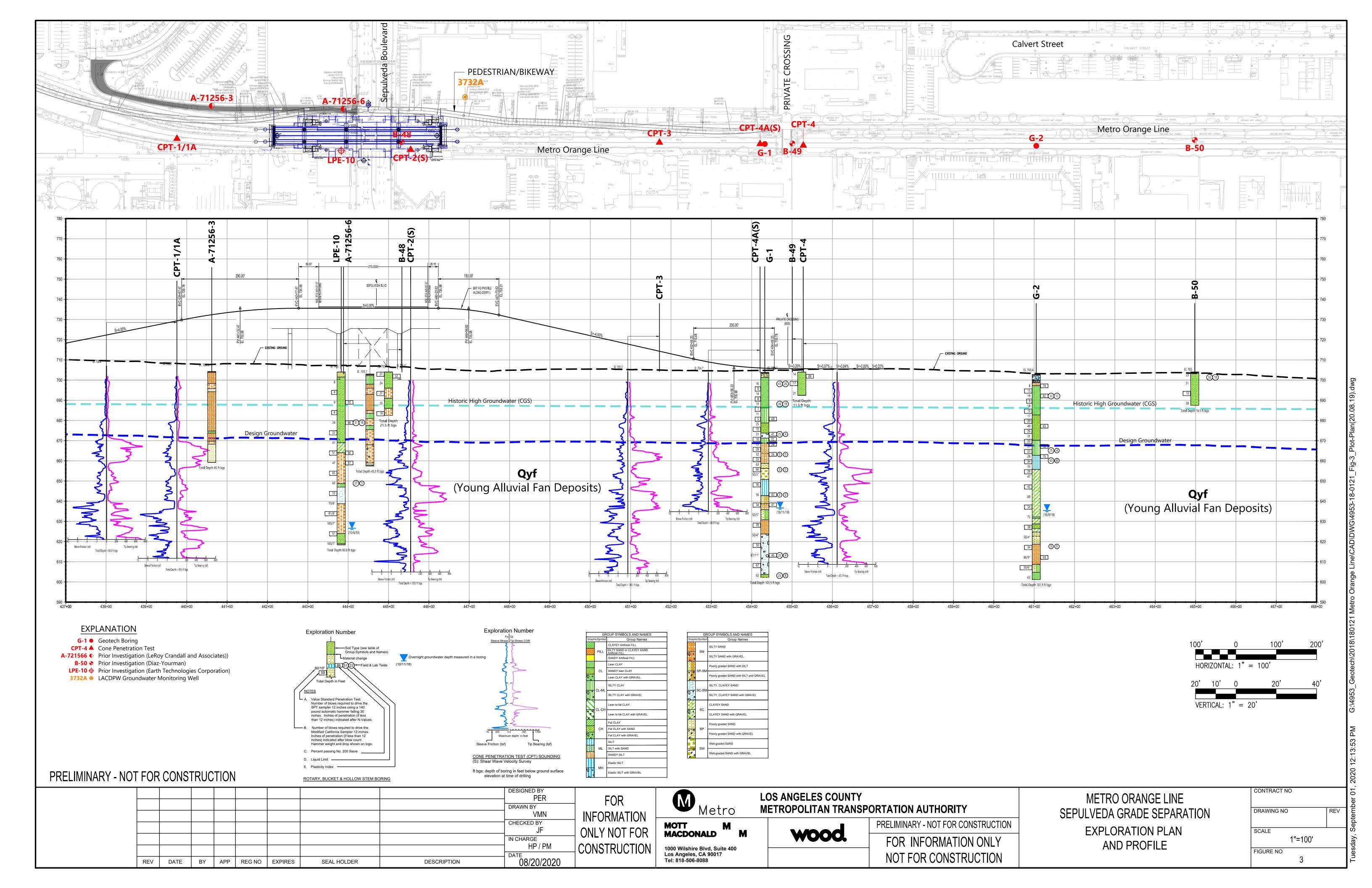


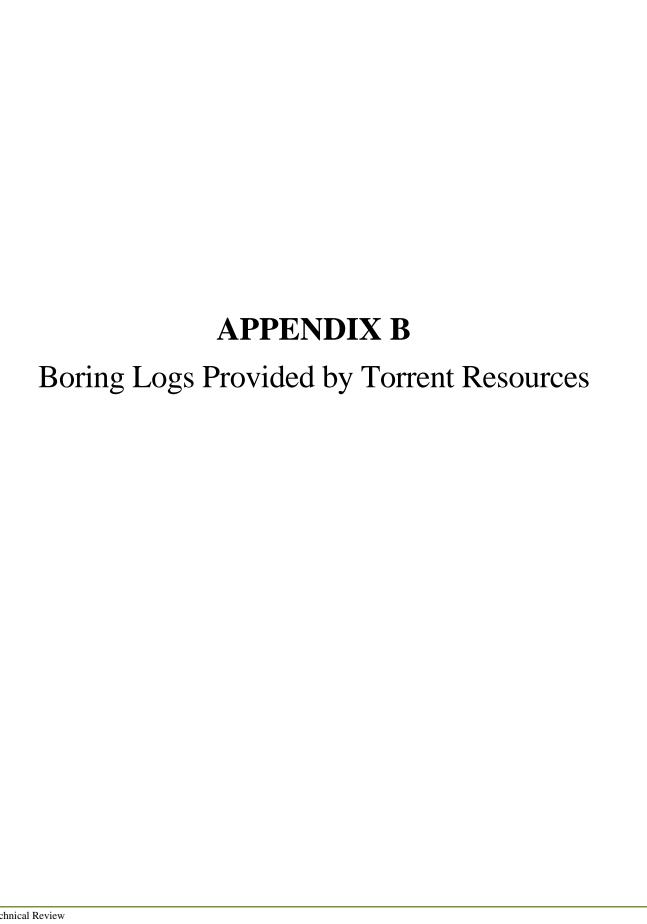




APPENDIX A

Metro Orange Line Bus Rail Transit
Improvement Project 30% Geotechnical Study –
Boring Logs and CPT Data





TORRENT RESOURCES (CA), INCORPORATED

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909/638-6644 Fax: 909/456-8851

CA Lic. 886759 A C142 www.TorrentResources.com



DRILLING LOG

LOG NO. _____

JOB NO. <u>1405-304</u>

An evolution of McGuckin Drilling

		•					
Project Name:		Project Addr	ess: Nuys & Oxn	ard Ct			
Keyes Chevrolet Contractor:	HOLE	SEC or van	2	ard St 3	4	5	6
	WELL TYPE	IV	IV	 IV	IV	IV	IV
Contractors Address:	DATE	5/14/14	5/15-16	5/12-13	5/12	5/19	5/19-20
	CREW	GH	GH	GH	GH	GH	GH
	EQUIP#	R-2	R-2	R-2	R-2	R-2	R-2
	CUT/FILL-DW	F1 ¹³	F-2 ⁶⁵	F1 ⁰³	F ⁹⁸	F.1 ⁶⁴	F.1 ⁵⁵
13-11-7-4-DL	CUT/FILL-PSC						
SOIL DESC							
Silt, Clay		1-22	1-20	1-18	1-26	1-25	1-20
Clay				18-25			
Sand, Clay		22-30	20-25	25-32	26-33	25-32	20-30
Silt, Clay		30-35	25-35	32-35	33-35	32-35	30-35
TOTAL	DEDTU	35'	35'	35'	35'	35'	35'
BACKFIL		33	33	33	33	33	33
CEMENTATION	BELLED OUT						
ozimziti/titort	HARD						
	VERY HARD			18-25			
	REFUSAL						
SOIL MOISTURE	MOIST						
	SATURATED						
PERCOLATION 1	TEST RESULTS						
LATIT							
LONGI	TUDE						
COMMENTS:		-	4				_ _
FIELD CHANGES							
ADD/DEDUCT DEPTH							
HARD ROCK @ TIME & MA	TERIALS	N					
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TITLE. 5.4TE		Ś					
TITLE: DATE:_							
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COMPLETED BY	DATE		+				 -

TORRENT RESOURCES INCORPORATED

1509 E Elwood Street

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NM Lic. 90504 GF04

www.TorrentResources.com



DRILLING LOG

LOG NO.

JOB NO. <u>1405-304</u>

An evolution of McGuckin Drilling

Project Name:		Project Addr		101			
Keyes Chevrolet Contractor:			n Nuys & Oxr		40	44	40
Contractor.	HOLE	7	8	9	10	11	12
Contractors Address:	WELL TYPE DATE	IV 5/22	IV E/24	IV E/24			+
Contractors Additess.	CREW	5/22 GH	5/21 GH	5/21 GH			
							+
	EQUIP#	R-2 F. ¹⁶	R-2 F. ⁸⁸	R-2 F. ⁴²			
40.44.7.4.01	CUT/FILL-DW	F. "	F.**	F.			
13-11-7-4-DL	CUT/FILL-PSC						
SOIL DES	CRIPTION	4.45	4.45	4.40		I	
Silt, Clay		1-15	1-15	1-10			
Clay		45.05	45.00	10-18			
Sand, Clay		15-25	15-26	18-26			
Silt, Clay		25-35	26-35	26-35			
							+
							+
#a=	DERTH	251	251	251			
TOTAL		35'	35'	35'			
BACKFILLED 10' PER A	T						
CEMENTATION	BELLED OUT						
	HARD			10 10'			
	VERY HARD REFUSAL			10-18'			
SOIL MOISTURE							
SOIL IVIOIS I UKE	MOIST						
BBBBB 4-1211	SATURATED						
PERCOLATION							
LATI							
COMMENTS:	11001			<u> </u>		<u> </u>	
FIELD CHANGES ADD/DEDUCT DEPTH HARD ROCK @ TIME & MA APPROVED BY:		w N					
TITLE: DATE:		Š					
COMPLETED BY	DATE		<u> </u>				<u> </u>



DRILLING COMPANY: Water Development Corporation

8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well SVE-1

1 of 3

PROJECT: Sawyer Petroleum SURFACE ELEVATION: Not Measured

LOCATION: 14117 AETNA ST., VAN NUYS, CA TOTAL DEPTH: 151 5 feet BORING DIAMETER: 8 inches

PROJECT NO: 06.202 DEPTH TO FIRST SATURATION: N/A

DATE BEGAN: 9/7/06 FINISHED: 9/12/06 TOP OF WELL CASING ELEVATION: N/A

STATIC GW ELEVATION: DATE: N/A DRILLING METHOD: Hollow-Stem Auger LOGGED BY: E. Kuhn CHECKED BY: D. Henry

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

<u> </u>	-				J. G. G.	y out of location, there may be consequential changes in a	Districtions			
DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DЕРТН (feet)	Well Diagram
						AIRKNIFED TO 7 FEET				well box encased in concrete
5 -			<u> </u>			·			5—	
10 —						SILT with Sand - dark brown [10YR 3/3], very stiff moist; fine- to medium-grained; trace clay	ml		10	blank 4 inch dia. SCH
15	ĭ	SVE-1d10	1019	 10/12/15	0.0	SILT - dark brown [10YR 3/3], very stiff, moist; trace clay; trace amount of fine gravel; trace fine-to medium-grained sand	ml		15	blank 4 inch dia, SCH 80 PVC from 0-130 feet
20	X	SVE-1d15	1027	11/15/20	0.0	Sandy SILT - dark brown [10YR 3/3] dense, moist; fine- to medium-grained sand; trace clay	mi		20	
	₹,	SVE-1d20	1042	15/15/20	03		SASTOREARS			neat cement from 1-45 feet
25 —	Į,	SVE-1d25	1053	15/18/22	0.0		en de contracteur de		25	
30 —	T ≅s	VE-1d30	1101	10/12/18	0.0	SILT - dark yellowish brown [10YR 3/4] very stiff	ml		30	
35 -	Ι ≤s	VE-1d35	1109	15/17/25	00	moist; trace clay; trace fine- to medium-grained sand. dark brown [7 5YR 3/4] hard			25 27 21 21 21 21 21 21 21 21 21 21 21 21 21	
40 -	[VE 1d40 1	1116	10/16/ 22	2.3	O'L OAND C		4		
45 - 1						Silty SAND - fine- to medium-grained, very dark grayish brown [10YR 3/2], dense moist; trace amount of fine gravel	sm III	4	5 1 1 1 1 1	
50 -				7/17/18 5/25/30	25.1	SAND - fine- to coarse-grained, yellow brown [10YR 5/4], dense, moist. SILT with Sand - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand; trace clay	SP E	56		bentonite chips from 45-48 feet
Borner				J. 23136	2.5.1		ml Ş		1	
Remarks	MOU	es: 1) PID	Used:							Page



8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well SVE-1

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/7/06

FINISHED: 9/12/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions.

						y other location there may be consequential changes in co					
DEPTH (feet)	Samples	Sample I D.	Time	Blow Counts (per 6 inches)	(bbm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)		Well Diagram
55 -		SVE-1d55	1310	20/25/25	22.8	Sandy SILT - dark brown [10YR 3/3]. hard moist; fine- to medium-grained sand; very dark grayish brown [10YR 3/3];			55— 		
60 -		SVE-1d60	1407	10/12/20	59 7	dark brown [10YR 3/3] trace amount of fine gravel;			60		#2/12 sand filter pack from 48-72 feet
65 — 70 —						no sample recovery at 65 feet			65		
] "	\blacksquare	- SVE-1d70	1031	13/20/25	180	CII Turith Cand dayl valleyish bear 140VD	ml				
75 —	- - - 1					SILT with Sand - dark yellowish brown [10YR 3/4], hard, moist; fine- to medium-grained sand; trace amount of fine gravel	ml		75		—bentonite chips fram 72-75 feet
- 80 —		SVE-1d75	1043	32/50	39 6	SILT - dark brown [10YR 3/3], hard, moist; trace fine- to medium-grained sand; trace amount of fine gravel	ml		80		72737373
-		SVE-1d80	1103	20/23/27	134	SILT with Sand - very dark grayish brown [10YR 3/2], hard, moist; fine- to medium-grained sand; trace amount of fine gravel	ml				100 mg/s/s/s/s/s/s/s/s/s/s/s/s/s/s/s/s/s/s/s
85 — - -		SVE-1d85	1122	19/20/21	29.4	Silty SAND - fine- to medium-grained, brown [10YR 4/3], dense moist; trace amount of fine and	sm·		85 —		
90 —						coarse gravel; olive brown [2.5Y 4/3], very dense.			90 -		
95 —		SVE-1d90	1136	25/50	46 4	SAND with Gravel - fine- to coarse-grained dark grayish brown [2 5Y 5/2], very dense moist; fine and coarse gravel	ml		95		
100 —		SVE-1d95	1331	20/22/25	63.8	Sandy SILT - brown [10YR 4/3], hard, moist; fine- to medium-grained sand; trace clay. SILT with Sand - olive brown [2 5Y 4/3] hard, moist; fine-grained sand	ml ml				
		SVE-1d100—	1356	1 9/22/26	64.8	SILT - dark olive brown [2 5Y 3/3], hard, moist; trace fine- to medium-grained sand.	ml				neat cement from 75-125 feet
105	T _s	SVE-1d105	1458	35-50	2.1	Sandy SILT - dark brown [7 5YR 3/3] hard moist; fine- to medium-grained sand	ml s	1	05 11 11 11 11 11 11 11		
110 -	I I	:VE-1d110	1523	22/23/27	17	brown [10YR 4/3] trace amount fine gravel			10 		
			j						\downarrow		
Remar	ks/No	otes: 1) Pl	D Used:								Page of 3
										2	UIS



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Log of Boring/Well SVE-1

PROJECT: Sawyer Petroleum

PROJECT NO.: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/7/06

FINISHED: 9/12/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

<u> </u>				t	ime or at any	y other location, there may be consequential changes in co	nditions			
DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
120 125 130 140 155 160 170 175		SVE-1d115	1533	面 Š	15	Silty SAND - fine- to medium-grained brown [10YR 4/3], dense, moist SAND - fine- to coarse-grained light ofive brown [2 5Y 5/3] dense, moist Silty SAND - fine- to medium-grained ofive brown [2 5Y 4/4] very dense, moist SILT with Sand - dark brown [7 5YR 3/4] hard moist; fine- to medium-grained sand Silty SAND - fine- to medium-grained dark brown [7 5YR 3/4], dense moist SAND with Silt - fine- to medium-grained, yellowish brown [10YR 5/4] very dense moist Silty SAND - fine- to medium-grained dark yellowish brown [10YR 4/4] very dense moist; trace amount of fine gravel SILT with Sand - dark yellowish brown [10YR 3/4], hard, moist; fine-grained sand. Bottom at 151 5 feet	sm sp sm		120 125 130 135 140 145 151	bentonite chips from 125-128 feet #2/12 sand filter pack from 128-151 5 feet screened (0.02 inch slots) 4 inch dia SCH 80 PVC from 130-150 5 feet
Remark	s/Not	es: 1) PID	Used:							Page 3 of 3



8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well SVE-2

PROJECT: Sawyer Petroleum SURFACE ELEVATION: Not Measured

LOCATION: 14117 AETNA ST., VAN NUYS, CA

TOTAL DEPTH: 152 feet BORING DIAMETER: 8 inches

PROJECT NO: 06.202 DEPTH TO FIRST SATURATION: N/A

DATE BEGAN: 9/5/06

FINISHED: 9/7/06

TOP OF WELL CASING ELEVATION: N/A

DRILLING COMPANY: Water Development Corporation STATIC GW ELEVATION:

DATE: N/A

1 of 3

DRILLING METHOD: Hollow-Stem Auger

LOGGED BY: E. Kuhn. CHECKED BY: D. Henry and the time and place of drilling. With the passage of

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

DEPTH (feet)	Samples	Sample I.D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
5						AIRKNIFED TO 7 FEET			5	well box encased in concrete
10			1040		0.1	SILT with Sand and Clay - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel SILT with Sand - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to medium-grained sand; trace clay	mi		10	
20 1 1 25 1 1 1		SVE-2d20 SVE-2d25	1114	6/10/12 12/15/15	-0.0	Sandy SILT with Clay - dark brown [10YR 3/3] very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel Sandy SILT - dark brown [10YR 3/3] very stiff, moist; fine- to medium-grained sand; trace clay	mi mi		20	—neat cement from 1-45 feet
30		SVE-2d30	1126 1134	16/20/23 10/16/20	0.5	SILT with Sand - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand; trace clay SILT with Sand - very dark grayish brown [10YR 3/2] hard moist; fine- to medium-grained sand	ml :		35 1 1 1 1 1 1 1 1 1	blank 4 inch dia, SCH 80 PVC from 0-130 feet
45 45		SVE-2d40 :VE-2d45 4	1255	17/20/22 22/23/25	45 0 -76.7	Silty SAND - fine- to medium-grained olive brown [2 5Y 4/4] dense moist.	sm		40 1 1 1 1 1 1 1 1 1	bentonite chips from 45-48 feet
Remarks) Used:	18/25/21	72		ml		50 —	#2/12 sand filter pack from 48-71 feet



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Log of Boring/Well SVE-2

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/5/06

FINISHED: 9/7/06

2 of 3

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

		ti	me or at any	other location, there may be consequential changes in co	nditions.			
DEPTH (feet) Samples O I o	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soif Class	Graphic Log	DEPTH (feet)	Well Diagram
55	1321	12/14/16	116	SILT with Clay - dark brown [10YR 3/3], hard moist; trace fine- to medium-grained sand Silty SAND - fine- to medium-grained, dark olive brown [2 5Y 3/3] dense moist;	sm		55 -	
60 SVE-2d60	1331	16/19/22	325				60-	
65 - T	1338	20/23/23	85 2	trace amount of fine gravel			65	
70	1412	12/14/18	35.4	Sandy SILT - dark olive brown [2 5Y 3/3] hard moist; fine- to medium-grained sand	m!		75	bentonite chips from 71-73 feet
SVE-2d75	1425	12/20/20	9.1	Silty SAND - fine- to medium-grained, dark olive brown [2.5Y 3/3], dense, moist; trace clay. SAND with Gravel - fine- to coarse-grained, dark grayish brown [2.5Y 4/2] dense moist; fine to coarse gravel.	sp sp		80 —	
85 - T - SVE-2d85		12/14/19 35/51	3.4	SAND with Silt and Gravel - fine- to coarse-grained, dark grayish brown [10YR 4/2] dense, moist; fine to coarse gravel. Silty SAND - fine- to medium-grained, dark brown [10YR 3/3] dense, moist; trace amount of fine gravel; very dark grayish brown [10YR 3/3], very dense;	E sm		85	
90	1506	35/50	0.0	olive brown [2 5Y 4/3].			90 1 1 1 1 1 1 1 1 1	
95 SVE 2d95		19/23/22	112	SILT - dark olive brown [2.5Y 3/3], hard, moist; trace clay; trace amount of fine gravel; trace fine-to medium-grained sand	ml		100	neat cement from 73-125 feet
SVE-2d100	Was	16/20/20	73				105	
SVE-2d105		12/15/19 13/25/27	2.6	Silty SAND - fine- to medium-grained, dark brown [7 5YR 3/4], dense moist; trace amount of fine gravel; very dense. SILT with Sand - dark brown [7 5YR 3/3] hard moist; fine- to medium-grained sand	sm ml		110 111 1	
Remarks/Notes: 1) P	ID Used:	į						Page



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Log of Boring/Well SVE-2

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/5/06

FINISHED: 9/7/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

DEРТН (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
120 -		SVE-2d115	0927	18/20/22	22,4	Sandy SILT - dark grayish brown [10YR 4/2] hard moist; trace amount of fine gravel	ml		120	
125 —		SVE 2d120	0942	23/50	144	SAND - fine- to medium-grained yellowish brown [10YR 5/4] dense, moist; very dense.	sp		125	bentonite chips from 125-128 feet
130 —	T	SVE-2d125	0951	25/23/28	79.2	Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense, moist	sm		130	bentonite chips from 125-128 feet
135 —		SVE-2d130	1000	19/23/28	59.4	Sandy SILT - dark olive brown [2 5Y 3/3], hard moist; fine- to medium-grained sand; trace clay	ml		135	#2/12 sand filter pack from 128-152 feet
140 —		SVE-2d135	1013	21/24/25	29.3	Silty SAND - fine- to medium-grained, very dark grayish brown [10YR 3/2] dense, moist	sm		140	1011 120-132 feet
 145 —		SVE-2d140	1034	20/27/30	25.9	SAND - fine- to coarse-grained, yellowish brown [10YR 5/4], very dense, moist; trace amount of fine gravel	sp		145 —	screened (0.02 inch
50 —		SVE-2d145	1056	23/50	62	Silty SAND with Gravel - fine- to coarse-grained very dark grayish brown [10YR 3/2], very dense, moist; fine gravel	sm		150	slots) 4 inch dia SCH 80 PVC from 130-150.5 feet
55 —		SVE-2d150	1103	23/29/33	5.4	SILT with Sand - very dark grayish brown [10YR 3/2], hard, moist; fine- to medium-grained sand; trace amount of fine gravel. Bottom at 152 feet	ml		155	[20034203]
60								1	160 1	
55								1	65 - 1111	
70 ~ 1 1 1 1 1 1		; ;						1	70-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	
75 —								1	75	
Remarl	ks/N	lotes: 1) PII	D Used:	.						Page 3 of 3



8281 Commonwealth Avenue (714) 826-0352

Log of Boring/Well W-8

Buena Park, California 90621 www.wpinc.com SURFACE ELEVATION: Not Measured PROJECT: Sawyer Petroleum TOTAL DEPTH: 193 feet BORING DIAMETER: 10 inches LOCATION: 14117 AETNA ST., VAN NUYS, CA DEPTH TO FIRST SATURATION: 173 feet PROJECT NO: 06 202 TOP OF WELL CASING ELEVATION: N/A DATE BEGAN: 9/12/06 FINISHED: 9/18/06 DATE: N/A DRILLING COMPANY: Water Development Corporation STATIC GW ELEVATION: DRILLING METHOD: Hollow-Stem Auger LOGGED BY: E. Kuhn CHECKED BY: D. Henry This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions w Counts • 6 inches) Well Diagram Sample I D (M/wdd) Graphic Log DEPTH (feet))EPTH (feet) Geologic Description E. Blow (per 6 AIRKNIFED TO 7 FEET well box encased in Sandy SILT with Gravel - dark brown [7.5YR 3/3], hard moist; fine- to medium-grained sand; fine gravel 10 10/13/20 SILT with Sand - brown [7 5YR 4/4], hard, moist; fine-grained sand; trace amount of fine gravel 15 9/15/20 Sandy SILT - dark brown [7 5YR 3/3], hard, ml moist; fine- to medium-grained; trace clay 20 SILT with Sand - dark brown [7 5YR 3/3], hard moist; fine- to medium-grained sand; trace clay 25 blank 4 inch dia. SCH 80 PVC from 0-160 25

13/17/18 Silty SAND - fine- to medium-grained, dark mi brown [7 5YR 3/4], dense, moist; trace amount of fine gravel 30 30 Clayey Silty SAND - fine- to medium-grained sm dark brown [7 5YR 3/4] dense moist; trace amount of fine gravel. 35 35 15/15/20 SILT - dark brown [7.5YR 3/4] hard, moist; trace ml amount of fine-grained sand. 40 Clayey Sandy SILT - dark yellowish brown [10YR mi 3/41, hard, moist; fine- to medium-grained sand 45 mi 15/19/22 SILT - very dark brown [10YR 2/2], hard, moist. Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 4/4] dense, moist;

dark brown [10YR 3/3] very dense.

12.6

20/23/27

Remarks/Notes: 1) PID Used:

W-8d50

1110

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Log of Boring/Well W-8

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/12/06

FINISHED: 9/18/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

				t	ime or at any	other location, there may be consequential changes in co	nditions.			
DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil	Graphic Log	DEPTH (feet)	Well Diagram
55									55	
35 -	×	W-8d55	1117	15/18/31	15	Clayey Sandy SILT - very dark grayish brown [10YR 3/2] hard moist; fine- to medium-grained sand.	ml ml		3	
60	Ţ	W-8d60	1129	10/18/24	12.9	Sandy SILT - dark brown [10YR 3/3] hard moist; fine- to medium-grained sand; trace amount of fine gravel.	sm		60 -	
65 —						Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense moist; trace amount of fine gravel	5111		65	
11111	×	W-8d65	1227	20/25/37	63 1				-	
70 -	Ţ	W-8d70	2	14/30/37	1.8	Clayey Silty SAND - fine- to medium-grained,	sm	Z =	70 —	
75 —						strong brown [7 5YR 3/4], very dense moist; trace amount of fine and coarse gravel			75	neat cement from
	×	W-8d75	1307	33/50	206	Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense moist.	sm			
80	I	W-`8686-W	1339	19/20/25	15.8				80	
85 -									85	
1111	×,	N-8d85	1418	35/50	197	Clayey SILT - dark gray [10YR 4/1] hard moist	ml ·		11111	
90 -	Ţ	N-8d90	1423	20/27/42	24.9			彦	90-	
95 —			1.20			SILT - dark grayish brown [2 5Y 4/2], hard moist	ml		95	
	Ţ	V-8d95	1436	22/31/38	85.9	Silty SAND - fine- to medium-grained olive brown [2.5Y 4/3] very dense moist	sm		,	
100 =									₩.	
	V	V-8d100	1443	25/50	34	Sandy SILT with Clay - dark olive brown [2 5Y 3/3] hard, moist; fine- to medium-grained sand	mi		105	
105	Ţ	V 8d105	1458	10/25/33	12.9	Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/6], very dense, moist;	sm		3	
110	Į,	√-8d110	1506	29/25/35	3.9	trace amount of fine gravel.		1	10-1	
						Clayey Sandy SILT - olive brown [2.5Y 4/4]. hard moist; fine- to medium-grained sand	ml ·			
Da1		too: 4) D?	D. Hood:					ļ		_
Remark	SVIVC	nes. 1) Pli	D Used:						Ī	Page

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8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well W-8

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/12/06

FINISHED: 9/18/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions.

		- L1	ine or acany	builer location, there may be consequential changes in c					
DEPTH (feet) Samples O - o	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil	Graphic Log	DEPTH (feet)	W	'ell Diagram
120 — W-8d115 — 125 — 130 — W-8d130 — W-8d130	1510	28/32/35	37.3	SILT with Clay and Sand - brown [10YR 4/3]. hard moist; fine- to medium-grained sand; no sample recovery at 120 feet; no sample recovery at 125 feet. Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense moist;	ml		125		
135 - W-8d135	1124	19/17/24 15/20/20	0.1	dark brown [10YR 3/3] dense trace amount of fine gravel; no sample recovery at 140 feet Clayey SILT - dark olive brown [2 5Y 3/3], hard moist; trace fine- to medium-grained; trace amount of fine gravel.	ml		140		
150 - W 8d150 - 155 - W 8d155 - 155		30/32/35 18/48/21	0.0	Sandy SILT with Clay - dark olive brown [2.5Y 3/3], very dense, moist; fine- to medium-grained. Clayey SILT with Sand - dark brown [10YR 3/3], hard moist; fine- to medium-grained	ml ml		155 —		—bentonite chips from 153-157 feet
160 W 8d160 W 8d165 W 8d165 W 8d170 W 8d170	1435	19/25/20 18/29/25 20/29/29	0.0	Sandy Clayey SiLT with Gravel - dark grayish brown [10YR 4/2], hard, moist; fine- to coarse-grained sand; fine gravel Clayey Sandy SiLT - dark olive brown [2 5Y 3/3], hard, moist; fine- to medium-grained sand Clayey SiLT - dark olive brown [2.5Y 3/3], hard very moist; trace amount of fine-grained sand;	mi mi		02 05		—#2/12 sand filter pack from 157-193 feet
175	PID Used:			very moist; trace amount of tine-grained sand;			75		Page of 4



8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www wpinc.com

Log of Boring/Well W-8

PROJECT: Sawyer Petroleum

PROJECT NO: 06 202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/12/06

FINISHED: 9/18/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

l		_		me or at any	other location, there may be consequential changes in co	nations	-		<u> </u>
DEPTH (feet) Samples	Sample ID	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
180	W-8d175	1506	20/20/25	0.0	saturated; trace amount of fine- to medium-grained sand			180—	screened (0 02 inch
185	₹ W 8d180	1543	19/20/29	0.0	Sandy SILT - olive brown [2 5Y 4/4] hard moist; fine- to medium-grained sand	ml		185	screened (0 02 inch slots) 4 inch día SCH 80 PVC from 160-190 5 feet
	≤ W-8d185	1611 1	-18/19/30 -	0.0	Clayey SILT with Sand - olive brown [2 5Y 4/3]. hard moist; fine- to medium-grained sand	ml		-	
190	W-8d190	1620	-19/25/25 	0.0	Silty SAND with Clay - fine- to medium-grained dark brown [7.5YR 3/4], dense, moist.	sm		190 —	
195					Bottom at 193 feet			195	
200 -								200 —	
205 —								205—	
210 —								210	
215								215—	
220 —								220	
225 —								225	
230								230	
								بايليانا	
235 —								235	
Remarks/l	Notes: 1) PII	O Used:							Page

Page 4 of 4



WAYNE PERRY, INC. 8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352

Log of Boring/Well W-9

		w wpinc c							
PROJECT: Sawyer	r Petroleum	7			SURFACE ELEVATION:	: Not N	<i>l</i> easur	red	
LOCATION: 14117	' AETNA ST	T., VAN N	UYS, CA		TOTAL DEPTH: 193 fee	et	ВС)RING I	DIAMETER: 10 inches
PROJECT NO: 06	3.202				DEPTH TO FIRST SATU	JRATIC)N: 1	170 feet	t
DATE BEGAN: 9/1	8/06	FIN	VISHED:	9/29/06	TOP OF WELL CASING	ELEV/	ATION	: N/A	
DRILLING COMPAN	1Y: Water	Developn	nent Corpo	oration	STATIC GW ELEVATION	N:			DATE: N/A
DRILLING METHOD): Hollow-	Stem Aug	er		LOGGED BY: E. Kuhn				. Henry
	Thi	is log is a re ti	presentation me or at any	n of subsurface conditions y other location, there may	at the time and place of drilling. be consequential changes in cor	With the nditions	e passag	ge of	
Sample (seet)	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Descri	iption	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
5		-		AIRKNIFED TO 7 FEE				5 - 1 - 1 - 1 - 1 - 1 - 1	well box encased in concrete
10 - W-9d10	0957	10/13/17	00	Clayey SILT - very dar very stiff moist; trace f sand; trace fine gravel	rk grayish brown [2 5Y 3/2], fine- to medium-grained	mi		10 11 11 11 11 11 11 11 11 11 11 11 11 1	
20 - W 9d20	1005	15/16/19 19/20/21	0.0	Sandy SILT - dark brown moist; fine- to medium-	-grained sand	ml		20-	
25 - W-9d25		15/16/24	0.0	Clayey Sandy SILT - d hard moist; fine- to me	edium-grained sand			25—	
30				Clayey SILT - dark bro moist; trace fine- to me	edium-grained sand	mi sm		30-	
35 — W-9d35		17/17/20 15/16/20	00	brown [7.5YR 3/4], den- SILT with Clay - dark b moist; trace fine- to me	nse, moist. / brown [10YR 3/3], hard,	mi		35	
40		-		→ Clayey SILT - dark brow	wn 17 5YR 3/31 hard.	-ml		40	blank 4 Inch dia. SCH 80 PVC from 0-160
W-9d40 			0.0	moist; trace fine- to med amount of fine gravel.	dium-grained sand; trace / k brown [10YR 2/2] hard.	m		45	feet
₩-9d45	1105 - 1	19/20/20	3.1	Silty SAND - fine- to me brown [10YR 2/2], dens	nedium-grained, very dark se moist	sm		. =	

Remarks/Notes: 1) PID Used:

Page 1 of 4



WAYNE PERRY, INC. 8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well W-9

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/18/06

FINISHED: 9/29/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions

DEPTH (feet) Samples On D	Time Blow Counts (per 6 inches)	PiD/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
55 W 9d55	1121 21/21/25	12.8	Clayey SILT with Sand - black [10YR 2/1] hard moist; fine- to medium-grained sand Silty SAND - fine- to coarse-grained, dark yellowish brown [10YR 3/6], dense moist	sm		55 —	20000000000000000000000000000000000000
60 - W 9d60	1128 15/15/19	4.7	Sandy SILT - dark olive brown [2 5Y 5/3] hard moist; fine- to medium-grained sand.	ml		60	
65	1136 20/21/25	16.1	Silty SAND - fine- to medium-grained dark brown [10YR 3/3] dense, moist; trace amount of fine gravel	sm		65 —	
70 W-9d70	1245 15/25/50	53.6	Sandy SILT with Clay - dark brown [10YR 3/3] hard, moist; fine- to medium-grained. Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense, moist; trace amount of fine gravel.	sm		75	
W-9d75	1256 52	01	Silty SAND with Gravel - fine- to coarse-grained, dark olive brown [2 5Y 3/3] very dense moist; fine and coarse gravel	sm		80 —	neat cement from
85	1305 12/30/30	94.7	Silty SAND - fine- to medium-grained, dark olive brown [2 5Y 3/3], very dense moist; trace amount of fine gravel; trace clay.	sm		85	
90 - W 9d86	13/15/18 13/15/19	95,3 26,0	SAND - fine- to coarse-grained, clive gray [5Y 4/2] dense moist; trace fine and coarse gravel Silty SAND - fine- to medium-grained, light olive	sp sm <		90 -	
95 - W-9d95	13/16/19 15/16/19	26,0	brown [2.5y 5/4], dense moist; trace amount of fine gravel. Clayey SILT - olive brown [2.5Y 4/4], hard moist; trace fine- to medium-grained sand.	ml		95	
100	1403 45/13/15	1.9	Silty SAND - fine- to medium-grained, dark olive brown [2.5Y 3/3], dense, moist; trace amount of coarse gravel	sm		100	
105	45/16/23	0.5	Sandy SILT - dark olive brown [2 5Y 3/3], very stiff, moist; fine- to medium-grained sand. Clayey SILT with Sand - dark brown [7 5YR 3/2]	ml		105	
110 - W-9d110	1425 <u>19/23/23</u>	38,6	\hard, moist; fine- to medium-grained. Sandy SILT - dark brown [10YR 3/3] hard, moist; fine- to medium-grained sand.	mi ml		10 1 1 1 1	
[1][1]			Clayey Silty SAND - fine- to medium-grained dark olive brown [2 5Y 3/3], dense moist		\$		
Remarks/Notes: 1) Pl	D Used:	· · · · · · · · · · · · · · · · · · ·					Page 2 of 4



WAYNE PERRY, INC. 8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well W-9

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/18/06

FINISHED: 9/29/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of

DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	\ \ 	Well Diagram
120 —		W-9d115 W-9d120	1508	14/16/20 38/50	25	SILT with Clay and Sand - dark brown [10YR \\ 3/3], hard, moist; fine- to medium-grained sand. SAND with Silt - fine- to medium-grained, gray \\ [5Y 3/1], dense, moist. Silty SAND - fine- to medium-grained dark gray \\ [2 5Y 4/1] dense, moist \\ dark olive brown [2 5Y 3/3] very dense	mi sp sm		120		
- - - 130 —		W-9d125	1518	23/25/30	51	Sandy SILT - dark olive brown [2 5Y 3/3] hard moist. Silty CLAY - dark brown [10YR 3/3] hard moist; trace fine- to medium-grained sand.	ml cl		130 —		र र र र र र र र र र र र र र र र र र र
- - - 135 —		W-9d130	1540	20/23/25	1.5	SILT with Clay - very dark grayish brown [10YR 3/2], hard moist; trace fine- to medium-grained sand. Sandy SILT - very dark grayish brown [2 5Y 3/2] hard, moist; fine- to medium-grained sand.	mi ml		135		8.18.18.18.18.18.18.18.18.18.18.18.18.18
140 —		W-9d135	0841	35/50	40.2	Sandy SILT with Clay - dark brown [10YR 3/3] hard, moist; fine- to medium-grained sand. Silty SAND - fine- to medium-grained dark brown [10YR 3/3], very dense, moist; no recovery sample at 140 feet	ml sm		140 1		
150		W-9d145	0927	51	739	Sandy SILT - dark olive brown [2 5Y 3/3], hard, moist; fine- to medium-grained sand	ml		50		
155				20/20/25	0.0	SILT - very dark grayish brown [2 5Y 3/2], hard, moist; trace fine- to medium-grained sand; trace clay	mi		55		— bentonite chips from 152.5-157 feet
160				15/19/23	0.5	Clayey SILT - dark olive brown [2 5Y 3/3] hard moist; trace fine- to medium-grained sand.	ml		60		
165				10/12/13	0.7	SILT - very dark grayish brown [2 5Y 3/2], very stiff, moist; trace fine- to medium-grained sand; trace amount of fine gravel	ml		65		
₩ ₩	Į,	*	3	29/29/20	0.0	Clayey Sandy SILT - very dark grayish brown [2.5Y 3/2] hard moist; fine- to medium-grained.	mi	17	70 1		#2/12 sand filter pack from 157-193 feet
175 —	I	7 JOHA 1	100		<u> </u>	Clayey SILT with Sand - dark olive brown [2.5Y 3/3], hard, saturated; fine- to medium-grained sand	El STATE		75-11-1		
Remark	ks/No	tes: 1) PIC) Used:			I		<u> </u>		آ ع	Page of 4



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Log of Boring/Well W-9

PROJECT: Sawyer Petroleum

PROJECT NO : 06 202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/18/06

FINISHED: 9/29/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

ļ				t	ime or at an	other location, there may be consequential changes in	conditions			
DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	(ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
180 —		W-9d175	1124	20/23/25	0.1	Clayey SILT - dark olive brown [2 5Y 3/3], hard saturated; trace fine- to medium-grained sand	ml		180	
185	I	W-96185		17/19/23	10.0	Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/6], dense moist	sm		185	screened (0.02 inch slot) 4 inch dia SCH 90 PVC from 160-190 5 feet
190 —	I		1146		135	Clayey SILT - brown [10YR 4/3], hard moist; trace fine- to medium-grained sand	ml		190 —	slot) 4 inch dia SCH 80 PVC from 160-190 5 feet
195		W-9d190	1154	15/19/24	137	Sandy SILT - dark clive brown [2 5Y 3/3] hard moist. Bottom at 193 feet	ml		195	
200 —							-		200 —	
205 —							į		205	
210 —									210	
215									215	
220 —									220	
225 —									225	
230 -		a .						1	230—	
235 —								ź	35—	
Remark	(s/N	otes: 1) PtD	Used:							Bogo

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8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well W-10

PROJECT: Sawyer Petroleum SURFACE ELEVATION: Not Measured

LOCATION: 14117 AETNA ST., VAN NUYS, CA TOTAL DEPTH: 191 5 feet BORING DIAMETER: 10 inches

PROJECT NO: 06.202 DEPTH TO FIRST SATURATION: 172.5 feet

DATE BEGAN: 9/29/06 FINISHED: 10/4/06 TOP OF WELL CASING ELEVATION: N/A

DRILLING COMPANY: Water Development Corporation STATIC GW ELEVATION: DATE: N/A

time or at any other location, there may be consequential changes in conditions

DRILLING METHOD: Hollow-Stem Auger LOGGED BY: E. Kuhn CHECKED BY: D. Henry

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of

DEPTH (feet)	Sample I.D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
5					AIRKNIFED TO 7 FEET			5	well box encased in concrete
10	W 10d10 W-10d15	0927	7/7/10 9/15/15	0.0	Clayey Sandy SILT - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel. Silty SAND - fine- to medium-grained dark brown [10YR 3/3], dense moist; trace amount of fine gravel	ml sm		10	
20	W-10d20W-10d25	0944	19/20/22 20/18/20	0.0	dark vellowish brown [10YR 3/4]. Clayey Silty SAND - fine- to medium-grained dark brown [10YR 3/3], dense. moist. Silty SAND - fine- to medium-grained, dark	sm		20	
30		0958	17/18/19	02	yellowish brown [10YR 3/4] dense moist Clayey SILT - very dark grayish brown [10YR 3/2], hard moist; trace fine- medium-grained sand; Clayey Silty SAND - fine- to medium-grained dark brown [10YR 3/3] dense moist; trace	ml sm		30 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	
40 -1	W-10d35 W-10d40	1008	13/15/15	00	amount of fine gravel. Silty SAND - fine- to medium-grained, dark brown [7 5YR 3/4], dense moist; trace amount of fine gravel. Clayey Sandy SILT - dark brown [10YR 3/3], very stiff, moist; fine- to medium-grained; trace amount of fine gravel. Silty SAND - fine- to medium-grained, dark	E E		40 40 41 11 11 11 11 11 11 11 11 11 11 11 11	blank 4 inch dia. SCH 80 PVC from 0-160 feet
50 -1	W-10d45 W-10d50	1028	13/15/15 21/28/35	35.8	yellowish brown [10YR 3/4] dense moist; trace amount of fine gravel. Clayey Silty SAND - fine- to coarse-grained dark brown [10YR 3/3], dense, moist. Silty SAND - fine- to medium-grained dark olive brown [2 5Y 3/3], dense, moist; dark yellowish brown [10YR 3/6], very dense trace amount of fine and coarse gravel;	sm sm		50 - 1 - 1 - 1 - 1 - 1 - 1 - 1	
Remarks/l	(Notes: 1)	PID Used:							Page 1 of 4



WAYNE PERRY, INC. 8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well W-10

PROJECT: Sawyer Petroleum

PROJECT NO: 06 202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/29/06

FINISHED: 10/4/06

2 of 4

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequented changes in conditions

				time or at ar	y other location, there may be consequential changes in con-	ditions.			
DEPTH (feet) Samples	Sample I D	Time	Blow Counts (per 6 inches)	(%/wdd) 197/OId	Geologic Description	Soil Class	Graphic Log	DЕРТН (feet)	Well Diagram
55 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	-10d100 -10d105 -10d110	11108 11115 1336 1352 1401 1441 1421 1438 1454	20/25/20 15/15/30 15/15/30 23/25/27 18/20/20 15/19/23 20/20/23	18.5 2.1 3.5 21.7 10.4 7.1 10.7	grayish brown [10YR 4/2] dense. moist; trace clay; SAND - fine- to medium-grained, grayish brown [10YR 5/2], dense, moist. Clayey SILT - olive brown [2 5Y 4/3], hard moist; trace amount of fine gravel Clayey Silty SAND - fine- to medium-grained, dark olive brown [2 5Y 3/3], dense, moist; trace amount of fine gravel. Silty SAND - fine- to medium-grained olive brown [2 5Y 4/4], dense, moist Clayey SILT with Sand - dark olive brown [2 5Y 3/3], hard, moist; fine - to medium-grained sand; trace amount of fine gravel. SAND - trace amount of fine gravel. Clayey SILT - dark olive brown [2 5Y 3/3], hard, moist; trace fine- to medium-grained; trace amount of fine gravel. Silty SAND - fine- to medium-grained, olive brown [2.5Y 4/4] dense, moist; trace amount of	E SE		55 60 65 70 75 80 85 90 95 10 11 11 11 11 11 11 1	neat cement from 1-151 feet
Remarks/Not	Remarks/Notes: 1) PID Used: Page								



8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well W-10

PROJECT: Sawyer Petroleum

PROJECT NO: 06 202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/29/06

FINISHED: 10/4/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

197	DEPTH (feet)	Samples	Sample I D.	Time	Blow Counts (per 6 inches)	(ppm/%)	Geologic Description Geologic Description Geologic Description Well Diagram Well Diagram
Silty SAND - fine - to carse-grained, dark velocity brown 10 PM dense moist, trace mid mid	20 1 1 1	± ×			<u> </u>		Silty SAND - fine- to coarse-grained dark olive brown [2.5Y 3/3], very dense, moist. Clayey SILT - very dark grayish brown [2.5Y 3/2] hard, moist; trace fine- to medium-grained sand. Clayey Sandy SILT - dark olive brown [2.5Y 3/3] hard, moist; fine- to medium-grained sand; trace
Sandy SiLT - dark brown [10/78 3/3] hard moist, fine- to medium-grained sand; trace amount of fine gravel; trace clay W-10d140 1431 52 4.1 Sitty SAND with Gravel - fine- to coarse-grained. dark clive brown [2 5Y 3/3] very dense, moist, fine land coarse gravel. SAND - fine- to coarse-grained, dark clive brownish gravel; yery dense moist, trace slit, trace amount of fine gravel. SILT - dark olive brown [2 5Y 3/3], hard moist; trace slit, trace amount of fine gravel. W-10d166 0865 20/26/28 0.3 Clayey SiltT - dark clive brown [2 5Y 3/3], hard mil mil moist; fine to medium-grained sand, trace clay W-10d166 0865 20/26/28 0.3 Clayey SiltT - dark clive brown [2 5Y 3/3] hard mil mil moist; fine to medium-grained sand, trace clay W-10d166 0865 20/26/28 0.3 Clayey SiltT - dark clive brown [2 5Y 3/3] hard mil moist; fine to medium-grained sand, trace clay W-10d170 0907 20/23/28 0.5	25 — 1		W 10d125	0844	20/23/20	2.6	Silty SAND - fine- to coarse-grained, dark yellowish brown [10YR 4/6] dense moist; trace amount of fine gravel. SAND with Silt and gravel - fine- to coarse-grained, olive brown [2 5Y 4/4] dense moist; fine gravel. SILT with Clay - dark olive brown [2 5Y 3/3], hard, moist, trace fine- to medium-grained sand; trace amount of fine gravel;
dark olive brown [2 5Y 3/3] very dense, moist; fine sp and coarse gravel SAND - fine- to coarse-grained, light brownish gray [2.5Y 6/2] very dense moist; trace silt; trace amount of fine gravel; SILT - dark olive brown [2.5Y 3/3], hard moist; trace fine- to medium-grained SILT with Clay - dark olive brown [2.5Y 3/3] very dense moist; trace fine- to medium-grained SILT with Clay - dark olive brown [2.5Y 3/3] very dense moist; trace fine- to medium-grained SILT with Clay - dark olive brown [2.5Y 3/3] very dense moist; trace fine- to medium-grained SILT with Clay - dark olive brown [2.5Y 3/3], hard mil SILT - dark olive brown [2.5Y 3/2], hard, moist SILT - dark olive brown [2.5Y 3/2], hard, moist SILT - dark olive brown [2.5Y 3/3], hard moist; fine to medium-grained sand; trace clay SILT - dark olive brown [2.5Y 3/3] hard moist; fine to medium-grained sand; trace clay SILT - dark olive brown [2.5Y 3/3] hard moist; fine to medium-grained sand; trace clay SILT - dark olive brown [2.5Y 3/3] hard moist; Very moist trace amount of fine gravel; SILT - dark olive brown [2.5Y 3/3] hard moist; Very moist trace amount of fine gravel; SILT - dark olive brown [2.5Y 3/3] hard moist; Very moist trace amount of fine gravel; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moist; SILT - dark olive brown [2.5Y 3/3] hard moi		*	W 10d135	1408	20/20/25	5.3	moist; fine- to medium-grained sand; trace amount
SILT with Clay - dark olive brown [2 5Y 3/3] very dense moist; trace fine- to medium-grained 150	5						dark olive brown [2 5Y 3/3] very dense, moist; fine and coarse gravel. SAND - fine- to coarse-grained, light brownish gray [2.5Y 6/2], very dense moist; trace silt; trace amount of fine gravel.
W 10d165 0812 20/25/30 1.6 Clayey Silfy SAND - fine- to medium-grained, very dark grayish brown [2.5Y 3/2], hard, moist 160 - 1 160 -			V 10d150	1512	25/28/30	2.8	trace fine- to medium-grained sand 150 — SILT with Clay - dark olive brown [2 5Y 3/3] very dense moist; trace fine- to medium-grained ——bentonite chips from
Sandy SILT - dark olive brown [2 57 3/3], hard moist; fine to medium-grained sand; trace clay W-10d165 0855 20/26/28 0.3 Clayey SILT - dark olive brown [2.5Y 3/3] hard moist; W-10d170 0907 20/23/26 0.5 very moist trace amount of fine gravel;		ָר ה	V 10d165	0812	20/25/30	1.6	Clayey Silty SAND - fine- to medium-grained, sm
Clayey SILT - dark olive brown [2.5Y 3/3] hard moist; W-10d170 0907 20/23/26 0.5 Clayey SILT - dark olive brown [2.5Y 3/3] hard moist; very moist trace amount of fine gravel;		₹ v	V-10d160	0835	20/19/27 —	2.9	moist, fine to medium-grained sand; trace clay
trace fine- to medium-grained sand trace fine- to medium-grained sand trace fine- to medium-grained sand 175 -							moist;
							trace fine- to medium-grained sand #2/12 sand filter pac from 155-191 5 feet



8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well W-10

PROJECT: Sawyer Petroleum

PROJECT NO.: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/29/06

FINISHED: 10/4/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

L	_			•	time or at ar	y other location, there may be consequential changes in c	onditions				
DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	(%/wdd) bb/\race{E}	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram	
180 —		W-10d175	0921	23/26/27	0.2	SiLT - dark olive brown [2 5Y 3/3]. hard. moist; trace clay	ml		180		
185 —		W-10d180	1013	25/25/30	- 0.0	SILT with Clay - dark olive brown [2 5Y 3/3] hard moist	ml		185	screened 90	02 inch
190 —		W 10d185	1038	20/23/31	0.0	Sandy SILT - dark brown [10YR 3/3] very hard moist; fine- to medium-grained sand; trace clay; trace amount of fine gravel	ml		190	screened 90 slots) 4 inch PVC from 16 feet	SCH 80 0-190 5
	- X	W-10d190	1058	 23/25/30 	0.0	Bottom at 191 5 feet	_				
195									195		
200									200		
205 —									205 —		
210 -									210		
215 —								2	215		
220 —								2	220		
225 —								2	25		
230 —								2	30		
235 —			!	3				2:	35		
							:		1		
Remark	s/No	otes: 1) PIC) Used:	<u>-</u>			· •	I	一	Page	

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WAYNE PERRY, INC. 8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352

Log of Boring/Well SVE-4

www.wpinc.com PROJECT: Sawyer Petroleum SURFACE ELEVATION: Not Measured BORING DIAMETER: 8/12 LOCATION: 14117 AETNA ST. VAN NUYS, CA TOTAL DEPTH: 155 feet DEPTH TO FIRST SATURATION: N/A PROJECT NO.: 06 202 TOP OF WELL CASING ELEVATION: N/A DATE BEGAN: 8/8/07 FINISHED: 8/8/07 DATE: N/A STATIC GW ELEVATION: DRILLING COMPANY: Test America LOGGED BY: A. Dollemore CHECKED BY: D. Henry DRILLING METHOD: Hollow-Stem Auger This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

DEPTH (feet)	Samples	Samp le I D	Time	Blow Cour (per 6 inch	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DЕРТН (feet)	Well Diagram
չ հղեկերև						ASPHALT, 4 inches. AGGREGATE BASE, 4 inches. SILT with Sand - very dark gray [5Y 3/1] stiff moist; with fine-grained sand;	ml		2 Մերկանի	well box encased in concrete — bentonite grout seal from 2.26 feet
10	Ţ	SVE-4d10	1330	7/8/10 	1.8	color change at 10 feet to very dark greenish gray			5 10 15 20 25 30 35 10 15 20 25 30 35 10 10 10 10 10 10 10 10 10 10 10 10 10	well box encased in concrete bentonite grout seal from 2 26 feet blank 2 inch dia. SCH 40 PVC from 0 5-30 feet bentonite chips from 26 29 feet
15 -	Ţ	SVE-4d15	1337	8/11/13	28	Sandy SILT - dark greenish gray [4/5GY] very stiff moist; with fine-grained sand;	mi		15 - 11111	
20 - 111	I	SVE-4d20	1346	9/11/14	00				8 11-1-11-11	
25 - 11	Ţ	SVE-4d25	1353	8/9/12 	00	color change at 25 feet to brown [10YR 5/3]	- <u>-</u> -		25	bentonite chips from
30 -	Į	SVE-4d30	1402	7/10/12	00	SILT - greenish gray [5/10Y] very stiff moist	113		30	26 29 feet #2/12 sand filter pack from 29-50 5 feet
35 111	I	 SVE-4d35	1411	11/13/14	0.0	SILT with Sand - olive [5Y 4/3] very stiff moist; with fine-grained sand.			35	nom 29-30 3 leet
40 11	Į.	SVE-4d40	1420	10/12/16	11 1	SILT - greenish gray [5/10Y], very stiff, moist; odor;	ml		11111111111111111111111111111111111111	
45 47	Ţ	SVE-4d45	1423	13/14/18	130	color change at 45 feet to olive gray [5Y 4/2];			1717 TT1711	40 PVC from 0 5-55 feet screened (0 02 inch slots) 2 inch dia. SCH 40 PVC from 30-50 feet
50	I.	SVE-4d50	1438	12/12/17	31 5	color change at 50 feet to olive [5Y 5/4] SAND - fine- to medium-grained, light olive	sp		8 8 8 8 4 The blitted debid detector	40 PVC from 30-50 feet bentonile chips from 50 5-54 feet
55 1	4	SVE-4d55	.1445	13/15/18	.89 Z	brown [2 5Y 5/4] dense moist; solvent odor Silty SAND - fine-grained, light olive brown [2 5Y 5/4] dense moist; solvent odor			1 TITLE	
60 -1	*	SVE-4d60	1153	14/14/18	181.3	Gravelly SAND - fine- to coarse-grained, with	- <u></u>		60	#2/12 sand filler pack from 54-75 5 feet
65 1111	I	SVE-4d65	1 500	15/16/20 — — — —	987.0	fine and coarse gravel, light brownish gray [2 5Y 6/2], dense, moist, strong solvent odor; no Encore Sandy SILT - light olive brown [5Y 5/4], hard	<u></u>		95 to	
70 -	1	SVE-4d70	1508	12/14/20 — — — —	203.0	moist; with fine-grained sand; solvent odor Gravelly SAND - fine- to coarse-grained, with				sols) 2 inch da. SCH 40 PVC from 55-75 feet
75	Y	SVE-4d75	1518	17/20/22	181 0	fine and coarse gravel, grayish brown [2 5Y 5/2] dense, moist; solvent odor. SILT - light yellowish brown [2 5Y 6/4] hard	ml		75	feet feet feet feet feet feet feet feet
80	Į	SVE-4d80	1530	15/19/21	37 7	moist_solvent odor Sandy SILT - light olive brown [2 5Y 5/6] hard moist_with fine-grained sand.	mi		75 75 80	40 PVC from 0 5-130 feet
85 —				<u> </u>			sp		85 —	2 (C//)

Remarks/Notes: 1) PID Used:

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8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well SVE-4

PROJECT: Sawyer Petroleum

PROJECT NO: 06 202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 8/8/07

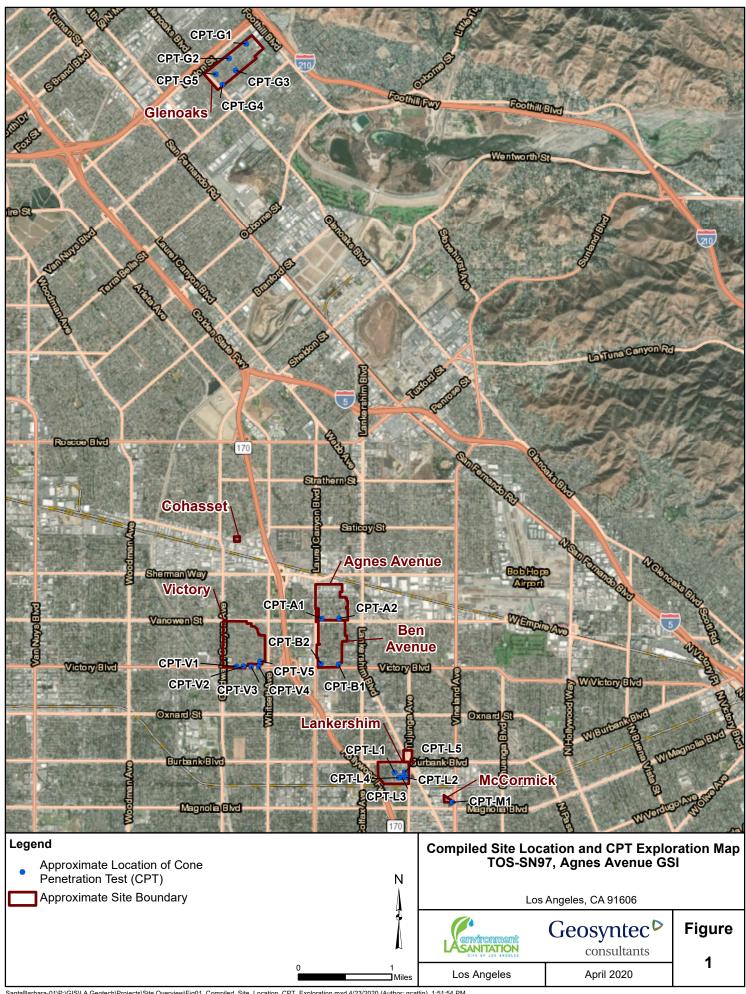
FINISHED:

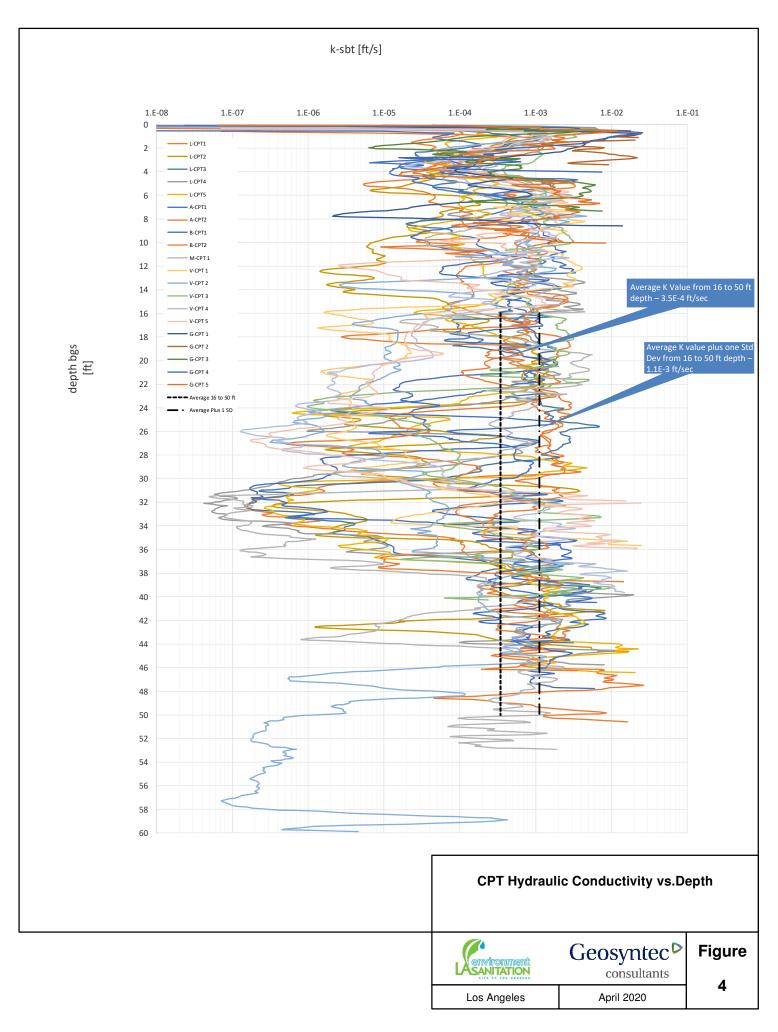
This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions

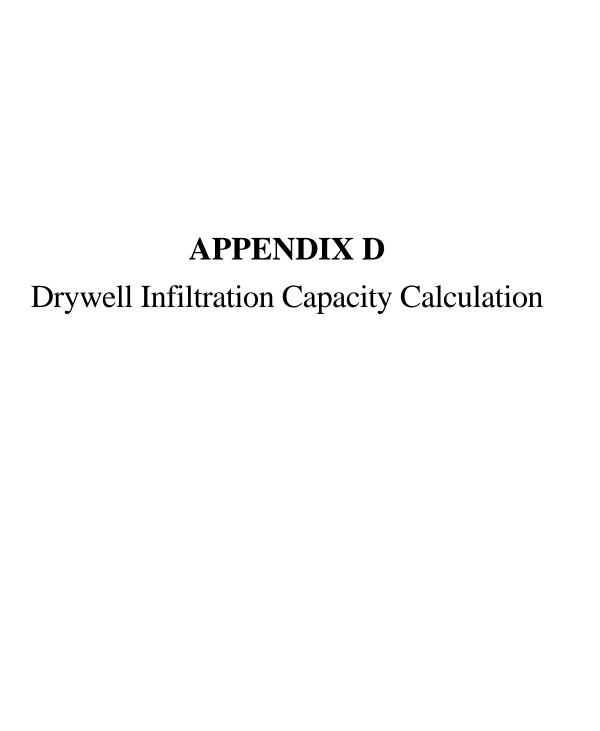
DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	We	ell Diagram
90 —		SVE-4d85 	1537 — — — — 1546	16/17/24 — — — — 15/18/25	41.8	SAND with Silt - fine-grained olive [5Y 5/3] dense moist; solvent odor SAND - fine-grained light gray [5Y 7/1] dense moist; solvent odor;			90		bentonite chips from 75 5-129 feet
95	Ţ	SVE-4d95	1555	18/19/28	97	with some silt at 95 feet			95		
100 —	_	SVE-4d100	1603		10 3	Silty SAND - fine-grained, olive gray [5Y 4/2] dense moist; solvent odor	sm		100		
105			 			Sandy SILT - dark yellowish brown [10YR 4/4] hard, moist; with fine- to coarse-grained sand	- mi -		105		
3	Ш	SVE-4d105 _	1612	15/20/25	28	SILT with Clay - olive [5Y 5/3]. hard moist;	mi		110		
110		SVE-4d110	1620	14/20/20	07						
115 —		SVE-4d115	1629	21/20/23	00	color change at 115 feet to light olive brown [2 5Y 5/4] trace fine-grained sand;			115		
120	I	SVE-4d120	1637 — — — —	13/17/20		no recovery at 120 feet	L		120		
125	I	SVE-4d125	1647	12/16/19	17	SILT - olive [5Y 4/4] hard moist;	mi		125		
130	I	SVE-4d130	1700	15/16/20	21	iron oxide mottling at 130 feet	 		130		
135	H	SVE-4d135	1708	13/16/23	00	Sandy SILT - olive [5Y 4/4], hard moist; with fine- to medium-grained sand	""		135		-#2/12 sand filler pack from 129-155 feet
140	豆	SVE-4d140	1715	11/12/17	08	SAND with Gravel - fine- to coarse-grained pale of ve [5Y 6/3], medium dense moist; with fine and	sp		140		
145	ī	SVE-4d145	1723	 14/15/16	37	coarse gravel. SILT - olive [5Y 5/3] hard moist: trace fine-grained sand	mi -		145		-screened (0 02 inch siots) 2 inch dia, SCH 40 PVC from 130-155
150	Į.	SVE-4d150	1731	15/17/20	28				150		feet
155	Ţ	SVE-4d155	1740	14/15/15	31	Bottom at 155 feet	<u> </u>		155		
160						Bottom at 100 lear			160		
165									165 —		
Libil									1411		
170 —									170 — 3		
175									175		
180									180		
1											
Remar	Remarks/Notes: 1) PID Used: Page 2 of 2										
										2	of 2

APPENDIX C

CPT Data from Victory Green Stormwater Infrastructure Project

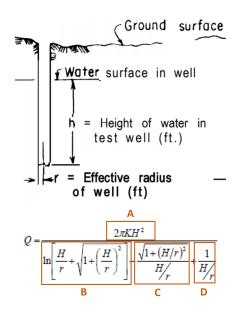








Description	Value	Unit	Equation/Note
Design input:			
	7.6E-04	ft/sec	Average (16 to 50 ft)
Saturated conductivity	4.04E-04	ft/sec	SD (16 to 50 ft)
	3.60E-04	ft/sec	average minus 1SD (16 to 50 ft)
Drywell design parameters:			
Chamber diameter	4	ft	D_c
Drywell diameter	4	ft	D_d
Drywell Radius	2	ft	$r = D_d/2$
Well screen depth	29	ft	L
Number of drywell	1		
Estimate infiltration rate using USBR			
<u>Method</u>			
Water Depth	29	ft	$H = L + d_p$
H/r	14.5		H/r
Term A	1.9		$A = 2*\pi*k_{sat}*H^2$
Term B	3.4		$B = ln(H/r + sqrt(1 + (H/r)^2))$
Term C	1.0		$C = sqrt(1+(H/r)^2)/(H/r)$
Term D	0.1		D = r/H
Drywell Infiltration Rate	0.78	ft3/sec	$Q_1 = A/(B-C+D)$, per dry well



APPENDIX E

Plate 1.2 Historically High Ground Water Contours and Borehole Locations

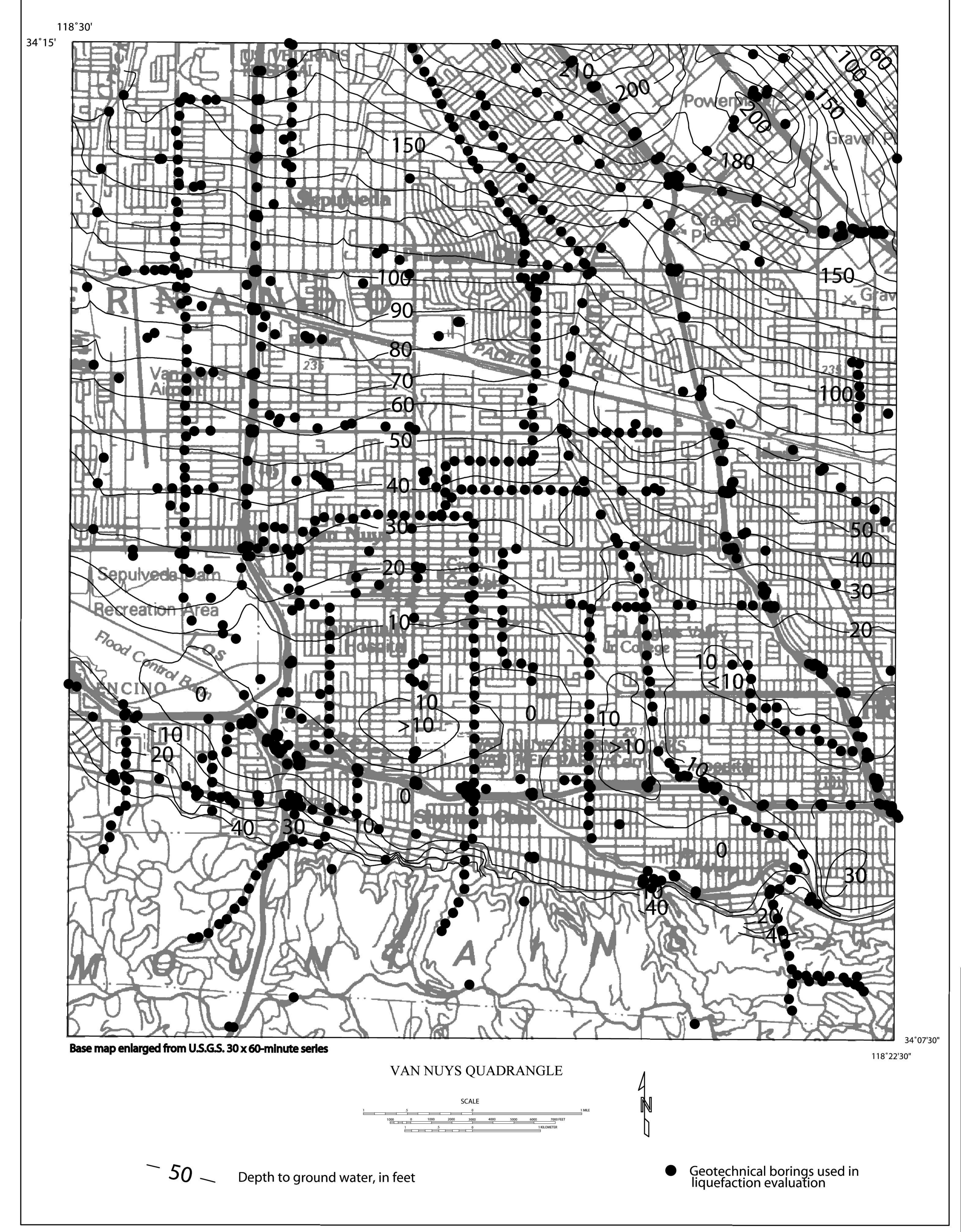


Plate 1.2 Historically High Ground Water Contours and Borehole Locations, Van Nuys 7.5-Minute Quadrangle, California

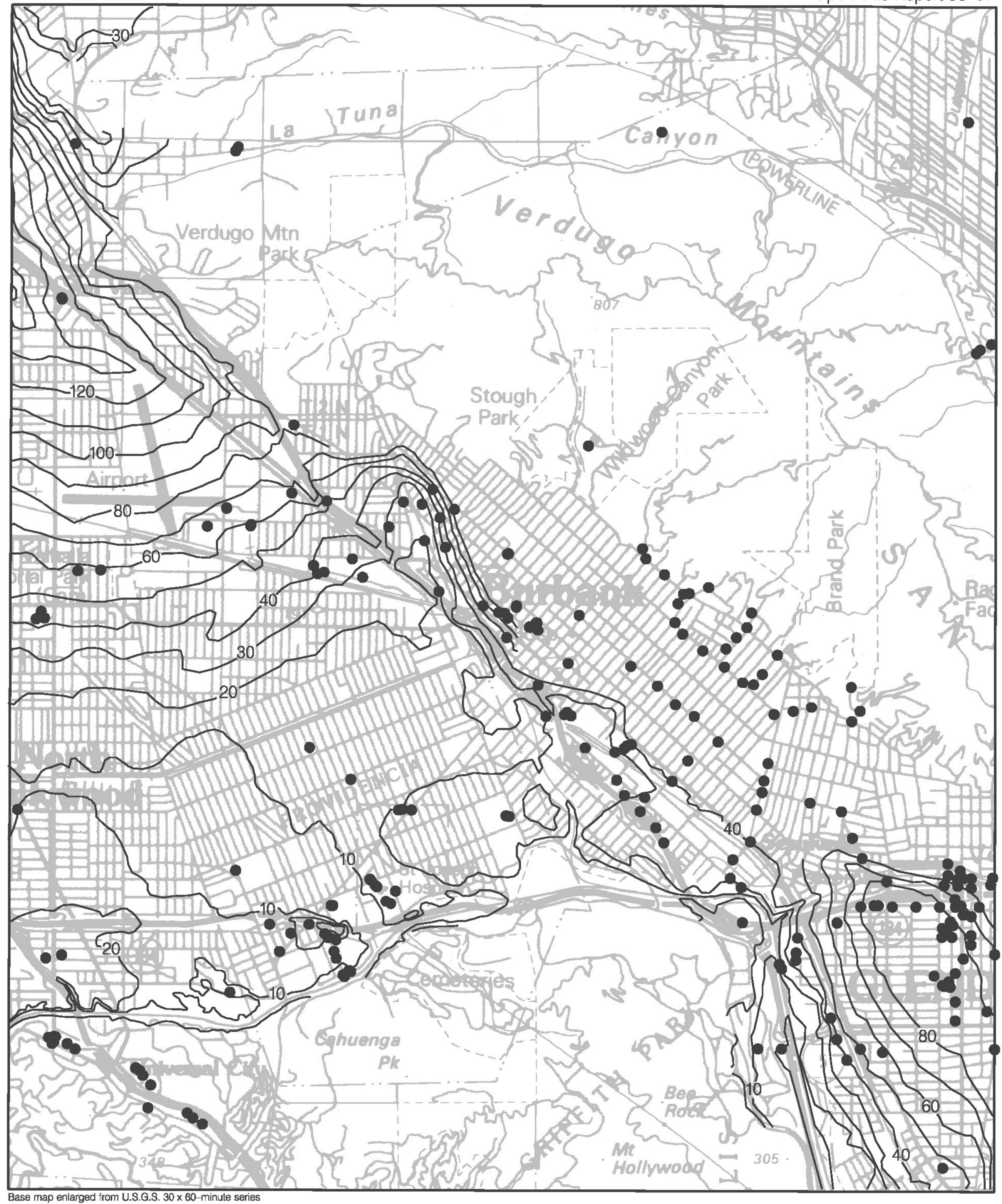


Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, Burbank Quadrangle.

Borehole Site
 ONE MILE
 SCALE

 Depth to ground water in feet

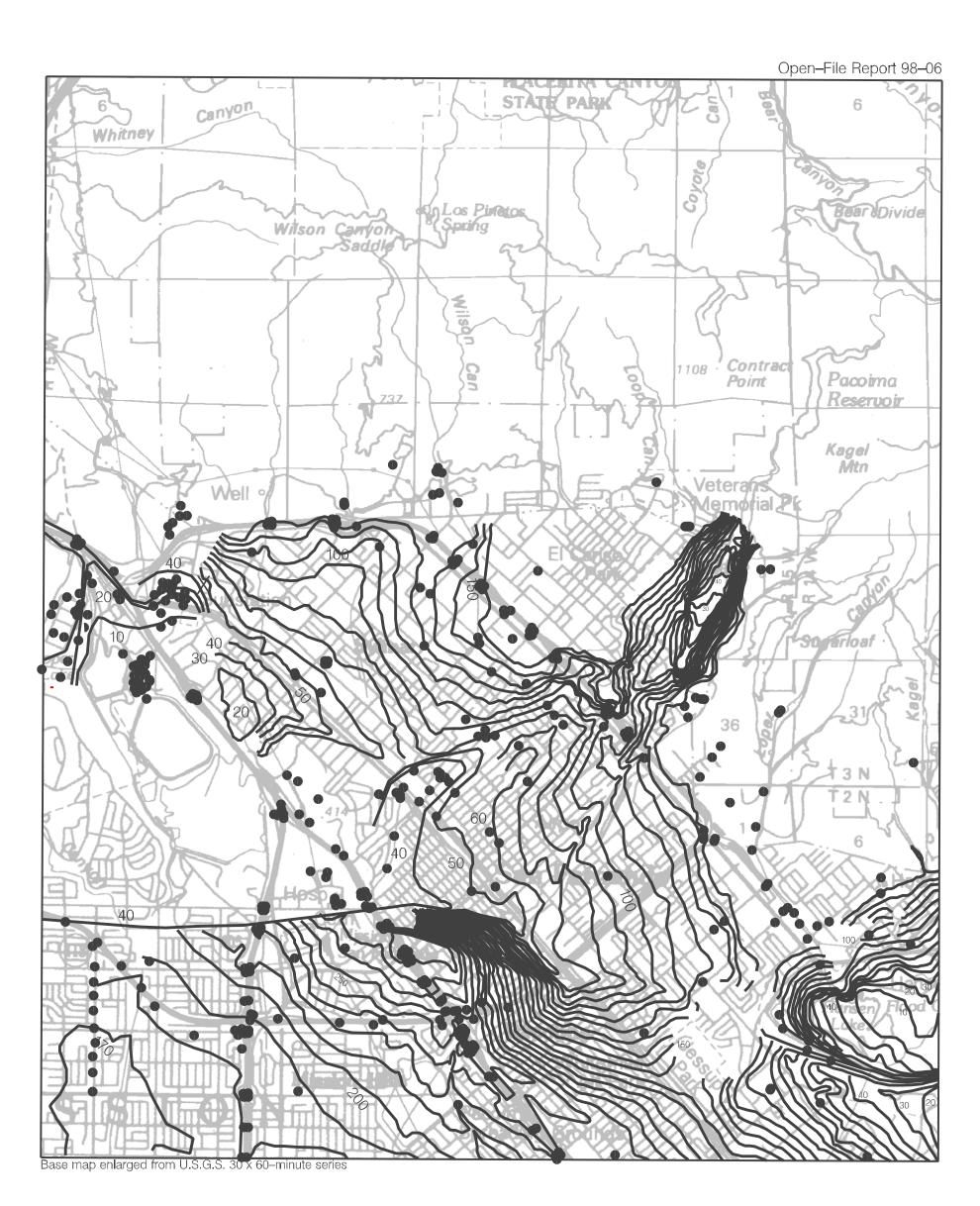


Plate 1.2 Historically Highest Ground-Water Contours and Borehole Log Data Locations, San Fernando Quadrangle.

Borehole Site
30 — Depth to ground water in feet
Site of historical earthquake—generated liquefaction. See "Areas of Past Liquefaction" discussion in text.

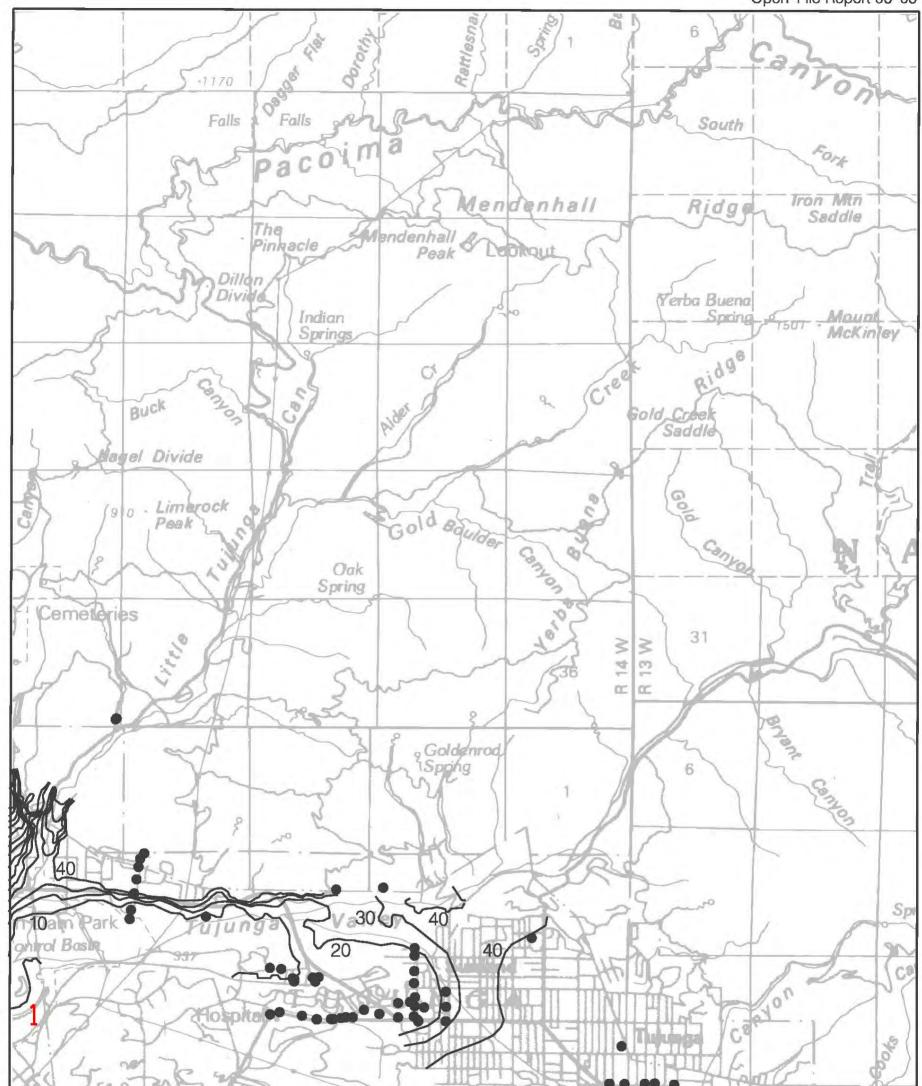


Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, Sunland Quadrangle.

Borehole Site
 Depth to ground water in feet

Base map enlarged from U.S.G.S. 30 x 60-minute series

1 Site of historical earthquake-generated liquefaction. See "Areas of Past Liquefaction" discussion in text.

SCALE

APPENDIX F

Metro Orange Line Improvement Sepulveda Station and Grade Separation – 30% Geotechnical Design Memorandum



Wood Environment & Infrastructure Solutions, Inc. 6001 Rickenbacker Road Los Angeles, CA 90040-3031 USA

T: +1 323.889.5300

www.woodplc.com

September 11, 2020 Wood Project 4953-18-0121

Mr. Rob Ball Mott MacDonald, LLC 1000 Wilshire Boulevard Suite 400 Los Angeles, California 90017

Subject: Letter of Transmittal

30% Geotechnical Design Memorandum Metro Orange Line Improvement Project Sepulveda Station and Grade Separation Van Nuys District, Los Angeles, California

Dear Mr. Ball

Please find attached our 30% Geotechnical Design Memorandum (GDM) for your review and comments before we formally submit.

Please call if you have any questions.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Jimmy Francisco
Technical Professional 3 - Geotechnical

Perry A. Maljian

Senior Principal Engineer







Metro Orange Line Improvement

Sepulveda Station and Grade Separation – 30% Geotechnical Design Memorandum

September 11, 2020

Mott MacDonald 1000 Wilshire Boulevard Suite 400 Los Angeles CA 90017 United States of America

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Los Angeles Metro

Metro Orange Line Improvement Project Sepulveda Station and Grade Separation 30% Geotechnical Design Memorandum

September 11, 2020

Los Angeles Metro

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
0	5/15/2019	HP/MK	MBH/PM/MK		
					IDR
1	5/28/2019	MK/HP	MBH		
					Draft for PE Submission
2	9/9/2020	MK/HP	PM		Draft Responses to Metro Comments

Document reference: 381630-WEI-01-XX-RP-GE-0003 |

Information class: Standard

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1 Introduction

1.1 General

This 30% Geotechnical Design Memorandum (GDM) has been prepared for the proposed Sepulveda Segment of the Los Angeles County Metropolitan Transportation Authority (Metro) Orange Rapid Bus Transit Line (MOL) Grade Separation project (Project) in the Van Nuys district of the City of Los Angeles, California. The purpose of this report is to provide interpretation of the subsurface soil and groundwater data and perform evaluation of geologic and seismic hazards affecting the project and engineering analyses to provide preliminary recommendations for the proposed structures. It is noted that the preliminary recommendations in this report are based on limited explorations that are commensurate with the objectives of this 30% design. Additional explorations should be performed in future phases of the project to develop more definitive recommendations for final design of the structures.

1

This evaluation is conducted under contract to Mott MacDonald LLC., by Wood Environment & Infrastructure Solutions, Inc. (Wood). Wood is the lead geotechnical consultant for this project. Earth Mechanics, Inc. (EMI) is performing the evaluation for the bridge structures for review and incorporation into the overall documentation by Wood.

The scope of this study did not include the assessment of general site environmental conditions for the presence of contaminants in the soils and/or groundwater. Additionally, this project team was informed that Metro would be performing that assessment under a separate contract. A 30% geotechnical data report (GDR) was submitted separately that presents the field and laboratory data collected to date for the Project.

1.2 Limitations and Basis for Recommendations

The professional services provided have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, express or implied, is made as to the professional advice included in this report. This report has been prepared by Wood/EMI for Mott MacDonald LLC., Metro, and their design consultants to be used solely in the preliminary evaluation of the proposed Sepulveda grade separation segment of the Metro Orange Line Improvement Project. This report has not been prepared for use by other parties and may not contain sufficient information for purpose of other parties or other uses.

In developing this GDM, Wood/EMI relied on subsurface information obtained in previous available investigations and available geologic publications. The information provided herein are for the purposes of preliminary (30% design) evaluation of the project segment. Subsurface conditions are, by their nature, uncertain and may vary from those encountered at the locations where visual inspections, borings, surveys, or other explorations were made. Additional explorations will be needed to support the final design phase of the project.

2 Project Description and Existing Site Conditions

In order to provide safer and improved operating speeds to the MOL Bus Rapid Transit (BRT) line as well as to meet the forecasted growing demand in ridership, Metro proposes various improvements along the 12.7-mile-long portion of the MOL bus transit alignment between the North Hollywood and Canoga stations. The proposed improvements include grade separations at major streets, minor street closures, and incorporation of four-quadrant gating systems at grade crossings. As an integral component of the comprehensive proposed MOL improvements, the current study will focus on the grade separation at Sepulveda Boulevard. The location of the current study is shown on Figure 1, Site Vicinity Map.

Based on 30% design drawings and profiles provided to Wood the proposed grade separation at Sepulveda Boulevard will be accomplished by constructing an aerial grade-separated guideway that consists of bridge structures and earth fill embankments. The earth fill embankments, which are anticipated to be retained by Mechanically Stabilized Earth (MSE) type retaining walls, are planned to have a maximum height of about 30 feet at both ends of the bridge structures and will have approach ramps at the west and east ends with a maximum slope of 3 percent. The aerial guideway will have a width varying from about 40 feet at its eastern and western termini to about 66 feet at the bridges, and extend from approximately 875 feet west of Sepulveda Boulevard to about 985 feet east of Sepulveda Boulevard, totaling approximately 1,860 feet in length (0.35 mile).

The proposed bridge structures consist of a multi-span aerial station at the Sepulveda Boulevard grade separation Furthermore, the planned grade separation will support conversion of the existing BRT to future light rail transit (LRT) if needed. The loads provided by the structural engineer have considered the maximum load from BRT and LRT, however, the design-builder should confirm the loads during the final design.

The existing MOL alignment is an at-grade roadway paved with asphalt-concrete or portland-cement-concrete dedicated for the BRT. The existing grade along the centerline of the current BRT slopes down from west to east with an elevation difference of 16 feet (Elevation 716 to 700 feet). Numerous underground utilities are currently located under the roadway as shown on the 15% Composite Utility Plans.

3 Relevant Geotechnical Data

Subsurface soil and groundwater data were available from previous geotechnical investigations in the project vicinity. Specifically, Wood's predecessor company LeRoy Crandall and Associates (LCA) performed a geotechnical investigation for a nearby site and presented the results in a report dated May 9, 1972 (LCA, 1972). In addition, the Earth Technology Corporation (ETC) performed a limited preliminary engineering study of the Metro Red Line Project and presented the results in a report dated December 10, 1993, which contains results of explorations performed along the Sepulveda Grade Separation segment currently being evaluated. Furthermore, Metro has completed a technical study for the conceptual planning of the Project; the study includes a preliminary geotechnical evaluation conducted by Diaz Yourman & Associates (DYA). The results of DYA's study were summarized in a report dated June 21, 2017. To supplement the prior data, two additional borings and four cone penetration tests (CPTs) were performed as part of this current study (30% design phase). The results of the prior and current field and laboratory testing were presented in the 30% final GDR dated November 8, 2018.

4 Geology

4.1 Geologic Setting

The planned Sepulveda Grade Separation is located in the south to southeastern portion of the San Fernando Valley. The San Fernando Valley is an east-west trending structural trough approximately 23 miles long (in the north-south direction) and 12 miles wide (in the east-west direction). Regionally, the San Fernando Valley is located in the Transverse Ranges geomorphic province. This province is characterized by east-west trending geologic structures such as the nearby Santa Monica Mountains and the active, east-west trending, San Fernando section of the Sierra Madre fault zone, located approximately 8 miles north of the planned Project. Tectonic deformation in the province is characterized by uplift of the Santa Monica Mountains to the south, the Santa Susana Mountains to the northwest, the San Gabriel Mountains to the northeast, the Simi Hills to the west, and the Verdugo Mountains to the east, all of which are sources of the sediments infilling the valley.

The location of the Project is at an approximate elevation of 700 to 715 feet above mean sea level (AMSL) (NAVD 88), sloping down to the east. The location of the Project in relation to regional topography is shown on Figure 2.

4.2 Geologic Materials

Localized fill materials were encountered in some of the previous borings up to a depth of 2½ feet below existing ground surface (bgs) (LeRoy Crandall, 1972, Diaz-Yourman, 2017) in the vicinity of the Project site. Localized fill materials were encountered in one of two exploratory borings currently drilled on the right of way to a depth of 4 feet bgs. The fill soils generally consisted of silty sand. Sand and gravel, reportedly railroad ballast, was also present in one of the prior borings (Earth Technology Corporation, 1993). Deeper fill soils may be present between boring locations.

The fill soils are underlain by Holocene-age alluvial fan deposits (Hitchcock and Wills, 2000). The alluvial deposits consist predominantly of sands and silty sands, and silts and clays with varying amounts of sand. The alluvial deposits encountered are predominantly fine grained in the upper 25 to 35 feet consisting of stiff silts and clay. Below approximately 30 to 35 feet, predominantly dense sand and silty sand with localized trace gravel and rare cobbles were encountered. Below approximately 55 feet some layers of stiff sandy silt and sandy clay are present within the dense sand and silty sand. The general stratigraphy appears to be similar between the borings as shown on Figure 3.

4.3 Groundwater

The Project is located in Section 4 of Township 1 North, Range 15 West, within the San Fernando Ground Water Basin (California Department of Water Resources, 2003). According to the Los Angeles Department of Public Works (County of LADPW, 2018), the closest well to the planned Sepulveda Grade Separation is Well 3732A located approximately 150 feet north of the Metro Orange Line right of way and 200 feet east of Sepulveda Boulevard (see Figure 3 for well location). Due to proximity of this well to the project, groundwater data from this well was considered in assessing the groundwater level fluctuations with time.

The most recent ground water measurement recorded for this well was a depth of 96.3 feet bgs (elevation 604.5) measured on September 28, 2008. The historic high for the well was

measured at a depth of 58 feet bgs (elevation 642.4) on September 12, 1956 and the historic low was 158.5 feet bgs (elevation 542.3) on October 17, 2000 during the monitoring period of 1956 – 2008 (note there are no readings for 2001 – 2007 and no readings after 2008). Groundwater was measured as high as 80.2 feet bgs (elevation 620.6) on March 25, 2008. Screen depths for Well 3732A were not available on either LA County Public Works or the California Department of Water Resources websites. However, considering the measured historic low groundwater depth of 158.5 feet bgs, it can be inferred that the well casing depth is at least160 feet bgs or more..

Groundwater elevations are plotted against rainfall amounts for the period of 1955 through 2018 on Figure 4. There is no apparent correlation between rainfall and groundwater elevations/depths. This is because groundwater levels are controlled by groundwater pumping throughout the San Fernando Ground Water Basin. Groundwater extraction from the basin was adjudicated in 1976 by the Superior Court for the County of Los Angeles and is heavily regulated and monitored.

Groundwater was also measured in previous boring LPE-10 at a depth of 77.4 feet bgs (elevation 627.6) on October 8, 1993 (Earth Technology Corporation, 1993) and was encountered in boring G-1 at a depth of 67 feet bgs (elevation 637.7) on October 11, 2018 and in boring G-2 at a depth of 67 feet bgs (elevation 636.1) on October 9, 2018.

Groundwater depth in Well 3732A was 142.4 feet bgs (elevation 558.4) on November 4, 1993, compared to groundwater measured in boring LPE-10 (located 335 feet to the southwest) at a depth of 77.4 feet bgs (elevation 627.6) on October 8, 1993. It therefore appears that the groundwater encountered in the borings is a perched condition. As the depth to groundwater was 67 feet in the 2018 boring, similar to the 77 feet depth measured in the 1993 boring, it appears that this perched condition has persisted through the present. Shallower perched groundwater conditions that may exist can be investigated when additional borings are drilled in future phases.

According to the California Division of Mines and Geology (CDMG, 2005), the historic high groundwater level in the area was around 15 feet bgs. This level is based on the 1944 groundwater elevation contours from California State Water Rights Board, 1962. Since that time, excessive pumping caused a regional drawdown of groundwater levels throughout the San Fernando Ground Water Basin. Although groundwater levels have increased since then, they have not recovered to 1940's levels. Figure 5 shows the groundwater storage capacity of the San Fernando Basin from 1928 through 2015. The upper regulatory storage requirement is significantly lower than the capacity when groundwater levels were at the high of 1944. The lower regulatory limit has only been achieved in 2 years since the adjudication of the water basin of 1976. Based on the goals and past performance for groundwater storage for the basin, groundwater levels are not anticipated to return to historical levels (i.e., 15 feet bgs) due to continued groundwater use during the design life of the Project.

5 Geologic and Seismic Hazards

5.1 Faults

Numerous faults in Southern California have been previously characterized as active or potentially active. The criteria for these major groups are based on criteria developed by the California Geological Survey (CGS), for the Alquist-Priolo Earthquake Fault Zoning Program (Bryant and Hart, 2007). According to Bryant and Hart, an active fault is one that has had surface displacement within Holocene time (about the last 11,000 years); and a potentially active fault is a fault that has demonstrated surface displacement of Quaternary age deposits (last 1.6 million years) (Jennings and Bryant, 2010, Bryant and Hart, 2007). More recently the CGS has revised fault activity designations for the purpose of the Alquist-Priolo (A-P) Earthquake Fault Zoning Program (CGS, 2018b). A Holocene-active fault is one that has had surface displacement within Holocene time (about the last 11,700 years). A pre-Holocene fault is a fault that has been demonstrated to not have Holocene surface displacement. An age-undetermined fault is one where the recency of fault movement has not been determined.

Many fault systems are considered to be active (Field et al., 2013) but are not included in an A-P Zone. A list of nearby active faults (those faults included in Field et al., 2013) and the distance in miles between the Project and the nearest point on the fault, the maximum magnitude, and the slip rate for the fault is given in Table 1. The faults in the vicinity of the Project (Jennings and Bryant, 2010) are shown in Figure 6, Regional Faults and Seismicity Map.

Major faults that contribute the most to ground shaking hazard at the site are the Compton Thrust fault, a blind thrust fault underlying the Project, the Northridge Hills Blind Thrust which was the source of the 1994 Northridge earthquake, the Hollywood fault, an east-west trending strike-slip to reverse oblique fault on the southern flank of the Santa Monica mountains, the Santa Susana fault, a northwest-southeast trending reverse-oblique fault approximately 9 miles to the north-northwest of the grade separation, and the San Andreas, a strike-slip fault approximately 30 miles to the north-northeast

5.2 Fault Rupture

The Project is not within a currently established Alquist-Priolo Earthquake Fault Zone (A-P Zone) for surface fault rupture hazard (CGS, 2018a; CGS, 2002). An A-P Zone is an area which requires investigation to evaluate whether the potential for surface fault rupture is present near an active fault (CGS, 2018b). An active fault is defined as a fault with surface displacement within the last 11,700 years (Holocene). The closest established A-P Zone with the potential for fault surface rupture is for the Sierra Madre fault zone, located approximately 11.8 miles east-northeast of the planned Sepulveda Grade Separation (CGS, 2018a). The closest Quaternary active fault is the Northridge Hills fault located approximately 2.1 miles to the north of the planned Sepulveda Grade Separation (CGS, 2018a, Jennings and Bryant, 2010; USGS-CGS, 2006; CGS, 2002).

Faults with the potential for surface rupture are not known to be located directly beneath or projecting toward the planned Sepulveda Grade Separation alignment. The potential for surface rupture along the planned Sepulveda Grade Separation alignment due to fault plane displacement propagating to the ground surface during the design life of the project is considered low.

Table 1. Major Holocene and Late Quaternary Faults in Southern California

Fault (by increasing distance from Project site)	Maximum Magnitude (Mw)	Fault Geometry	Slip Rate (mm/yr.)	Sources	Distance From Site (miles)	Direction From Site
Compton Thrust	6.8	ВТ	0.6	(a)	0*	-
Northridge Thrust	7.0	BT	1.5	(a)	2.1	N
Verdugo	6.9	RO	0.4	(a)	5.8	NE
San Fernando	6.7	RO	2.0	(a)	7.1	NNE
Hollywood	6.4	RO	0.9	(a)	7.3	SSE
Newport-Inglewood	7.1	SS	1.0	(a)	7.4	SSE
Santa Monica	6.6	RO	1.0	(a)	8.3	S
Santa Susana	6.7	RO	6.0	(a)	8.7	NNW
Simi-Santa Rosa	7.0	RO	0.7	(a)	10.4	NW
Anacapa-Dume	7.5	RO	0.4	(a)	10.5	SSW
Puente Hills Blind Thrust	7.1	BT	0.9	(a)	10.5	ESE
Upper Elysian Park Thrust	6.4	BT	1.9	(a)	10.7	ESE
Sierra Madre	7.2	RO	2.0	(a)	11.8	ENE
Raymond	6.5	RO	2.0	(a)	12.2	ESE
San Gabriel	7.2	SS	0.4	(a)	12.6	NNE
Malibu Coast	6.7	RO	0.3	(a)	14.4	SW
Holser	6.5	RO	0.4	(a)	16.6	N
Palos Verdes	7.3	SS	3.0	(a)	17.3	S
Oak Ridge	7.1	RO	4.0	(a)	21.5	NW
San Cayetano	7.0	RO	6.0	(a)	21.9	NW
Clamshell-Sawpit	6.5	RO	0.4	(a)	25.0	Е
Palos Verdes	7.3	SS	3.0	(a)	25.5	S
Duarte	7.2	RO	2.0	(a)	25.7	Е
Whittier	6.8	RO	2.5	(a)	26.7	SE
San Andreas	7.4	SS	34.0	(a)	30.4	NNE
San Jose	6.4	RO	0.4	(a)	34.7	ESE
Santa Ynez	7.1	SS	2.0	(a)	35.9	NW

⁽a) Cao et al., 2003; Field et al., 2013

SS Strike Slip

Reverse Oblique

Blind Thrust

^(*)Horizontal distance from thrust fault surface projection (upper limb)

5.3 Historic Earthquakes and Seismicity

The seismicity of the region surrounding the site was determined from research of an electronic database of seismic data (Southern California Seismographic Network, 2018). This database includes earthquake data compiled by the California Institute of Technology for 1932 through 2018 and data for 1769 to 1931 compiled by the CGS. The search for earthquakes that occurred within 100 kilometers of the site indicates that 457 earthquakes of Richter magnitude 4.0 and greater occurred from 1932 through 2018 and 36 earthquakes of magnitude 4.0 or greater occurred between 1769 and 1931 as tabulated on Table 2. Epicenters of some of the moderate and major earthquakes (magnitude 5.0 and greater) are shown in Figure 6.

Several earthquakes of moderate to major magnitude have occurred in the Southern California area within about the last 87 years. A partial list of these earthquakes is included in the following table.

Earthquake (Oldest to Youngest)	Date of Earthquake	Magnitude	Distance to Epicenter (miles)	Direction to Epicenter
Long Beach	March 11, 1933	6.4	48	SE
San Clemente Island	December 26, 1951	5.9	94	S
Tehachapi	July 21, 1952	7.5	65	NW
San Fernando	February 9, 1971	6.6	16	NNE
Whittier Narrows	October 1, 1987	5.9	24	SE
Sierra Madre	June 28, 1991	5.8	28	ENE
Landers	June 28, 1992	7.3	116	E
Big Bear	June 28, 1992	6.4	94	E
Northridge	January 17, 1994	6.7	5	NW
Hector Mine	October 16, 1999	7.1	128	ENE
Sierra El Mayor	April 4, 2010	7.2	242	SE
La Habra	March 28, 2014	5.1	36	SE
Borrego Springs	June 10, 2016	5.2	127	SE
Channel Islands	April 5, 2018	5.3	76	SW

Table 2. List of Historic Earthquakes

5.4 Seismic Ground Shaking

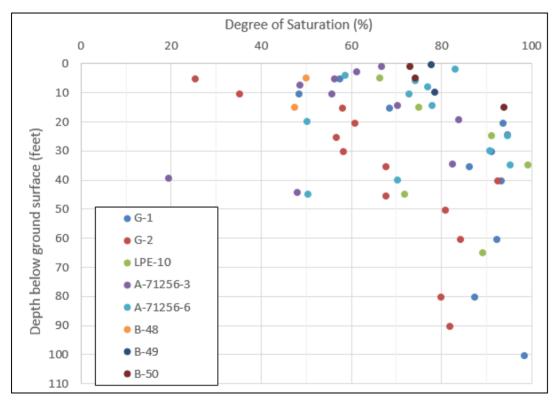
The proximity of the Project alignment relative to known active faults indicates the planned Sepulveda Grade Separation could be subjected to significant ground shaking in the event of an earthquake. This hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

5.5 Liquefaction and Seismic Induced Settlement

Liquefaction potential is greatest where the depth to ground water is shallow, and submerged, loose, fine sands occur within a depth of about 50 feet or less. Liquefaction potential decreases as grain size and clay and gravel content increase. As ground acceleration and shaking duration increase during an earthquake, liquefaction potential increases. According to the City of Los Angeles Safety Element (1996, accessed 2018) and the County of Los Angeles General Plan (2015), and the California Geological Survey [(California Division of Mines and Geology (CDMG), 1998], the Project alignment is within an area identified as potentially liquefiable as shown on Figure 7, Liquefaction Hazard Map. Therefore, a site-specific liquefaction evaluation was performed for the project.

The Metro Rail Design Criteria, Metro Supplemental Seismic Design Criteria (MRDC, 2017), Section 5 Appendix, Section 3A13.0, states that liquefaction susceptibility shall be determined using the procedures documented in Article 10.4 and 10.5.4 of the AASHTO-CA LRFD BDS. The referenced procedures indicate that the liquefaction potential should be evaluated based on the "anticipated" groundwater elevation. As a general practice in California, the historic-high groundwater level is used for this purpose. However, in some areas of California where the groundwater level has remained at a significantly deeper level for a long time duration (decades), and there is reason to believe that the management of the groundwater basin of the site would not allow groundwater to rise to the historic-high level in the anticipated design life of the Project, then in those cases a level deeper than the historic high level is sometimes used in the liquefaction evaluation (see additional discussion regarding groundwater regulation in Section 4.3).

In addition, it should be noted that soil layers that are saturated or are anticipated to be saturated in the future, whether below the groundwater level, or within a perched water zone underlain by less permeable materials, should be evaluated for liquefaction potential. Based on the laboratory results of samples obtained from borings along and near the alignment of the Project, the degree of saturation was estimated assuming a specific gravity of 2.7 for each undisturbed sample as presented below. As seen in the plot below, at depths shallower than 50 feet, the soils (at the time of sampling) were not consistently near saturated levels, indicating that the true static groundwater level is below this depth.



According to the California Geological Survey (CGS) 1997 Seismic Hazard report for the Van Nuys 7.5-Minute Quadrangle (revised 2001), the historically highest groundwater level in the area is between 10 and 20 feet bgs (15 feet bgs is taken as the average historic high depth along the Project alignment). The CGS report states that the historically highest groundwater level is based on the 1944 groundwater elevation contours when groundwater levels reportedly reached their highest level before excessive pumping caused drawdowns throughout the basin.

CGS also states that the "measured groundwater levels in the 1970's, 1980's and 1990's tend to be 10 to 20 feet deeper than the 1944 water level." Therefore, a reasonable level for the anticipated (i.e. design) groundwater depth is taken as 35 feet bgs (corresponding to 20 feet deeper than CGS historically highest groundwater depth of 15 feet bgs) for the purpose of liquefaction evaluation. Based on the nearby Well 3732A, which measured the groundwater table at much greater depths during the same time period, a groundwater depth of 35 feet bgs represents a perched groundwater condition. Considering that the measured groundwater depth is currently about 70 feet bgs from recent borings/wells and the fact that the highest groundwater level measured in nearby Well 3732A is at 96.3 feet bgs, it is our opinion that an anticipated design groundwater depth of 35 feet bgs for the project is conservative, but reasonable for the purpose of liquefaction evaluation, especially considering the upper 30 to 40 feet of soils (or the upper 35 feet of soils on average) are clayey and not susceptible to liquefaction (see Section 4.3 for further discussion of groundwater levels measured in well, rainfall data and groundwater storage capacity of the San Fernando Basin).

A list of the explorations used in the liquefaction evaluation is presented below.

Exploration	Exploration Depth
Identification	(feet, bgs)
G-1	100.5
G-2	100.5
LPE-10	85.5
CPT-1/1A	86/95.3
CPT-2	100.1
CPT-3	100.1
CPT-4	95.3
CPT-4A	95.3

Note: Borings B-48, B-49, B-50, A-71256 (3) and A-71256 (6) were excluded from analyses as they were either too shallow (less than 50 feet) or did not have blowcount data.

The liquefaction potential was evaluated using the Youd and Idriss, 1997 (NCEER Technical Report 97-0022) consensus publication on liquefaction evaluation, and Youd et al., 2001 summary report from 1996 NCEER and 1998 NCEER/NSF workshop on evaluation of liquefaction resistance of soils and methodology described in Idriss-Boulanger (2008) and Bray-Sancio (2006) for liquefaction susceptibility evaluation of fine-grained soils. The liquefaction analyses was performed for the three design earthquakes and for two groundwater level scenarios. The design earthquake events were ODE, MDE and Caltrans 975-year design event (see Sections 7.1 and 7.2); the governing earthquake magnitude and PGA associated with these hazard levels are discussed in Table 7. We considered two groundwater level scenarios in our analysis (1) CGS historically highest groundwater depth of 15 feet bgs and (2) anticipated design groundwater depth of 35 feet bgs. However, it is noted the results are similar for the two assumed depths as the soils within the upper 30 to 40 feet of the ground surface are predominately clayey based on visual inspection and laboratory testing.

Based on the SPT-based liquefaction evaluation and design PGA's and magnitudes in Table 7, two current borings (G-1 and G-2) did not indicate liquefaction potential; prior boring LPE-10 indicated liquefaction-induced ground settlement of about 1½ inches for MDE and for Caltrans 975-year design event and none for ODE event. The CPT-based liquefaction evaluation results in a maximum settlement of 2 to 3.5 inches for MDE, less than ¼ inch for ODE and less than 1.5

inches for the Caltrans 975-year design event. Although the soil classification in the CPTs for the potential liquefaction layers somewhat matches those in the adjacent borings, the corrected SPT blow count for those layers is 50 blows per foot (bpf) or greater resulting in no computed liquefaction settlement. If based on uncorrected (field) blow count, the only potential zone appears to be a layer of silty sand between depths of 35 and 40 feet bgs where the uncorrected SPT blow count was 30 bpf and this layer contributes about 1 inch of settlement. It is recommended that additional borings with SPT sampling and CPTs be performed in future phases of the Project investigation to further evaluate liquefaction potential and liquefaction-induced settlement. For the purpose of preliminary design, liquefaction-induced settlement is taken as 1 inch total and ½ inch differential over a horizontal distance of 50 feet and the depth of impact on pile foundations is 35 feet, assuming the groundwater level will rise to CGS historically highest groundwater level of about 15 feet bgs.

Seismically-induced dry settlement is often caused by loose to medium-dense granular soils densified during ground shaking. Uniform settlement beneath a given structure would cause minimal damage; however, because of variations in distribution, density, and confining conditions of the soils, seismically-induced settlement is generally non-uniform and can cause serious structural damage. Dry and partially saturated soils as well as saturated granular soils are subject to seismically-induced settlement. The soils above the groundwater level (CGS historic-high of 15 feet bgs or design water level of 35 feet bgs) are primarily fine-grained and clayey and, therefore, the seismically-induced settlement is considered negligible for all three design events.

5.6 Slope Stability

Topographically, the Project alignment is relatively level, sloping from approximately Elevation 715 feet at the west to Elevation 700 feet at the east over the ½ mile of Project alignment. There are no known landslides near the Project alignment, nor is the alignment in the path of any known or potential landslides according to the CGS (CGS, 2018c). The Project alignment is not within an area identified as having a potential for earthquake-induced landslides (CDMG, 1998).

5.7 Tsunamis, Inundation, Seiches, Flooding and Subsidence

The Project alignment is not in a coastal area and at an approximate mean elevation of 700 feet. Therefore, tsunamis (seismic sea waves) are not considered a hazard along the Project alignment.

According to the City of Los Angeles Safety Element (1996) and the County of Los Angeles General Plan (2015), the Project alignment is located within a potential inundation area for an earthquake-induced dam failure from the Lopez, Pacoima, and Hansen Dams. However, these dams, as well as others in California, are continually monitored by various governmental agencies (such as the State of California Division of Safety of Dams and the U.S. Army Corps of Engineers) to guard against the threat of dam failure. Catastrophic failure of a major dam as a result of a scenario earthquake is regarded as unlikely. Current design and construction practices, and ongoing programs of review, modification, or total reconstruction of existing dams are intended to ensure that all dams are capable of withstanding the maximum magnitude earthquake. Therefore, the potential for inundation along the alignment as a result of an earthquake-induced dam failure is considered low.

The Project alignment is in an area of minimal flooding potential (Zone X). Zone X, as defined by the Federal Emergency Management Agency (FEMA, 2008), is an area outside of the 0.2% annual chance flood. Therefore, the potential for flooding along the alignment is considered low.

The Project alignment is not located within an area of known ground subsidence associated with groundwater withdrawal, peat oxidation or hydro-compaction. Therefore, the potential for subsidence to affect the Project is low.

5.8 Oil Wells and Methane Gas and Subsidence

According to the California Division of Oil, Gas, and Geothermal Resources (DOGGR) Well Finder System, the Project alignment is not situated in an oil field and there are no known oil wells in the area (DOGGR, 2018).

The Project alignment is in a methane zone according to the City of Los Angeles (ZIMAS, 2018). Therefore, the risk of encountering methane must be considered. Metro has decided to advance the geotechnical design from 30% to 100% design through design-build procurement process, therefore, the potential for methane gas should be considered and further evaluated in the final design.

5.9 Scour

This Project alignment does not cross a channel, basin or streambed that conveys water, and most of the water sources in the vicinity of the project are confined in engineered facilities. Therefore, scour is not considered a design issue for the Project.

5.10 Geologic Conclusions

Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located beneath or projecting toward the Project alignment. The potential for surface rupture at the site due to fault plane displacement propagating to the ground surface during the design life of the Project is considered low. Although the Project could be subjected to strong ground shaking in the event of an earthquake, this hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

Based on the analyses, the total and differential liquefaction-induced settlement be taken as 1 inch and ½ inch over a horizontal distance of 50 feet, respectively. It is recommended that additional borings with SPT sampling and CPTs be performed in the future phases of the project to arrive at a final value for design. The seismically-induced (dry) settlement is considered negligible for all three design events.

The Project alignment is relatively level and the absence of nearby slopes precludes slope stability hazards. The potential for other geologic hazards such as tsunamis, inundation, seiches, flooding, and subsidence affecting the alignment is considered low. The project alignment is in a methane zone according to the City of Los Angeles (ZIMAS, 2018). Therefore, the risk of encountering methane must be considered, especially as related to enclosed rooms or vaults that may be associated with the Project.

6 Corrosion Evaluation

Laboratory soil corrosivity testing was performed by ETC on a sample obtained at a depth of 15 feet below the surface grade from one of the ETC borings (LPE-10) drilled in the project vicinity. The sample was collected in clayey soils and the test results indicated the soils are moderately corrosive to ferrous metals and that the potential for sulfate attack on portland cement concrete is consider negligible.

The 2017 DYA report also states that corrosion tests were performed on six soil samples collected from the upper 40 feet of the on-site soil along the MOL alignment. The test data by indicated that the clayey soils encountered in the upper 20 feet below the surface grade were generally corrosive to buried metal and the soils below that depth are non-corrosive to buried metal based on Caltrans (2018a) and County of Los Angeles (2013) criteria. The test results also indicate that the sulfate content of these soils were generally below the threshold for soils that are considered corrosive to concrete.

In addition, soil corrosivity testing was performed on five soil samples collected from depths of 5.5 to 70 feet from recently drilled borings G-1 and G-2. Following Caltrans Corrosion Guidelines (version 2.0, 2019), the test data indicates that the soils are moderately corrosive to corrosive to ferrous metals and that the potential for sulfate attack on portland cement concrete is considered negligible.

In summary, all currently available corrosivity test data indicates that the soils are moderately corrosive to corrosive to ferrous metals and not corrosive to concrete. Additional corrosion testing should be performed in future investigation phases to make a final determination of soil corrosivity. Necessary corrosion protection for concrete and metal structures in contact with soil as required by Metro and Caltrans Standards should be provided.

Metro has decided to advance the geotechnical design from 30% to 100% design through design-build procurement process, therefore, the potential for soil corrosivity should be further evaluated in the final design.

7 Ground Motion Evaluation

The Project is located in seismically active southern California and is subject to shaking from both local and distant earthquakes. The following sections provide the design acceleration spectra computed in accordance with procedures in Caltrans Seismic Design Criteria (version 2.0 dated April 2019) which is applicable for the bridge structures and procedures in Metro Rail Design Criteria (Revision 12 dated November 20, 2017) are applicable to the aerial guideway structures including MSE walls and bridge structure, however in no case shall the seismic design results in performance less than that required by AASHTO-CA LRFD BDS (2012). Furthermore, the peak ground accelerations (PGAs) considered in the evaluation for liquefaction potential and seismically induced settlement for the hazard levels considered are also presented in this section.

The acceleration response spectra (ARS) were calculated at the grade separation proposed at Sepulveda Boulevard. The key parameters used in determining the ground motion response spectra are listed in Table 3.

Table 3. Key Parameters for Determining Preliminary ARS Curve

Structure	Site Co	ordinates	Shear Wave Velocity	
Structure	Latitude	Longitude	V_{s30}	
Sepulveda Blvd. Bridge	34°10'49.82"N	118°27'58.37"W	350 m/sec	

The seismic shear wave velocity measurements were collected in CPT-2 and CPT-4A performed during this investigation. The shear wave velocity profiles with depth between the two locations was similar and therefore the average of the two profiles was taken as the idealized shear-wave velocity for the Project. The average shear wave velocity within 100 feet of the ground surface (30 meters) was estimated as 350 meters per second and was used in the ground motion evaluation for this segment. The depth to a shear wave velocity of 1,000 meters per second beneath the site ($Z_{1.0}$) and depth to a shear wave velocity of 2,500 meters per second ($Z_{2.5}$) were taken as 300 meters and 2.25 kilometers, respectively, from the latest Southern California Earthquake Center (SCEC) Community Velocity Model.

7.1 Caltrans Design Acceleration Response Spectra

The design acceleration response spectra were computed using the Caltrans ARS web-based tool following procedures in Appendix B of the Caltrans seismic design criteria (2019). The ARS web tool calculates both deterministic and probabilistic spectra. The deterministic spectra is computed as the average of the median response using two of the Next Generation Attenuation ground motion prediction equations (GMPEs), namely Campbell-Bozorgnia (2008) and Chiou-Youngs (2008) relationships and for faults considered to be active and those that are capable of producing a moment magnitude earthquake (Mw) of 6.0 or greater. In order to account for potential earthquakes on unknown faults, a statewide minimum deterministic spectrum for a scenario of 6.5 magnitude vertical strike slip event occurring at a distance of 12 kilometers (7.5 miles) is also considered.

The nearest substantial local sources of earthquakes are provided in Table 4 along with their deterministic response spectrum according to the Caltrans Fault Database (Merriam, 2012). The

site-to-fault distances and deterministic Peak Ground Accelerations (PGA) were determined using Caltrans ARS Online V2.3.09 (2017).

Table 4. Caltrans ARS Response Spectra

Period	Minimum Deterministic Spectrum	Anacapa- Dume alt 1 Final Spectrum	Northridge Hills Final Spectrum	Verdugo- Eagle Rock Final Spectrum	Probabilistic Final Spectrum	Envelope
(sec)	SA (g)	SA (g)	SA (g)	SA (g)	SA (g)	SA (g)
0.010	0.225	0.430	0.368	0.300	0.663	0.663
0.050	0.283	0.543	0.457	0.373	1.021	1.021
0.100	0.420	0.768	0.629	0.536	1.229	1.229
0.150	0.503	0.914	0.738	0.638	1.395	1.395
0.200	0.522	0.962	0.785	0.671	1.525	1.525
0.250	0.505	0.949	0.781	0.659	1.507	1.507
0.300	0.483	0.921	0.760	0.638	1.492	1.492
0.400	0.432	0.841	0.704	0.583	1.353	1.353
0.500	0.378	0.762	0.631	0.522	1.254	1.254
0.600	0.324	0.703	0.571	0.476	1.108	1.108
0.700	0.283	0.657	0.525	0.440	1.046	1.046
0.850	0.237	0.597	0.465	0.396	0.944	0.944
1.000	0.202	0.547	0.416	0.359	0.857	0.857
1.200	0.165	0.454	0.338	0.296	0.699	0.699
1.500	0.127	0.351	0.254	0.228	0.544	0.544
2.000	0.088	0.229	0.168	0.156	0.395	0.395
3.000	0.051	0.118	0.094	0.092	0.237	0.237
4.000	0.035	0.075	0.062	0.064	0.165	0.165
5.000	0.026	0.058	0.046	0.048	0.135	0.135

The probabilistic spectrum is obtained from the 2008 USGS National Hazard Map for 5% probability of exceedance in 50 years (or for an event with a return period of 975 years). Since the USGS probabilistic spectrum is computed for site class B (V_{s30} = 760 meters per second), the spectrum is adjusted for site class by multiplying the spectral ordinates with site amplification factors used by the USGS map. The amplification factor was computed as 1.0 for the site. Furthermore, due to the proximity of the project to active faults, both the deterministic and probabilistic spectra are adjusted for near-source directivity; the adjustment factor per Caltrans SDC for deterministic spectrum is taken as 1.2 for spectral periods longer than one second and linearly tapering to zero at a period of 0.5 second. For applying near-source directivity factors to probabilistic spectra, a hazard disaggregation was performed to evaluate the hazard contribution of faults within 25 kilometers to the overall hazard and that factor was computed as 0.94 (see Section 7.2) and applied to the near-source directivity factors specified by Caltrans for the deterministic spectra.

The final Caltrans design spectrum is taken as the larger of the deterministic and probabilistic spectra as presented in Table 4. The probabilistic response spectrum controls the Caltrans ARS curve as shown in the table. The preliminary ARS curve is presented in attached Figure 8.

7.2 Design Acceleration Response Spectra for MDE and ODE

As stated in Section 2.3.2 of the Metro Rail Design Criteria (MRDC) dated November 20, 2017 (Revision 12), seismic design of aerial and surface structures should be based on two hazard levels as described below.

- (1) Operating Design Earthquake (ODE) defined as an earthquake event likely to occur only once in the design life, where structures are designed to respond without significant structural damage. The current Metro Code defines ODE as an event with a 50% probability of exceedence in 100 years (corresponding to a return period of 150 years).
- (2) Maximum Design Earthquake (MDE) defined as an earthquake event with a low probability of occurring in the design life, where structures are designed to respond with repairable damage and to maintain life safety. The current Metro Code defines MDE as an event with a 4% probability of exceedence in 100 years (corresponding to a return period of 2,475 years).

The performance objectives for the ODE and MDE events are described in Section 3A3.0 of the MRDC – For ODE, the structures shall be designed to respond in elastic manner and there shall be no collapse but minor damage that is easily repairable such that the structure is fully operational immediately after the earthquake. For MDE, the structures are expected to behave in an inelastic manner, but no collapse is allowed and any structural damage may be limited to elements that visible and can be readily repairable. Furthermore, it is stated that the design shall in case result in a seismic performance that is less than that required by AASHTO-CA LRFD BDS (see Section 7.1).

Probabilistic seismic hazard analyses were conducted using the USGS Unified Hazard Tool (2018) and the Dynamic: Conterminous U.S. 2014 (v4.1.1) model. Since the USGS web-based tool provide spectral ordinates at specific periods (0.01, 0.2, 1 and 2 seconds), a calculation using the computer program openSHA (Field et. al., 2013) using parameters mirroring those used in the USGS tool evaluation was performed to provide more points on the spectrum.

The probabilistic spectra thus obtained was corrected for basin amplification and near-source directivity effects. For applying near-source directivity factors to probabilistic spectra, a hazard disaggregation was performed to evaluate the hazard contribution of faults within 25 kilometers to the overall hazard and that factor was computed as 0.94 and applied to the near-source directivity factors stated in the earlier section to arrive at the adjusted factors presented in Table 5. The preliminary peak ground acceleration (PGA) (taken as the spectral acceleration at a period of 0.01 second), and spectral response accelerations at periods through 5.0 seconds period for the MDE and ODE hazard levels are presented in Table 5 and 6 and Figures 9 and 10, respectively.

Table 5. Acceleration Response Spectrum for MDE

Period	Sepulveda Blvd. Bridge MDE UHS	Basin Factor	Near Fault Factor Adjusted for Disaggregation	Adjusted Sepulveda Blvd. Bridge MDE UHS
(sec)	SA (g)	-	-	SA (g)
0.01	0.957	1.00	1.00	0.957
0.05	1.199	1.00	1.00	1.199
0.10	1.791	1.00	1.00	1.791
0.15	2.077	1.00	1.00	2.077
0.20	2.221	1.00	1.00	2.221
0.25	2.289	1.00	1.00	2.289
0.30	2.304	1.00	1.00	2.304
0.40	2.169	1.00	1.00	2.169
0.50	1.995	1.00	1.00	1.995
0.60	1.807	1.00	1.00	1.807
0.70	1.619	1.00	1.02	1.643
0.85	1.389	1.00	1.07	1.488
1.00	1.184	1.00	1.17	1.386
1.20	1.014	1.00	1.13	1.143
1.50	0.757	1.00	1.13	0.854
2.00	0.533	1.00	1.13	0.601
3.00	0.323	1.00	1.13	0.365
4.00	0.221	1.00	1.13	0.249
5.00	0.165	1.00	1.13	0.186

Table 6. Acceleration Response Spectrum for ODE

Period	Sepulveda Blvd. Bridge ODE UHS	Basin Factor	Near Fault Factor Adjusted for Disaggregation	Adjusted Sepulveda Blvd. Bridge ODE UHS
(sec)	SA (g)	-	•	SA (g)
0.01	0.359	1.00	1.00	0.359
0.05	0.448	1.00	1.00	0.448
0.10	0.679	1.00	1.00	0.679
0.15	0.812	1.00	1.00	0.812
0.20	0.854	1.00	1.00	0.854
0.25	0.852	1.00	1.00	0.852
0.30	0.826	1.00	1.00	0.826
0.40	0.726	1.00	1.00	0.726
0.50	0.639	1.00	1.00	0.639
0.60	0.562	1.00	1.00	0.562
0.70	0.485	1.00	1.02	0.493
0.85	0.399	1.00	1.07	0.428
1.00	0.328	1.00	1.17	0.384
1.20	0.277	1.00	1.13	0.312
1.50	0.200	1.00	1.13	0.225
2.00	0.136	1.00	1.13	0.153
3.00	0.080	1.00	1.13	0.090
4.00	0.053	1.00	1.13	0.060
5.00	0.039	1.00	1.13	0.044

7.3 Earthquake Magnitude and PGA for Liquefaction and Seismic Induced Settlement Evaluation

The PGA for ODE and MDE were computed using the USGS "Conterminous U.S. 2014 (v4.1.1)" Unified Hazard Tool (website: https://earthquake.usgs.gov/hazards/interactive/). The PGA was estimated using the average of the ground motions obtained from the Next Generation Attenuation relationships programmed in the Unified Hazard Tool. The controlling earthquake magnitude for PGA for the three events was obtained from hazard deaggregation tool from the same USGS website stated above. The results earthquake magnitude and PGA computed in the manner stated above are presented in Table 7.

Table 7. PGA and Magnitude for Liquefaction Evaluation

Design Earthquake	Magnitude (Mw)	PGA
ODE (150 year event)	6.55	0.359g
MDE (2475 year event)	6.85	0.957g
Caltrans (975 year event)	6.75	0.663g

8 Foundation Recommendations

8.1 Deep Foundations

Based on current design plans, the Sepulveda Boulevard busway/station bridge will be a four-span cast-in-place prestressed concrete box girder bridge structure with two abutments and three bents. The superstructure is approximately 420 feet long and the deck is approximately 70 feet wide. The deck structure accommodates a westbound and an eastbound travel lane, about 42 feet wide total, and side-running platforms about 12-feet wide each. The bridge abutments consist of concrete cantilever walls retaining the west and east approach embankments. Each bridge bent consists of two concrete guideway columns on individual foundations. The existing Sepulveda Boulevard road grades are relatively level at about El. 707 feet and the new top of bridge deck is proposed at about El. 736 feet. Ancillary structures attached to the superstructure include elevators, escalators, and canopies.

8.1.1 Foundation Type

Due to the presence of compressible soils and large structural demands, deep foundations are recommended to support of the new bridge. Based on the geotechnical data collected to date, driven piles or drilled Cast-In-Drilled Hole (CIDH) pile types are feasible as discussed in the Preliminary Foundation Report (Wood/EMI, 2018). Drilled piles are the preferred pile type due to large load demands, limited space for a multiple driven pile group, presence of many buried utilities in the Sepulveda Boulevard area, and noise and ground vibration associated with pile driving. Driven piles are geotechnically also feasible if these issues are properly addressed and/or do not control. Larger diameter drilled shafts will likely be used at the bents of either bridge in consideration of space constraints above and below ground surface and to minimize excavation. Smaller-size drilled piles are likely to be used at the abutments to optimize construction and economize on cost. Drilled piles may involve temporary or permanent steel casing.

Design of CIDH piles should follow AASHTO-CA BDS LRFD (2012 LRFD Bridge Design Specifications with California Amendments, 2014), Caltrans Seismic Design Criteria, Version 2.0 (April 2019), and Caltrans Memo To Designers 3-1 (2014) and Metro Baseline Specifications.

8.1.2 Foundation Data

The design of bridge foundations is based on Load and Resistant Factor Design (LRFD) following in AASHTO-CA BDS LRFD. LRFD Service-I Limit State, Strength Limit State, and Construction Limit State load combinations are used for design of abutment foundations. The LRFD Service-I Limit State, Strength Limit State, and Extreme Event Limit State load combinations are used for the design of the bent foundations.

Foundation design data and demands were provided by Mott MacDonald. The design data and loads is shown in Table 8 and Table 9 following Caltrans Memo To Designer 3-1 (2014) format.

Table 8. Bridge Foundation Design Data

Support Design			Finished Grade	Cut-Off El.	Pile Cap Size (ft)		Permissible Settlement	No. of Piles
Саррон	Method File Type Grade (ft) B	L	under Service Load (inch)	per Support				
Sepulveda Blvd GS – Busway Bridge								
Abut 1	LRFD	60" Dia. CIDH	707.0	700.0	7	53	1	4
Bent 2	LRFD	120" Dia. CIDH	707.0	700.0	N/A	N/A	1	2
Bent 3	LRFD	120" Dia. CIDH	707.0	700.0	N/A	N/A	1	2
Bent 4	LRFD	120" Dia. CIDH	707.0	700.0	N/A	N/A	1	2
Abut 5	LRFD	60" Dia. CIDH	707.0	700.0	7	53	1	4

Note: N/A = Not Applicable

Table 9. Bridge Foundation Design Loads

	Serv	ice-I Lim (kips)			Strength/Construction Limit State (kips)			Extreme Event Limit State		(kips)	
Support	Total L	oad	Permanent Loads	Compre	ession	Tensi	on	Compre	ession	Tens	ion
	Per Support	Max. Per Pile	Per Support	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile
Sepulveda Blvd GS – Busway Bridge											
Abut 1	N/A	500	N/A	N/A	600	N/A	N/A	N/A	500	N/A	0
Bent 2	N/A	2,550	N/A	N/A	3,300	N/A	N/A	N/A	3,450	N/A	0
Bent 3	N/A	3,000	N/A	N/A	3,900	N/A	N/A	N/A	4,050	N/A	0
Bent 4	N/A	3,350	N/A	N/A	4,350	N/A	N/A	N/A	4,500	N/A	0
Abut 5	N/A	650	N/A	N/A	850	N/A	N/A	N/A	650	N/A	0

Note: N/A = Not Applicable (load per pile provided in the table)

8.1.3 Soil Parameters for Pile Design

Based on the boring and laboratory test results, an idealized soil profile was developed for axial and lateral pile capacity evaluation as presented in Table 10.

Table 10. Idealized Soil Parameters for Pile Design

Depth below OG (ft)	Predominant Soil Type (USCS)	SPT- Equivalent Blowcounts per foot (design value)	Total Unit Weight (pcf)	Friction Angle (design value)	Cohesion/ Shear Strength (psf)	Subgrade Modulus k (pci)
	Sepulveda Sta	ation (based on l	LPE-10, CP1	Γ-2, and B-48)	
OG-36	Stiff Clay (CL)	12-30 (16)	120	0°	1,900	NA
36-68	Medium Dense Sands (SC, SM, SP) with Layer of Stiff Clay (CL)	40-90 (40)	130	38°	0	180
68-74	Very Dense Clayey Sand (SC)	40-100 (50)	68*	38°	0	120
74-96	Dense to Very Dense Sands (SM, SP)	40-90 (50)	73*	38-42° (38°)	0	100

Notes:

OG is near Elevation 707 feet for Sepulveda Blvd Crossing

USCS=Unified Soil Classification System

For clay layers, use the "Stiff Clay without water table" model in LPILE and a ϵ_{50} parameter of 0.005 or as provided in LPILE (Ensoft, 2019). For sand layers, use "Sand (Reese)" model in LPILE.

8.1.4 Axial Capacity

The bridge abutment foundations at are expected to be earth retaining walls on concrete pile caps embedded below finished grade. The pile caps are supported by groups of piles which should be spaced at least 2.5D apart on-center where D is the diameter of the pile (AASHTO-CA BDS Section 10.8.4.6). Each bent column is proposed to be supported by a large-diameter Type I or II drilled shaft.

Abutment piles are proposed to be constructed prior to construction of the adjacent raised MSE walls. Subsequent placement of the embankment fills will induce ground settlements below the bottom of fills (see Section 8.4). Per the designer, surcharging is not feasible at project site to remove some or all of the ground settlement prior to pile construction. The ground settlements due to fill placement occurring around the piles will cause additional pile downdrag forces acting on the pile foundations after construction. Pile downdrag effects in the upper 36 feet from this impact and soil liquefaction-induced ground settlements (see Section 5.5) were incorporated at the abutments. A settlement criterion of approximately ½ inch was used in determining the depth of downdrag for preliminary design of pile foundations.

^{*}buoyant unit weight for soils below groundwater level

Axial pile capacity analyses were conducted using Section 10.8 of AASHTO-CA BDS LRFD and Reese and O'Neill (FHWA, 2010) methods. Pile downdrag effects were incorporated for pile design at the abutments.

The bent piles are expected to tip in bearing strata consisting of very dense sands with interbeds of hard clays. Due to the large demands at the bents and to reduce pile length and cost of large-diameter piles, base resistance was included for the bent pile foundations. Ultimate base resistance was defined at a pile tip settlement equal to 5% of the pile diameter (Section 10.8.3.5 AASHTO-CA BDS LRFD) and adjusted for pile diameter and limiting pile-head displacement of 1 inch as required in Table 8. Recommendations for construction are provided in Section 8.1.7. A resistance factor of 0.7 was used for the Strength Limit state, and 1.0 for the Extreme Event state, for both skin friction and end-bearing.

Nominal resistances for the LRFD limit states were obtained by dividing the factored loads in Table 9 by the aforementioned resistance factors and an axial group efficiency factor of 1.0 for both cases. The controlling (largest) nominal resistance at each support is presented in Table 11 along with corresponding pile design tip elevations and specified tip elevations. Table 11 is a pile data table for use on the contract plans.

The pile capacities for Strength Limit and Extreme Event demands are based on soil resistance only and may be further limited by the pile-head connection details and structural material strength.

Table 11. Bridge Pile Data Table

Location	Pile Type	Nominal Res)	Design Tip El. (ft)	Spec. Tip El. (ft)
		Compression	Tension		
		Sepulveda E	Blvd GS – Bu	sway Bridge	
Abutment 1	60" Dia. CIDH	860	0	(a) 627, (c) 672, (d) 647	627
Bent 2	120" Dia. CIDH	4,720	0	(a) 623, (d) 612	612
Bent 3	120" Dia. CIDH	5,580	0	(a) 637, (d) 612	612
Bent 4	120" Dia. CIDH	5,580	0	(a) 637, (d) 612	612
Abutment 5	60" Dia. CIDH	1,020	0	(a) 621, (c) 666, (d) 647	621

Notes:

- 1. Design Tip Elevations are controlled by the following demands: (a) Compression, (b) Tension, (c) Settlement, and (d) Lateral Load.
- 2. Specified Tip Elevations shall not be raised above the Design Tip Elevations for Settlement and Lateral Load.
- 3. Nominal Resistance in tension not provided, as the tension load is zero (see Table 9) and does not govern pile length.

8.1.5 Pile Settlement

Per Table 8, the permissible settlement at the pile cut-off elevations under the Service Limit state is 1 inch. Based on preliminary service loads provided by the designer and shown in Table 9, pile settlements under the Service Limit State loads are estimated to be less than 1 inch based on skin friction resistance. The actual settlement for the Strength and Extreme Event

states are also estimated to be 1 inch or less based on design skin friction and limited endbearing if any (Section 8.1.3). The design tip elevations for settlement are shown in Table 11.

8.1.6 Lateral Pile Capacity

Lateral pile capacity evaluation depends on a number of parameters, including the ground condition, pile cut-off elevation, pile fixity at the bent cap (pinned or fixed), elevation (below ground, above ground), magnitude (lateral load or displacement), direction of loading, structural section properties, and allowable pile deflection. The pile cut-off elevations shown in Table 8 will be below finished grades. For service load design, the lateral allowable pile deflection is usually small and linear-elastic soil behavior can be assumed. For ultimate load design (typically under seismic conditions), piles are usually designed for larger deflections and non-linear behavior of the surrounding soil should be considered.

Lateral pile design can be performed using LPILE (Ensoft, 2019) or other software to model any of these cases using the soil parameters provided in Table 10. For lateral pile interaction, Table 12 provides group reduction factors (pile group efficiency) to be applied as "p-multipliers" full-length on each pile in the group. Factors may be interpolated for intermediate pile spacings.

Figures 11 and 12 show pile solutions for the Sepulveda Station structure Abutments and Bents, respectively. The above solutions are provided for requested load cases and were based on an elastic pile section of concrete with a compressive strength of 4,000 psi, uniform diameter, no steel casing, and a free-head condition. The solutions incorporate average group efficiencies based on the pile layouts shown on the design plans and can be used for pile loadings in the bridge longitudinal or transverse directions. Separate solutions for each loading direction and other pile group configurations can be obtained by running individual LPILE solutions applying p-multipliers in Table 12. The pile design tip elevations resulting from the above analyses were included in Table 11.

For single-column bents, a 20% increase in pile length should be applied to the critical pile length calculated due to lateral loads following Caltrans Bridge Design Practice Manual (2015). The soil parameters and soil support (p-y) curves to be used can be developed using the parameters shown in Table 10.

Table 12. Lateral Group Effects

Pile Spacing On-Center	P-Multiplier Row 1	P-Multiplier Row 2	P-Multiplier Row 3+
	Pile Group Wi		
Los	ading in Bridge Longitudir	nal or Transverse Direction	on
2D	0.60	0.35	0.25
3D	0.75	0.55	0.40
5D	1.00	0.85	0.70
7D	1.00	1.00	0.90
8D	1.00	1.00	1.00
	Pile Group With	h Single Row	
	Loading in Bridge Lo	ngitudinal Direction	
2.5D	0.80		
3D	0.90		
4D	1.00		

Note: D= Pile Diameter

8.1.7 Construction Considerations

The CIDH piles should be constructed in accordance with Section 49-3 of the Caltrans Standard Specifications (Caltrans, 2015) and Metro Baseline Specifications. To improve CIDH pile construction, a concrete cover over steel reinforcement should be provided in accordance with Table 10.8.1.3-1 of AASHTO-CA LRFD BDS. Feasible pile construction methods available to the designer builder include "dry construction", "wet construction", and the use of casing.

"Dry construction" is feasible if groundwater is not encountered or the open hole can be safely dewatered.

Based on existing geotechnical data (Section 4.3), groundwater is expected to be encountered during pile drilling. Where groundwater is encountered within the pile length, "wet" construction such as using the slurry displacement method and/or casing would be necessary. Caltrans standard practice for "wet" construction requires CIDH piles with diameter of 24 inches or larger to incorporate PVC tubes attached to the steel reinforcement to conduct gamma-gamma testing in accordance with Caltrans Memo to Designers 3-1 (2014).

The utility plans suggest the Sepulveda Boulevard bridge supports at Abutment 1 to Bent 4 potentially conflict with a 36-inch diameter existing storm drain. Buried utilities adjacent to proposed pile foundations should be either protected in-place or permanent pile isolation casing such as steel or sonotube could be used in the upper portion of the piles down to the bottom elevation of the utility. If casing is used, it should either be placed tight in the drilled hole, or placed in an oversized hole and the annulus between casing and soil should be tremie-grouted.

The preferred casing installation is by working in (pushing and twisting with the Kelly bar or other acceptable means and method) tight into the ground. Driving casing is only feasible if noise and ground vibration are properly addressed and/or do not control. For permanent casing, Corrugated Metal Pipe is recommended to be placed in an oversized drilled hole not more than 2 feet larger than the side of the drilled pile and should be embedded a minimum of 5 feet below the construction joint. The annulus should be grouted per Section 49-3.02B(5) and C(6) of the Caltrans Standard Specifications (2015) in order to include geotechnical skin friction for pile capacity within the casing length. CMP should not be included in the structural capacity calculation. Alternatively, smooth steel casing or sonotube is feasible if adjacent buried utilities are protected in place or relocated.

The shallow soils at the proposed bridge sites predominantly consist of cohesive soils. The soil borings also indicate that presence of variable amounts of fines, silts and gravel. Layers of cohesionless materials could have caving potential in a drilled open hole. The contractor should be prepared to have appropriate means and method available to control soils susceptible to caving which can include temporary steel casing or drilling fluid. If temporary casing is used, it should have an outer diameter equal to or exceeding the pile diameter. Vibratory equipment is not recommended to avoid adverse effects on skin friction and leaving the available bond strength uncertain. Temporary casing should be pulled as the concrete is being poured while always maintaining at least a 5-feet head of concrete inside the casing. Other means and method to control caving include placement of soil cement slurry within the caved zone with a strength that is similar to that of the surrounding soils, then drilling through the slurry after it has reached initial set.

Loose soils should be properly cleaned from the bottom of the CIDH excavations. The borings should be inspected with contractor assistance (such as through the use of the miniSID device or other available contractor means and method for verifying the condition at the bottom of CIDH excavations) and approved by a geotechnically qualified person prior to the installation of reinforcement. Extreme care in drilling, placement of steel, and the pouring of concrete will be essential to avoid excessive disturbance of pile excavation walls. The pile reinforcing cage should be installed and the concrete pumped expeditiously after drilling is completed. No pile excavation should be drilled adjacent to another pile in the same pile group until the concrete in the other pile has attained its initial set.

8.2 Bridge Abutments

At the Sepulveda station bridge site, the abutments consist of earth retaining walls on pilecaps. Current design plans do not indicate the abutment wall configuration. Seat-type bridge abutments include a backwall that retains approach fills.

8.2.1 Wall Design

<u>Lateral Earth Pressures</u>. For design of abutment walls that retain level and compacted backfill, and that are free to move laterally at the top, a static active lateral earth pressure of 36 psf per foot of depth is recommended (K_a =0.3). If wall displacement is restrained, an at-rest pressure of 55 psf per foot of depth can be used (K_o =0.45). A uniform lateral pressure due to vehicular loads equivalent to a vertical pressure produced by at least 2 feet of earth, should be added to the above lateral earth pressure.

For earthquake loading, an incremental seismic active earth pressure of 15 psf per foot of depth can be used. This value was determined based on the Mononobe-Okabe/Trial Wedge method with a seismic coefficient equal to one-half the PGA from Section 7.1 for the Caltrans seismic design spectrum.

<u>Passive Earth Pressure</u>. Under seismic loading, an ultimate passive earth pressure of 5.0 ksf may be used for the approach backfill and abutment backwall with a design height of 5.5 feet or greater per Section 6.3.1 of Caltrans SDC 2.0 (2019). The horizontal movement at which the maximum passive pressure is expected to be fully mobilized can be determined following the procedure outlined in Section 7.8.1 of the Caltrans SDC (2013) and Section 6.3.1 of Caltrans SDC 2.0 (2019).

8.2.2 Construction Considerations

The abutment walls retain structural backfill and also reinforced backfill placed for the adjacent MSE walls. Recommendations for structural backfill are provided below. Recommendations for the MSE wall backfill are provided in Section 8.4.

<u>Backfill Requirements</u>. Structure backfill material placed behind the concrete bridge abutment walls should be in accordance with Section 19-3 of the Caltrans Standard Specifications (2015) and Caltrans Standard Plans (2015) and Metro Baseline Specifications.

The on-site soils can only be re-used as compacted fill if they meet the standard requirements for Structure Backfill and are not corrosive. Any fine-grained native soils encountered during grading should not be placed behind abutment walls.

Backfill should be compacted in accordance with Section 19-5 of the Caltrans Standard Specifications. Backfill should be placed in loose lifts not exceeding 8 inches in thickness, moisture-conditioned to near optimum moisture content, and compacted to at least 95% relative compaction. The relative compaction should be based on the maximum density determined by California Test 216. Jetting or flooding to compact backfill is not permitted. Heavy compaction equipment, such as vibratory rollers, dozers, or loaders, should not be used adjacent to the abutment walls in order to avoid damaging the walls due to large lateral earth pressures.

Backdrain Requirements. Backdrains should be installed behind the walls to relieve hydrostatic pressure. Backdrains can be constructed as applicable in accordance with weepholes and wall drains with filter/drainage materials can be constructed in accordance with Sheet B0-3 per Caltrans Standard Plans (2015) or the geocomposite drain alternative per Section 6 of the Caltrans Bridge Design Aids (1992), perforated plastic pipe surrounded by gravel and wrapped in filter fabric placed near the bottom of the wall with adequate outlets, or prefabricated drain composites may be substituted.

8.3 Shallow Foundations

8.3.1 Foundation Type

Design of structural attachments to the Sepulveda Blvd Station such as escalators, elevators, emergency egress staircases, and equipment and maintenance rooms etc., should follow Metro standards, California Building Code (CBC, 2016) and City of Los Angeles Building Code (2017).

These structures may be supported on conventional shallow foundations consisting of spread footings or mat foundations depending on the foundation sizes and loads. The foundations may be supported by existing natural clay soils or compacted import structural fill material. Any existing uncertified fill should either be removed and recompacted or replaced with properly compacted fill.

8.3.2 Bearing Capacity

Footings with a minimum embedment of 2 feet and a minimum width of 1.5 feet may be designed using an allowable bearing pressure of 2,500 psf. For footings with a minimum

embedment of 4 feet, an allowable bearing pressure of 4,000 psf can be used. The allowable bearing pressure may be increased by one-third for temporary loads associated with wind or seismic loading.

8.3.3 Lateral Resistance

Lateral loading on the foundation can be resisted by a combination of friction between the bottom of footing or slab and the foundation soil, and passive soil resistance mobilized against the vertical face of the footing. For preliminary design of footings placed on native medium stiff clays and silts or compacted fill, an allowable passive earth pressure of 300 pounds per cubic foot (pcf) and an allowable coefficient of friction of 0.3 can be used. Both design parameters include a factor of safety of 1.5 and can be combined without reduction.

8.3.4 Settlement

Structural loads were not available at the time of this report. Conventional shallow foundations due to the allowable bearing pressure of 4,000 psf are expected to settle less than 1.5 inches. Differential settlements are estimated to be less than 1 inch over a horizontal distance of 40 feet between adjacent footings. Large structural mat foundations imposing an allowable bearing pressure up to 4,000 psf are expected to settle less than 3 inches. In addition, liquefaction settlement as discussed in Section 5.5 should be considered when selecting foundation type. Foundations will be evaluated during final design when dimensions, depths and loads become available. Although not anticipated, if static and seismic settlements based on final design loads are too large for shallow foundations, deep foundations can be considered for support of the minor structures.

8.3.5 Modulus of Subgrade Reaction

For preliminary design, mat foundations can be designed for a unit subgrade modulus of 100 pounds per cubic inch (pci) or a size-adjusted subgrade modulus of 25 pci. The final modulus will be determined interactively with structural design depending on the actual size and structural loads.

8.3.6 Construction Considerations

Based on limited testing, the expansion index of the shallow clay and silt soils was found to be low. If supplemental geotechnical field investigation confirms this finding, then new footings and slabs-on-grade design will not require special structural design for expansive soils.

8.3.6.1 General.

Site preparation and earthwork for shallow foundations construction and backfill, utility installation, and general site grading should be performed in accordance with requirements of the Metro Baseline Specifications, Standard Specifications for Public Works Construction (Greenbook, 2010 or later), and City of Los Angeles building code, and as well as applicable codes, health and safety regulations and other local, State or federal specifications, and the recommendations in this report. Excavations and cuts should be inspected during grading. Any uncertified fill soils should be excavated and recompacted or replaced with properly compacted fill. Areas to receive fill should be cleared of all vegetation, debris, loose or soft soils, and any other deleterious material to expose a firm and unyielding ground surface.

On-site materials can be excavated using conventional heavy-duty earth-moving equipment. Excavations and any compacted fill placed for the project should be observed, monitored, and tested by qualified geotechnical personnel during grading. Field and laboratory tests should be

conducted in accordance with ASTM methods as specified in the Greenbook and any other applicable testing requirements such California Test methods.

For unsupported cuts in existing soils, the recommended maximum gradient should not exceed 1H:1V. Appropriate measures should be taken to prevent damage to adjacent existing structures and utilities. Temporary excavations must be properly cut, sloped or shored in accordance with all applicable codes and regulations including OSHA standards. Design of a shoring system can be conducted with input from a geotechnical engineer. No excavation should be performed below an imaginary plane inclined at 1:1 from the edge of any existing foundation and other structures including roadways without providing adequate support for the existing foundation. If a trench shoring design and safety plan is required, the geotechnical consultant should review the plan to confirm that recommendations presented in this report have been applied to the design.

In addition, soil stockpiles or other storage loads and vehicular and construction equipment should be set back a minimum distance of 5 feet from the edge of the slope.

8.3.6.2 Subgrade Preparation

Complete removal of compressible surficial materials including vegetation, topsoil, loose or soft alluvium, dry or saturated soil, wet, unstable, or otherwise unsuitable material such as uncertified fill is required prior to fill placement. Areas to receive fill for grading should be scarified to a depth of at least 6 inches, moisture-conditioned as necessary to near-optimum moisture content, and proof-rolled to a firm and unyielding subgrade. Probing should be performed by a geotechnical field personnel to identify the presence of any loose or soft zones after proof-rolling.

8.3.6.3 Fill Placement

Existing fills that are undocumented, uncertified or found to be unsuitable should be removed.

Areas to receive fill should be cleared of all existing vegetation, debris, loose or soft soils, dry or wet materials, and uncertified fill or any other deleterious material to expose a firm and unyielding ground surface. Fills placed against existing, undisturbed soil should be properly keyed and benched per Greenbook or otherwise per Section 19-6.01 of the Caltrans Standard Specifications, as applicable. A minimum overexcavation of 2 feet is recommended within all areas to receive compacted fill supporting structures unless stated otherwise. The overexcavation is recommended to extend horizontally a minimum distance of 2 feet from edges of new fills or structures. A minimum overexcavation of 1 foot is recommended within all other areas to receive compacted fill unless noted otherwise. The overexcavation should extend horizontally a minimum distance of 1 foot from edges of new fills. Actual depths and extent of the required removals should be determined in the field by qualified geotechnical personnel based on local conditions. Excavation bottoms should be firm and unyielding prior to fill placement.

Prior to placing compacted fill, the exposed subgrade is recommended to be scarified to a minimum depth of 6 inches, moisture-conditioned as necessary to near-optimum moisture content, and compacted to at least 90% relative compaction based on maximum densities determined in accordance with ASTM D1557 or Caltrans CT-216 methods or equivalent, as applicable. Fill should be placed in uniform horizontal loose lifts not exceeding 8 inches in thickness, moisture-conditioned to near-optimum moisture content, and compacted to at least 90% relative compaction. If hand-directed mechanical tampers are used for compaction, the loose lift thickness should not exceed 6 inches. Observation, probing, and testing must be performed by qualified geotechnical personnel to verify the degree of compaction.

Areas that are excavated below finish grade or that are disturbed by construction activities should be overexcavated to a depth where undisturbed material is exposed. Finish grades should be reestablished using fill properly compacted to a minimum of 90% relative compaction.

Unless stated otherwise, all fill is recommended to be compacted to a minimum relative compaction of 90% based on maximum dry density determined in accordance with ASTM D-1557 or Caltrans CTM-216 or equivalent. If a structure to be supported is sensitive to settlement, the minimum compaction requirement could be increased to 95% of the maximum dry density.

<u>Footings</u>. The excavation bottom should be cleaned of loose soil and debris. The excavation bottom should be inspected by qualified geotechnical personnel to confirm the presence of a competent and unyielding subgrade prior to placement of concrete. If the bottoms of the excavations expose loose or soft fine-grained soil, the soil should be removed at least 1 foot below the bottom of the excavation to expose undisturbed material. The horizontal limits of overexcavation from each edge of the footing should be at least 1 foot. The overexcavation should be backfilled with compacted select granular material.

Where conventional backfill and compaction operations not practical or feasible due to limited space, sand-cement slurry or pea gravel, or other selected backfill may be used. Sand-cement slurry should consist of at least 1½ sack of cement per cubic yard. Pea gravel or other materials should be placed and compacted using vibratory or mechanical equipment under the supervision of a geotechnically qualified person.

A vapor retarder is recommended to reduce the potential for moisture transmission through slabs. The installation of the barrier should comply with ASTM E 1643-09, Section 7.2 of the American Concrete Institute 302.2R, and local city requirements. For example, the City of Los Angeles recommends that concrete floors be placed on 4 inches of coarse aggregate or a 2 inch bed of sand over a vapor barrier. A 2-inch bed of sand should be placed between the gravel and the vapor retarder to decrease the possibility of damage to the membrane. If needed, a 2-inch-thick layer of sand can be placed over the vapor retarding membrane and below the concrete slab to reduce slab curling. In accordance with ACI 302.2R-06, the material should comply with ASTM E 1745 requirements and have a permeance of less than 0.01 perms per ASTM E96.

Hardscape and flatwork should be supported on properly compacted subgrade.

8.3.6.4 Fill Materials

For backfill of footings or walls, imported granular soils can be used with a low expansion potential and a plasticity index less than 15%. On-site soil should only be re-used for fill provided all applicable requirements for fill in the Greenbook, or Caltrans Standard Specifications as appropriate, are met. Fill material should not contain organic material, rocks greater than 4 inches in greatest dimension, debris and other deleterious materials. All soils should be tested and approved by a geotechnically qualified person. Import soils are recommended to be tested and approved prior to delivery to the project site.

The on-site soils can potentially be re-used as compacted structure backfill if they meet the standard requirements for Structure Backfill and are not corrosive or expansive. Fine-grained native soils encountered during grading should not be placed behind abutment walls. The sandy soils encountered in boreholes are not expansive.

Any compacted fill placed for the project should be observed, monitored, and tested by qualified geotechnical personnel during grading. Field and laboratory tests should be conducted in accordance with ASTM or California Test methods and any other applicable testing requirements.

8.3.6.5 Observation and Testing

Qualified geotechnical personnel will observe subgrade preparation. Sufficient in-place field density tests should be performed during fill placement and in-place compaction to evaluate the overall compaction of the soils. Soils that do not meet minimum compaction requirements should be reworked and tested prior to placement of any additional fill.

Review and Inspection. Recommendations contained in this report are based on current design information. The geotechnical consultant should review the final construction plans and specifications in order to confirm that the general intent of the recommendations contained in this report have been incorporated into the final construction documents. Recommendations contained in this memorandum may require modification or additional recommendations may be necessary based on the final design, construction of structure foundations, and final slope restoration/grading.

Inspections are recommended to be performed by qualified geotechnical personnel during the following stages of construction:

- Grading operations, including excavations and placement of compacted fill,
- Temporary backcuts and shoring installation,
- Foundation excavations,
- Pile drilling prior to placement of steel reinforcement,
- Footing excavations,
- Exposure, removal or installation of support of buried utilities or structures,
- Placement and compaction of utility trench bedding and backfill,
- Preparation of pavement subgrade and placement of aggregate bases,
- Backdrain construction, and
- When any unusual subsurface conditions are encountered.

8.4 Mechanically Stabilized Earth (MSE) Walls

The MSE walls for the project are anticipated to be up to about 30 feet high with width varying from about 40 feet at its termini to about 66 feet at the bridge.

8.4.1 General

MSE walls are engineered earth retaining structures that consist of compacted fill layered with soil reinforcement to create a stable earthen embankment. A precast concrete panel facing is used to prevent the soil from raveling out between the layers of reinforcement. The backfill usually consists of import engineered granular backfill that is compacted to the specified compaction level. The soil reinforcement could consist of either metal strips/mesh or geogrid that extends from the wall facing to a certain distance to provide internal stability (typically 70% of the wall height). The concrete panel facing is supported on a small leveling pad ("footing") that has a minimum embedment to achieve the necessary bearing capacity and to aid in panel erection.

Both the internal and external stability of the wall system should be evaluated. The internal stability of the MSE wall system is the responsibility of the MSE wall designer as it requires that the design (tension and pullout resistance of reinforcement elements) be completed and dimensions and short-term/long-term properties of the materials used for reinforcement and backfill be established. The external stability evaluation involves analyses for overturning, sliding, bearing capacity and global stability which are discussed later in this section.

The weight of the MSE wall will induce additional load on the subsurface soil and result in settlement. The settlement will be non-uniform as the additional stresses induced are a function of the embankment fill height. The estimated settlement of the embankment will induce downdrag forces on the pile foundations planned at the abutments (as discussed in Section 8.1.4). As the settlement in fine grained soils will be relatively slow, the MSE wall will experience some settlement even after construction due to ongoing compression of subsurface soils. The site can be pre-loaded to the extent possible, to accelerate the settlement, however, MSE wall will experience some settlement over time. The need for preloading and the settlement the MSE wall will experience should be evaluated during the final design.

Furthermore, the estimated settlement beneath the embankment should be evaluated with respect to the impact on any existing and proposed underground utilities as well as existing structures, such as the existing industrial and commercial buildings immediately adjacent to the embankment. If the estimated settlement is determined to be excessive, light weight material such as EPS Geofoam (Geofoam, or equivalent), may be used as backfill for the embankment. A settlement monitoring program should be implemented (1) to establish a baseline reading and the condition of existing structures and (2) to monitor the effects of the embankment construction on existing adjacent structures and underground utilities.

The borings and laboratory testing of samples indicate that the existing granular fill soils within 5 feet of the ground surface may have potential for hydrocollapse upon saturation. Additional investigations in the future phases of the project will be useful in confirming if the hydrocollapse potential is localized and the required depth of soil improvement, if needed.

8.4.2 Properties of Reinforced Earth

For preliminary design purposes, the following parameters may be used for the granular backfill:

- Cohesion (c) = 100 pounds per square foot
- Angle of Internal Friction (φ) = 34 degrees
- Unit Weight = 120 pounds per cubic foot
- Static Active Earth Pressure Coefficient (K_a) = 0.28
- Static Active Earth Pressure = 34 pounds per cubic foot
- PGA = 0.663g (for Caltrans 975-year event)
- Horizontal Seismic Coefficient (K_h) = 1/3 * PGA = 0.221
- Seismic Earth Pressure Coefficient (K_e) = 0.12
- Seismic Earth Pressure = 15 pounds per cubic foot

The above design soil parameters should be considered as the minimum requirement in selection of the import backfill material to construct the embankments. The import material should be a fee-draining (coarse-grained) material. The strength parameters for the MSE wall backfill were assumed per Section 11.10.6.2 of the AASHTO-CA LRFD BDS and Caltrans Bridge Standard Detail Sheets (XS-sheets) for MSE walls. The horizontal coefficient for seismic earth pressure computation was taken as the greater of $K_h = 0.2$ and one-third of the PGA recommended per Caltrans practice for MSE walls. The earth pressure was computed using Mononobe-Okabe method as recommended in Section A11.3.1 of AASHTO-CA LRDF BDS.

The following design information as shown in Tables 13 and 14 per Caltrans cannot be developed at this time; such information can be developed in the future phases of the project, particularly in the 100% design phase.

Table 13. Design Tables for MSE Wall Design

MSE Station (ft)	Design Height (H) (ft)	Bottom of Leveling Pad Elevation (ft)	Base Width (B) (ft)	Minimum Embedment Depth (ft)

Table 14. Foundation Data for MSE Wall Design

MSE	Ser	vice Limit	State	Stre	ength Limi	t State	Extreme Limit State				
Station (ft)	Effective Base Width (ft)	Base Bearing Set Width Stress at		Effective Base Width (ft)	Vertical Bearing Stress (psf)	Factored Bearing Resistance (psf)	Effective Base Width (ft)	Vertical Bearing Stress (psf)	Bearing Bearing Stress Resistance		

8.4.3 Bearing Capacity

The reinforced soil mass along its basewidth typically has a minimum embedment depth (about 1 foot) to the top of the leveling pad that supports the wall facing. The natural soils at the foundation level are generally stiff and have sufficient bearing capacity to support the additional earth loads from construction of the MSE wall.

The wall facing will be supported on a small continuous footing/leveling pad (about 1 to 2 feet wide and an embedment depth of 1 to 2 feet below adjacent grade or greater if larger bearing capacity is needed). Footings with a minimum embedment of 2 feet and a minimum width of 1.5 feet may be designed using an allowable bearing pressure of 2,500 psf. The allowable bearing pressure may be increased by one-third for temporary loads associated with wind or seismic loading. If unsuitable soils (existing fill) are encountered, the soils shall be overexcavated and recompacted or replaced with properly compacted fill. The compacted fill layer should extend beyond the footing to a distance equal to the depth of the compacted fill. Where conventional backfill and compaction operations not practical or feasible due to limited space, sand-cement slurry or pea gravel, or other selected backfill may be used. Sand-cement slurry should consist of at least 1½ sack of cement per cubic yard. Pea gravel or other materials should be placed and compacted using vibratory or mechanical equipment under the supervision of a geotechnically qualified person.

8.4.4 Sliding and Overturning

Lateral loads can be resisted by soil friction at the base of the MSE wall between granular backfill and foundation soils. An ultimate coefficient of friction of 0.35 can be used between the MSE wall backfill and foundation soils. Since the MSE wall is a gravity-type wall, sliding and overturning demand is not anticipated to govern the design. If needed, the MSE wall basewidth and embedment can be increased such that adequate factors of safety are achieved for sliding and overturning.

8.4.5 Settlement

Settlement analysis was performed using Settle3D version 4.0 program by Rocscience (2018) – a 3-dimensional program for the analysis of settlement and consolidation under foundations, embankments and surface excavations. The consolidation test results were reviewed and compression and recompression indices (Cc and Cr) were estimated for the fine-grained

materials; for the granular materials, Young's modulus based on SPT blow counts was computed and used in the analysis.

Based on the preliminary settlement analyses performed, the maximum ground settlement under the embankment is estimated on the order of 5 to 6 inches, the majority (90%) of which is expected to occur within one year of construction. The differential settlement is estimated to be about 1 inch for every 200 lineal feet along/across the embankment, which is within tolerable limits specified in Section 11.10.4 of AASHTO BDS for MSE walls with segmental concrete block facing. If a full height precast concrete facing panel is used (which is not anticipated), then the acceptable total and differential settlement may be more restrictive than for flexible segmental wall. A limiting differential settlement between the front and back of the wall per Section 11.10.4 of the AASHTO LRFD BDS (2012) should also be considered so the deformation/rotation of the wall facing and reinforcement connection to wall facing are not affected.

When additional borings are performed in the future phases of the project, settlement estimates provided herein can be re-evaluated and the effect on the structures supported above the MSE wall as well as those adjacent to the MSE wall and subsurface utilities should be evaluated.

The majority of the settlement under the weight of the MSE wall was computed in the upper 30 to 40-foot thick clay and is expected to happen during construction and within one-year of completion of the MSE walls. The estimated settlement of the embankment will induce downdrag forces on the pile foundations planned at the abutments (as discussed in Section 8.1.4). The site can be pre-loaded to the extent possible, to accelerate the settlement, however, MSE wall will experience some settlement even after construction. The need for preloading and the settlement the MSE wall will experience should be evaluated during the final design.

A settlement monitoring program can be implemented from the beginning of the construction of the MSE wall to document the rate of settlement to evaluate the overall integrity of the MSE wall system upon completion and to make a decision for construction of the concrete cap beams and other structures supported on them. If it is desired to accelerate the settlement process, the site can be pre-loaded

In addition to the static settlement, the MSE wall may be subject to liquefaction and seismically induced settlement as discussed in Section 5.5. Since MSE wall systems can accommodate relatively large total and differential settlement and given the history of satisfactory performance of MSE walls in past earthquakes (see Sections A11.2 of AASHTO LRFD BDS), the MSE wall designer should review the total static-plus-settlement estimates provided herein and if unacceptable, consider ground improvement techniques to improve the soil.

8.4.6 Earth Pressures

For design of MSE wall systems, where the surface of the backfill is level, it can be assumed that drained soils will exert a lateral pressure equal to that developed by a fluid with a density of 34 pounds per cubic foot. The recommended earth pressure is based on the active earth pressure coefficient stated in Section 8.4.1. In addition to the recommended earth pressure, the walls should be designed to resist any applicable surcharges due to storage or traffic loads. The traffic surcharge due to vehicular traffic should be taken as a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal vehicular traffic. A greater lateral pressure shall be used if prescribed by Metro or Caltrans design standards.

In addition to the above-mentioned lateral earth pressures, walls should be designed to support a seismic active pressure. As stated earlier in Section 8.4.1, a seismic active pressure in the

form of a triangular (fluid) distribution with the maximum pressure equal to 15H pounds per square foot, where H is the wall height in feet, is recommended. The earth pressure was computed using the Mononobe-Okabe method following Section A11.3.1 of AASHTO LRDF BDS.

8.4.7 Global Slope Stability

A global slope stability analysis of the MSE wall was performed using GSTABL7 Version 2.005.2A (with STEDwin) – 2D Limit Equilibrium Slope Stability Analysis System software by Gregory Geotechnical (GSTABL, 2012). The stability of the fill slope was analyzed using the Modified Bishop method. The program uses a Critical Failure Surface Searching Method with a random technique for generating circular surfaces. A minimum of 500 trial surfaces were generated to identify the critical failure surface.

The analysis was performed for static and seismic loading conditions considering undrained and drained condition for static condition to represent the short-term and long-term conditions. For seismic loading, only undrained strength was considered for the clays. The MSE wall cross-sections at three stationing's presented on drawing C-301 - "Busway Typical Cross-sections (Sheet 1 of 2)" of the 15% plan set were utilized as they represent the various wall configurations along this segment. The surcharge pressure from the freeway vehicular traffic (equivalent to 240 pounds per square foot or 2 feet of soil weight, per Caltrans Standard Plans) was also considered in the analysis. The soil properties presented in Section 4.1.1 were used for reinforced fill and the properties presented in Table 12 were used for the foundation soils.

For seismic analysis, a horizontal seismic coefficient (k_h) was computed for the three hazards levels – namely MDE and ODE (Metro MRDC) and Caltrans design ground motion (i.e., event with a 975-year return period). The estimated seismic coefficient taken as one-third of the PGA) are presented in the following Table 15:

Design Earthquake	Magnitude (Mw)	PGA	K _h
ODE (150 year event)	6.55	0.359g	0.12
MDE (2475 year event)	6.85	0.957g	0.36
Caltrans (975 year event)	6.75	0.663g	0.22

Table 15. Seismic Coefficient for Slope Stability Evaluation

Based on the slope stability analyses, the factors of safety for static and seismic conditions for the governing condition were greater than 1.5 and 1.1, respectively. The computed factors of safety are acceptable.

8.4.8 Drainage

Proper drainage should be provided to ensure long-term performance of the MSE wall system. The grades near the toe of the MSE wall as well as above at the finished surface should drain water away from the MSE wall system. Although MSE wall is constructed with permeable granular material with joints between segmental concrete panels, it is recommended that a properly sized underdrain wrapped in filter fabric be provided near the base of the base to drain any water seepage/flow from the finished driving surface.

^{*}Factor of safety for static and seismic conditions, respectively

8.4.9 Construction Considerations

The MSE wall backfill should be properly compacted and verified that it meets the design compaction specification (both dry density and moisture content). During construction, the grade at the top of surface and toe of the wall should be positively drained to prevent ponding or erosion of the backfill material. All requirements and specifications in Metro MRDC, Metro Baseline Specifications and Caltrans standards, whichever is applicable should be followed.

9 Additional Investigations

The recommendations provided in this 30% GDM are based on limited geotechnical investigations and should be used only for preliminary design and costing. Additional investigations consisting of borings and CPTs including field and laboratory testing should be performed in future phases of the Project in accordance with requirements of MRDC (Metro, 2017) to confirm the conclusion and recommendations presented herein.

Additional investigations are recommended to consist of the following: for stations, a minimum of one boring and/or CPT at every support, staggered left and right of the bridge structure, and one to two borings at each abutment. If a single large diameter pile is used for column support, it is recommended that one boring be performed at each large-diameter (large demand) column location to obtain more specific subsurface information and to potentially prevent contractor claims (changed ground condition). Such borings should be drilled to a depth of at least 20 feet below the required pile length based on demands. Based on current information, borings to a depth of 120 feet appear to be sufficient. Furthermore, pile load tests should be considered if the drilled shafts are designed to include capacity from friction and from end bearing, particularly if large diameter piles with large demands are planned.

Explorations along MSE walls are recommended to consist of additional borings and/or CPTs to further evaluate static and liquefaction settlement. Such borings may be spaced at 500 to 1,000 feet and should extend to a depth of 75 to 100 feet below existing grade.

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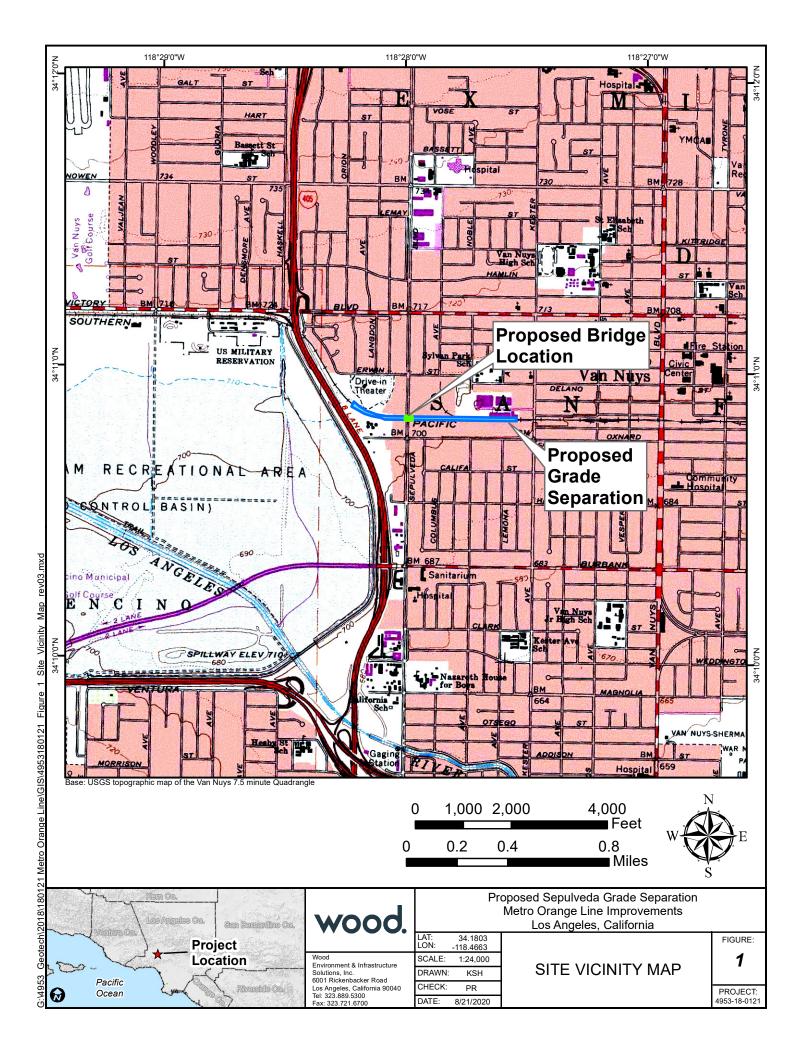
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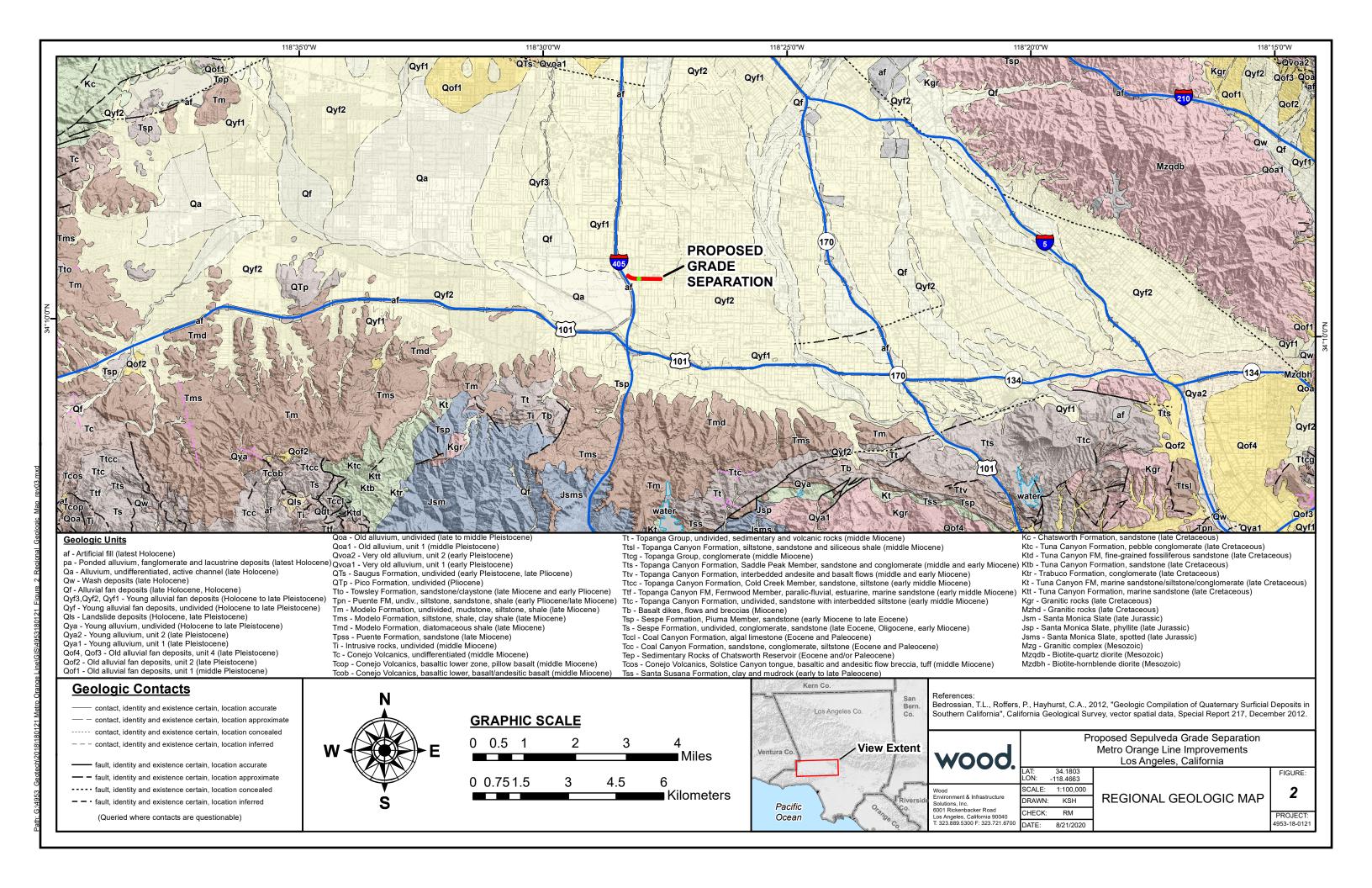
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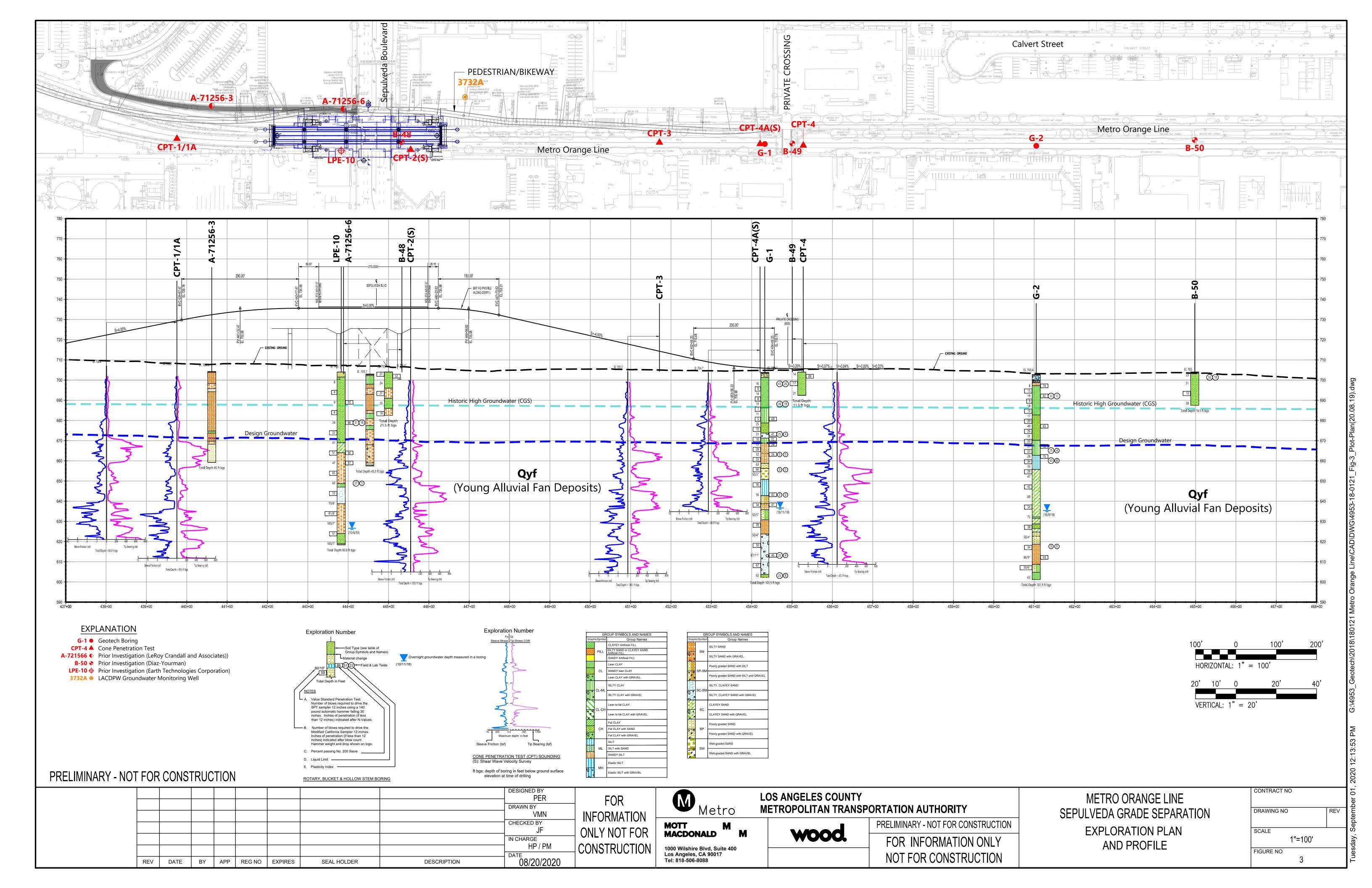
Wood/EMI, 2018, Draft Geotechnical Data Report, Metro Orange Line – Sepulveda Boulevard Segment, report dated November 8, 2018.

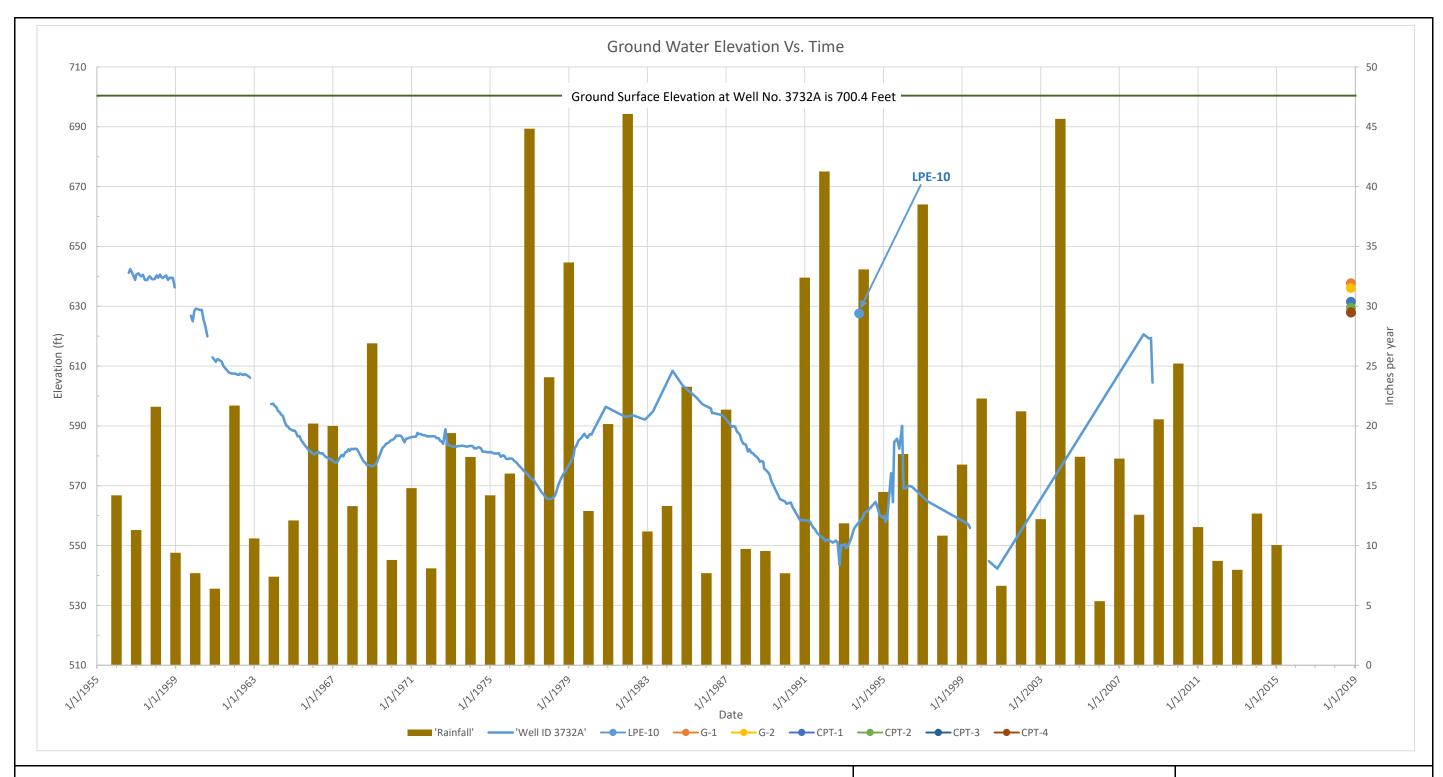
ZIMAS, 2018, City of Los Angeles Department of City Planning Zone Information and Map Access System (ZIMAS), Accessed 10-08-19, from City of Los Angeles web: http://zimas.lacity.org/

Figures









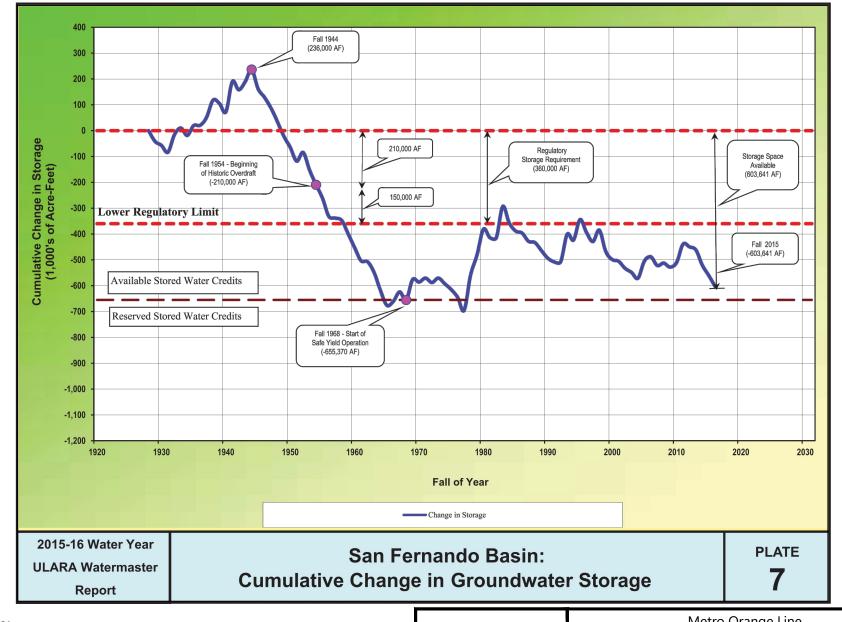
RAINFALL AT BURBANK VALLEY PUMP PLANT RAINGAGE WELL, BORING AND CPT LOCATIONS SHOWN ON FIGURE 3

By: GA 8/18/2020 Checked By: RM 8/18/2020

Metro Orange Line Improvements

Sepulveda Station and Grade Separation
Historic Rainfall and Groundwater Elevation
4953-18-0121
Figure 4





Reference:

URLA Watermaster, 2017, 2015-2016 Annual Report, Watermaster Service in the Upper Los Angeles River Area (ULARA), Los Angeles County, California.

wood.

Wood

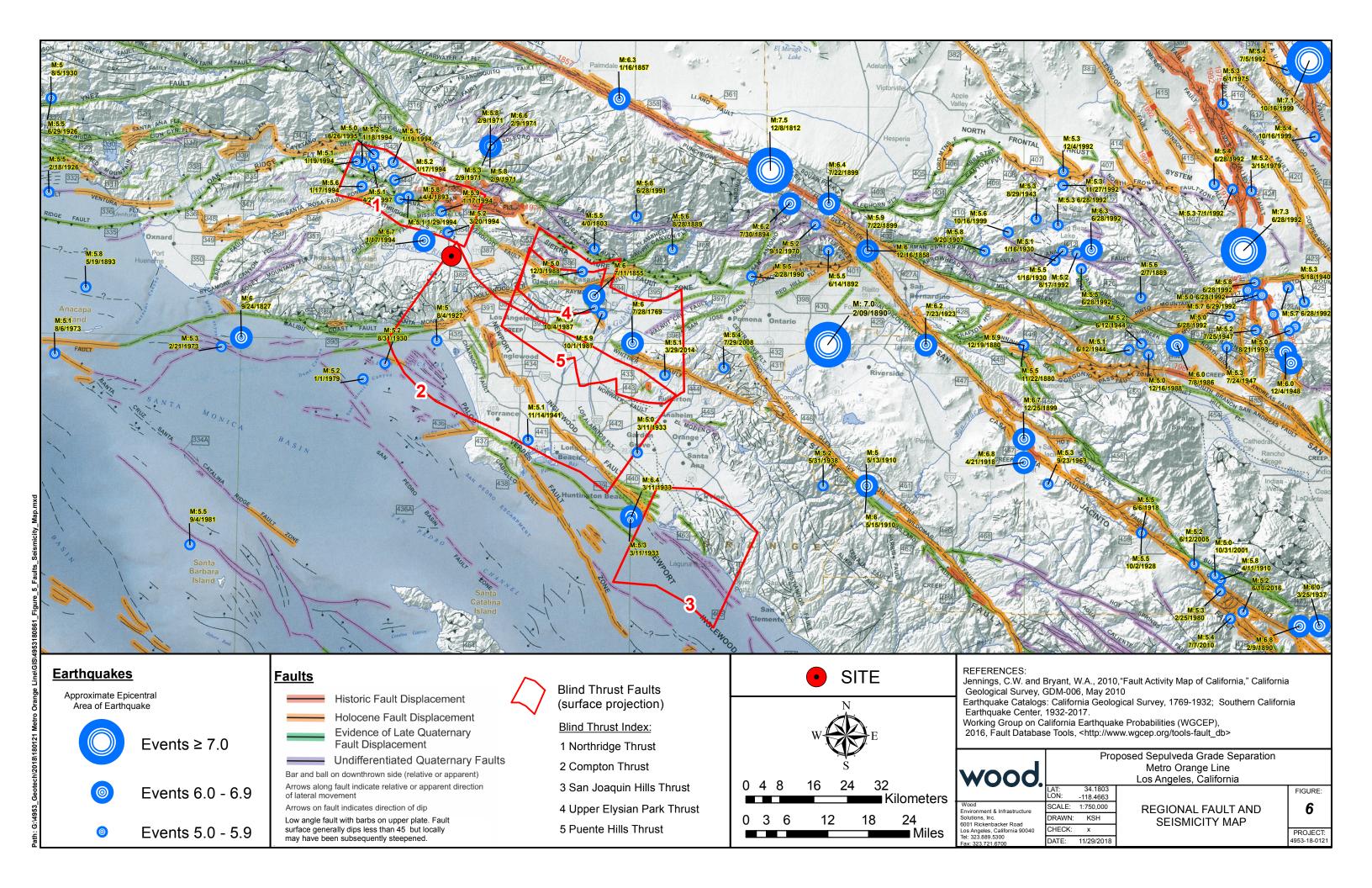
Environment & Infrastructure Solutions, Inc., 6001 Rickenbacker Rd, Los Angeles, CA 90040 Phone (323) 889-5300 Fax (323) 721-6700

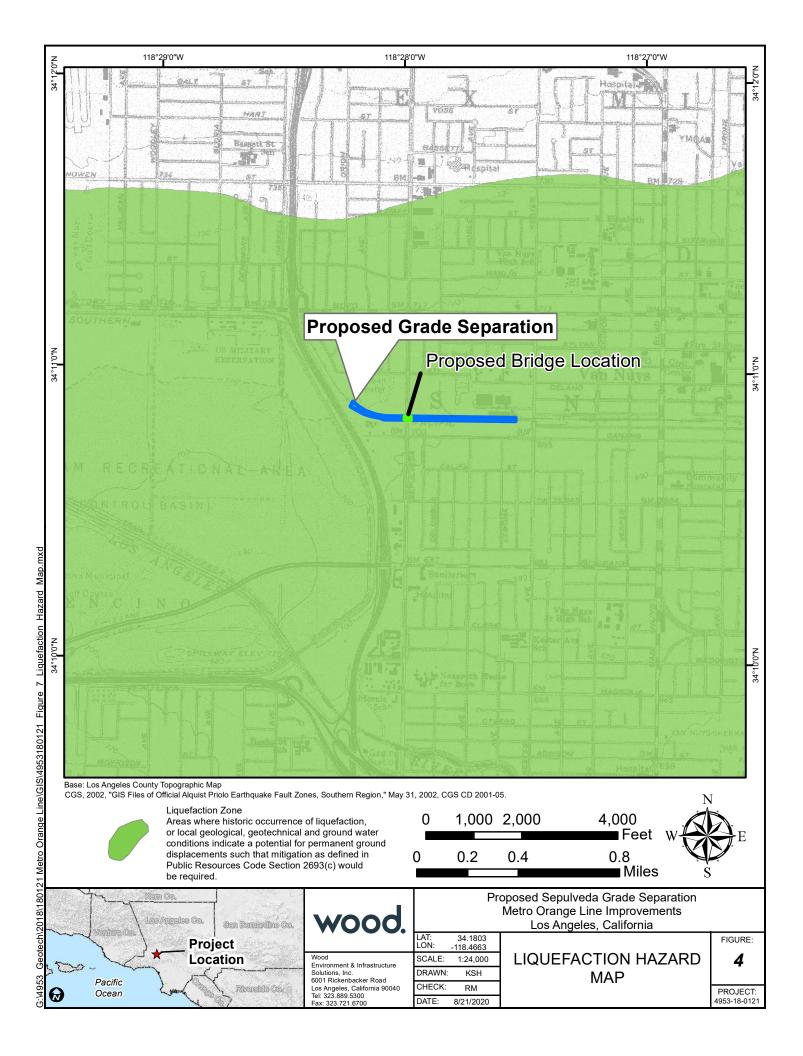
Metro Orange Line Sepulveda Grade Separation

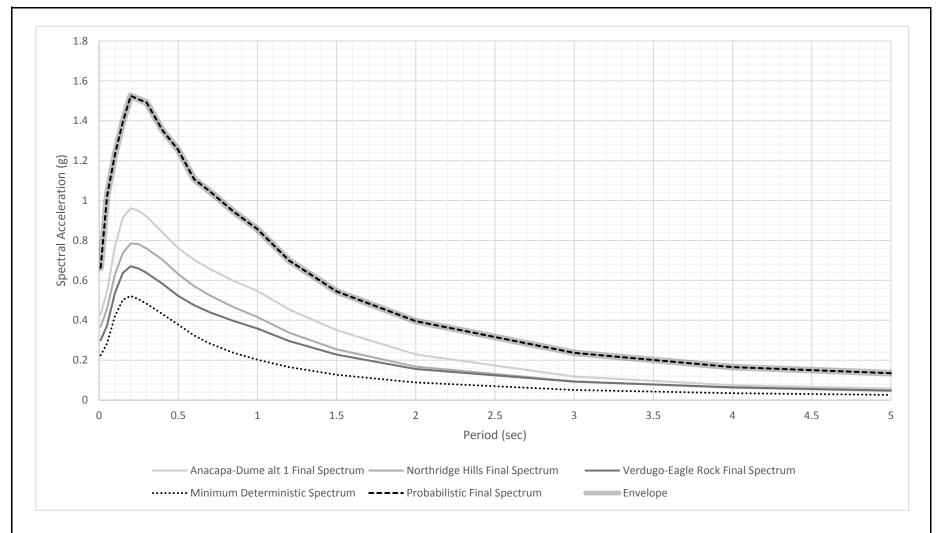
LT,LNG:	
PREPARED BY:	VMN
SCALE:	NTS
BY:	RM
CHKD:	RM
DATE:	08/24/2020

Cumulative Change in Groundwater Storage, San Fernando Basin FIGURE NO

PROJECT NO. 4953-18-0121





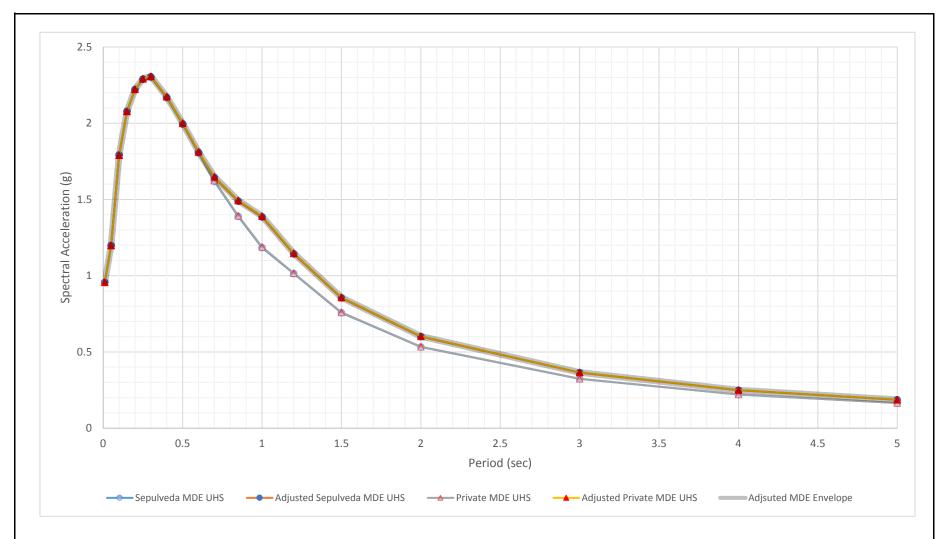


By: KSH 11/29/2018

Metro Orange Line Sepulveda Grade Separation 4953-18-0121



Caltrans ARS Response Spectra 975-year Return Period Envelope Figure

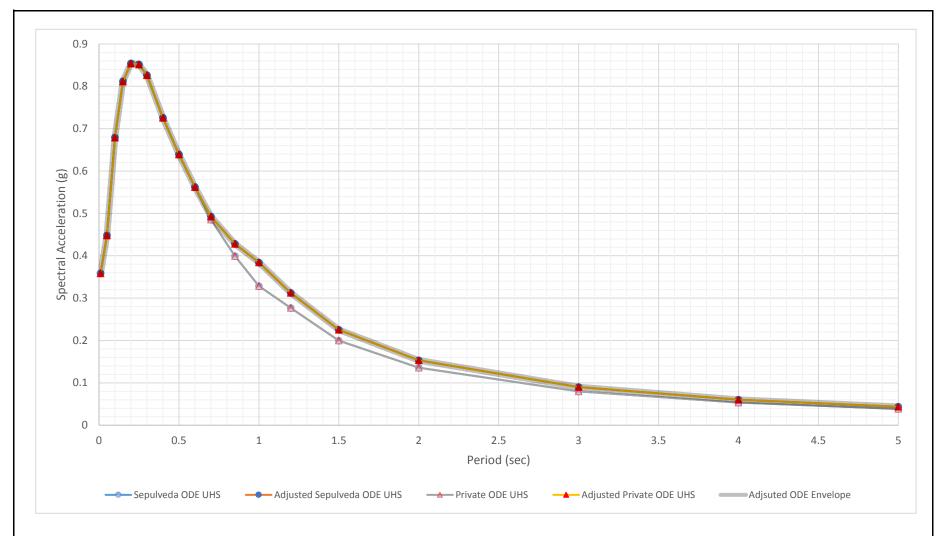


By: KSH 11/29/2018

Metro Orange Line Sepulveda Grade Separation 4953-18-0121



Adjusted Probabilistic Uniform Hazard Response Spectra
2475-year Return Period
Maximum Design Earthquake (MDE)
Figure

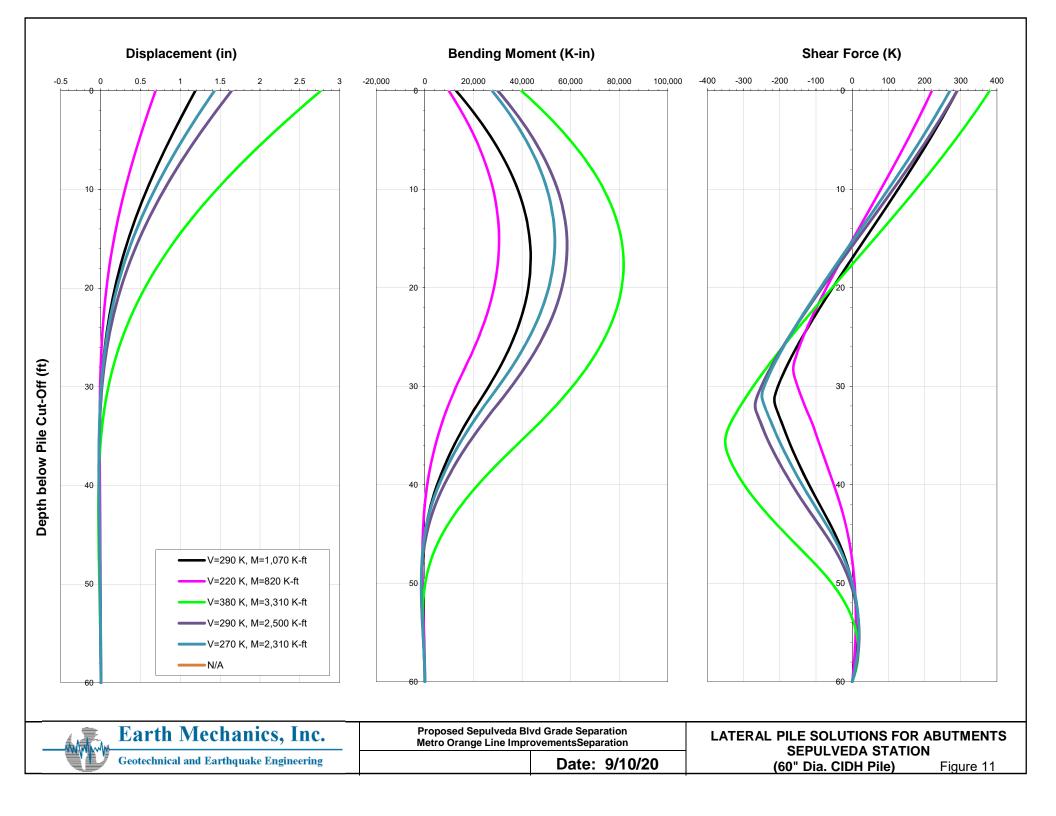


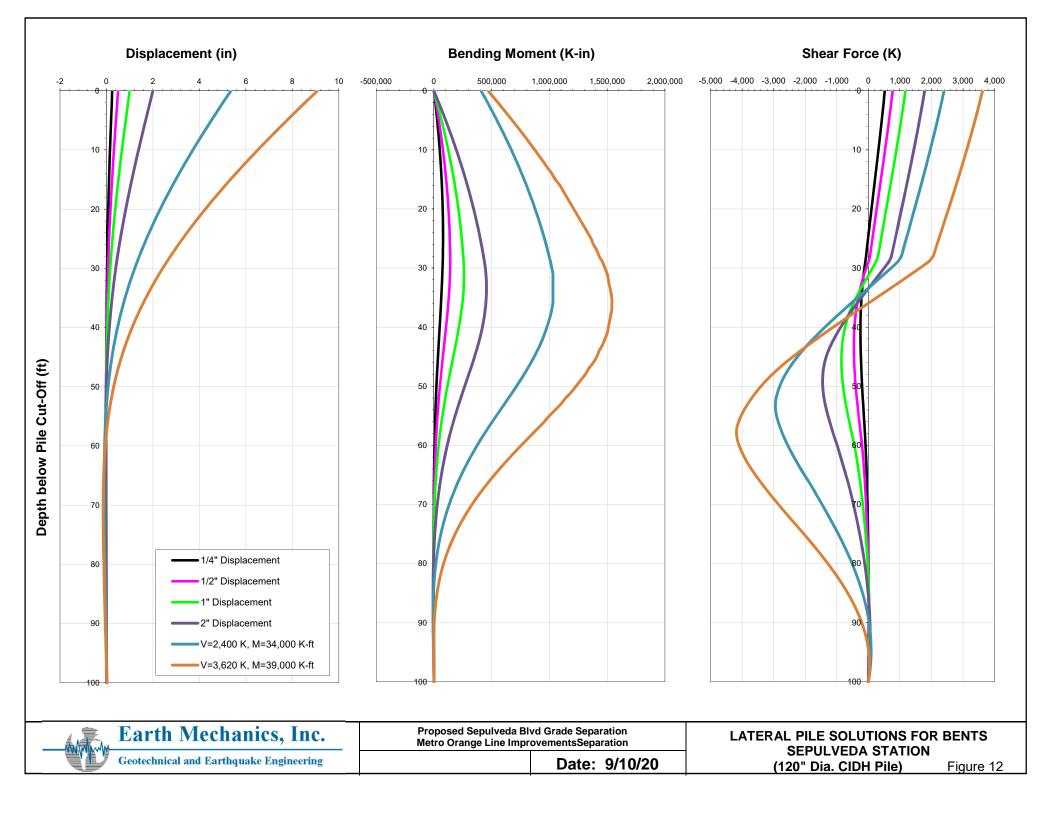
By: KSH 11/29/2018

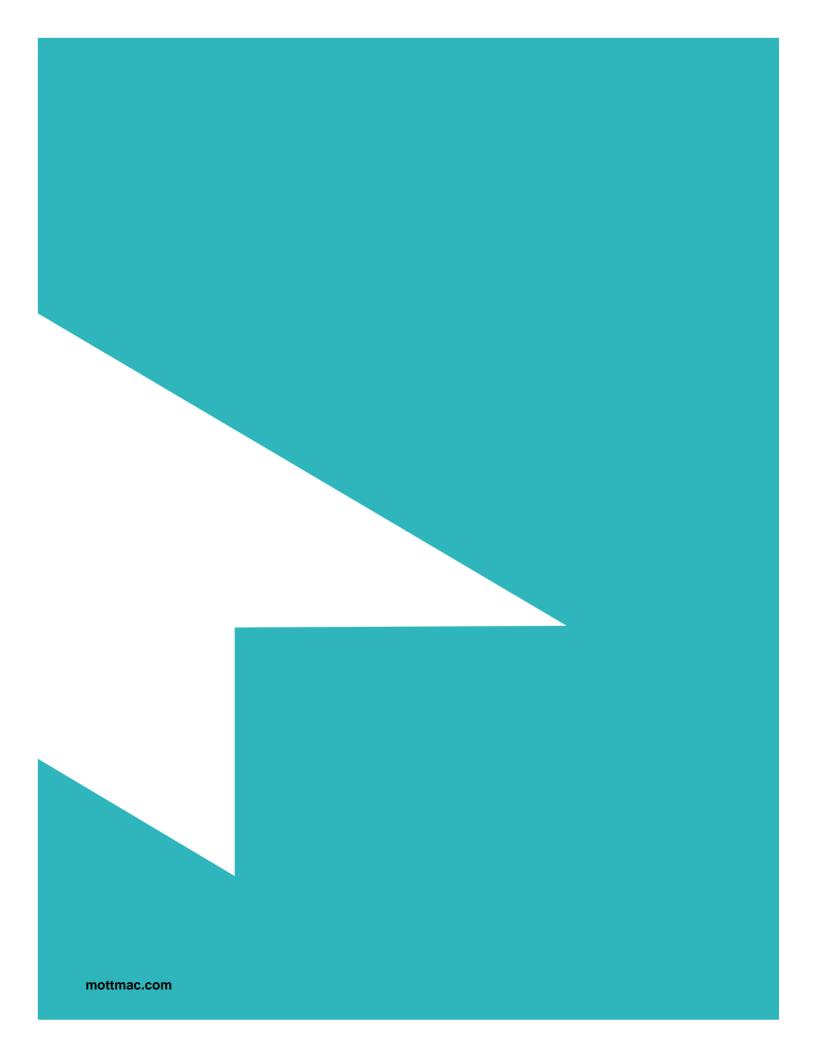
Metro Orange Line Sepulveda Grade Separation 4953-18-0121



Adjusted Probabilistic Uniform Hazard Response Spectra
150-year Return Period
Operating Design Earthquake (ODE)
Figure

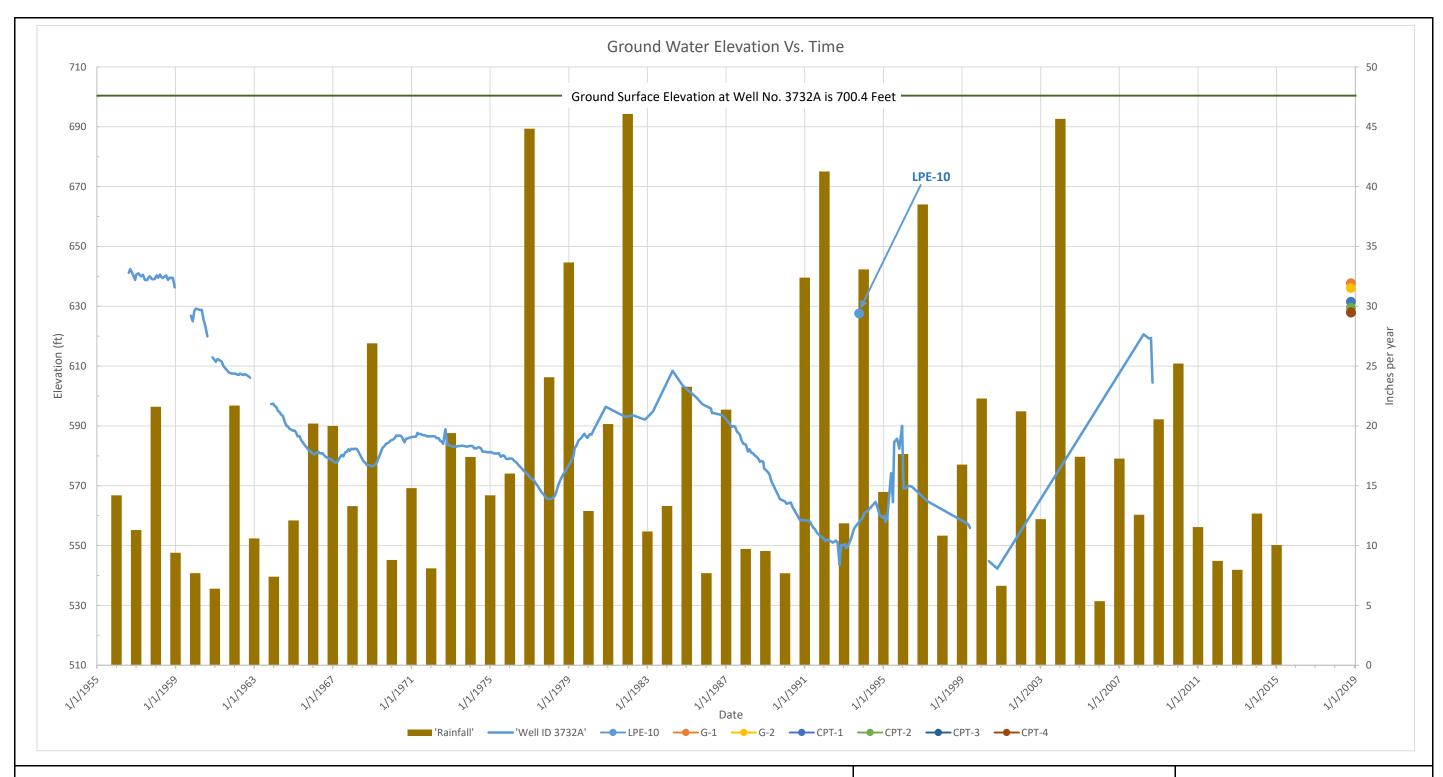






APPENDIX G

Reviewed Boring Log and Groundwater Monitoring Data for Groundwater Depth Assessment



RAINFALL AT BURBANK VALLEY PUMP PLANT RAINGAGE WELL, BORING AND CPT LOCATIONS SHOWN ON FIGURE 3

By: GA 8/18/2020 Checked By: RM 8/18/2020

Metro Orange Line Improvements

Sepulveda Station and Grade Separation
Historic Rainfall and Groundwater Elevation
4953-18-0121
Figure 4



Geosyntec D consultants

16644 West Bernardo Dr., Suite 301 San Diego, CA 92127 Tel: (858) 674-6559

Fax: (858) 674-6586

GS FORM: **BOREHOLE RECORD BORE 1/99**

BORING B-1

ELEVATION

SHEET 1 OF 2 **FT MSL**

START DATE 2/10/20 **FINISH DATE** 2/10/20

PROJECT LA Green Streets

LOCATION 12607 Victory Blvd. North Hollywood, CA

PROJECT NUMBER LA0565

ı			SAMPLES									
	DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOLIC LOG	ELEVATION (ft)	NUMBER	ТҮРЕ	BLOW COUNTS	N VALUE	% RECOVERY	TIME	COMMENTS	
		Asphalt Street, No Base. - Quaternary Young Alluvial Fan Deposits: Loose, slightly moist to moist, medium brown to brown, poorly graded, fine grained SAND with silt. (SP-SM)	SP-SM	-		BULK H					Hand Auger 0-5" Bulk Sample 0-5"	
	5 -	Dry to slightly moist, light brown, localized gravel.		- - -	1	SPT	3 4 4				PID 0.0	
	10 -	Loose to medium dense, slightly moist, light to medium brown.		- - -	2	SPT	4 6 8				PID 0.0 @12' drill rig chatter	
0	15 -	Loose, slightly moist to moist, medium brown to brown, fine grained, silty SAND. (SM)	SM	 - - - -	3	SPT	2 2 2 2				PID 0.0	
DIEGO GINT LIBRARY.GLB 2/18/20	20 -	Medium dense to dense, dry to slightly moist, light brown to medium brown, poorly graded, fine grained SAND with localized gravel. (SP)	SP	 - - - -	4	SPT	4 10 12				PID 0.1 @19' drill chatter	
BORING LOG GEOTECH (KEATON) 1_VICTORY.GPJ SAN DIEGO GINT LIBRA	25 -	Medium stiff, medium gray brown, sandy SILT, fine grained sand, slight plasticity. (ML)	ML	- - - - -	5	SPT	2 3 2				PID 0.1	
LOG GEOTECH (KE	CONTRACTOR Martini Drilling LATITUDE EQUIPMENT CME 75 8" LONGITUDE DRILL MTHD Hollow Stem ANGLE Vertical CONTRACTOR Martini Drilling LATITUDE REMARKS: Screen for infiltration installed 40'-50' REMARKS: Screen for infiltration installed 40'-50'											
BORING		IETER 8" BEARING GER DA REVIEWER DK PRINTED 2/	18/20	11	RDINATE SYS		ND ABBRE\	/IATIONS	S			

Geosyntec 🔈 consultants

GS FORM:

BORE 1/99

Fax: (858) 674-6586

BOREHOLE RECORD

16644 West Bernardo Dr., Suite 301 San Diego, CA 92127 Tel: (858) 674-6559

START DATE **FINISH DATE**

BORING

ELEVATION

SHEET 2 OF 2 **FT MSL**

PROJECT LA Green Streets

LOCATION 12607 Victory Blvd. North Hollywood, CA

PROJECT NUMBER LA0565

B-1

					SAI	MPLES					
DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOLIC LOG	ELEVATION (ft)	NUMBER	ТҮРЕ	BLOW COUNTS	N VALUE	% RECOVERY	TIME	COMMENTS	
<u>-</u>	Medium dense, moist, brown to gray brown, poorly graded silty - SAND. (SP)	SP	- - -	6	SPT	3 6 8				PID 0.1 Majority of sample previous material (ML)	
35 -	Dense to very dense, slightly moist, medium brown, well graded gravelly SAND, elevated blow counts potentially due to gravel. (SW)	sw	- - -	7	SPT	14 50 for 5"				PID 0.1 ~35'-40' drill chatter	
40 -	Gravel up to 1.5" in diameter. Dense to very dense, slightly moist, medium brown, poorly graded SAND with silt and gravel.	SP-SM		8	SPT	10 16 24				PID 0.2 42' drill chatter	
45 -	- - Gravels subangular, gravel size up to 1.25". -		- - -	9	SPT	10 17 32				PID 0.1	
50 -	Very dense, moist, medium brown to brown, well graded - SAND with gravel, gravel decreases. (SW-SM) Total Depth 51.5'	SW-SM	- - -	10	SPT	38 50 for 15"				PID 0.2	
55	No Groundwater.		- - - -								
CONTRACTOR Martini Drilling EQUIPMENT CME 75 8" LONGITUDE DRILL MTHD Hollow Stem DIAMETER 8" BEARING LOGGER DA REVIEWER DK PRINTED 2/18/20 REMARKS: Screen for infiltration installed 40'-50' COORDINATE SYSTEM: SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS											

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BORING NUMBER MW11 PAGE 1 OF 2

CL	_IENT _	Circle K Stores In	C.					PROJECT NAME Circle K Store #22	211173					
PROJECT NUMBER 200-1173-01														
DA	ATE ST	ARTED 4/9/14		COM	IPLETE	D 4/	9/14							
DF	RILLING	CONTRACTOR	Cascade											
		METHOD Hollo												
- 1		MODEL CME		-	SNAM	E Vic	tor Martinez							
		op of casing = 67						WELL PERMIT No 892242-426						
					111									
٦	(ft)	SAMPLE TYPE SAMPLE ID	BLOW COUNTS (N VALUE)	RECOVERY %	PID RESPONSE (ppm)	GRAPHIC		MATERIAL DESCRIPTION		W	ELL DIAGRAM			
-	-						0.5√ Asp	halt 6" Thick	√676.6		Traffic-Rated Vault			
- - - -	5 15:	00)		(100)	0.0		bro	l) Silty Sand: fine-grained, yellowish wn (10YR 5/4), moist; trace mica			Bentonite Chips (1.0' to 2.5')			
	0 09:	10	6-12-16	100	0.0		10.0(MI) Sandy Silt: dark yellowish brown	<u>667</u> .1		4" PVC SCH40			
/S.G		10	(28)	100			(10)	YR 4/4), moist; trace mica; sand is fine-			Blank Casing (0.5' to 65')			
S/CK 200-1173-0	5 - 09:-	15	6-6-12	100	0.0		(ML (10' to n	nedium-grained) Sandy Silt: dark yellowish brown YR 4/4), moist; trace mica; sand is fine nedium grained	657.1					
<u></u>	_ 09:	55	10-12-16 (28)	100	0.0			l) Silty Sand: fine-grained; yellowish wn (10YR 5/4), moist; trace mica						
	- 25 - 10:0	00	12-13-22	100	0.0		(SM oliv	l) Silty Sand: fine-grained, light e-brown (2.5Y 5/6); trace mica; iron le staining						
SLAES - ADMINISTRA	10:	05	12-14-16	100	0.0		oliv	l) Silty Sand: fine-grained, light e-brown (2.5Y 5/6); trace mica; iron le staining			Portland Cement - Bentonite Grout (2.5' to 60')			
5/19/14 15:40 - P:\E	10: 	0	18-16-18 (34)	100	0.0		òliv cou	l) Silty Sand: fine- to coarse-grained, e-brown (2.5Y 4/3), moist; subrounded rse grains; trace mica; trace subangular vel up to 1/4" diameter						
TD US LAB.GDT	10:: - -	20	13-13-20 (33)	100	0.0		oliv coa stai	l) Silty Sand: fine- to coarse-grained, e-brown (2.5Y 4/3), moist; subrounded rse grains; trace mica; iron oxide ning; trace subangular gravel up to 1/4" neter						
BLAES - GINT 8	10:3 - - -	30	12-12-16 (28)	100	0.0		ligh	l) Silty Sand: fine- to medium-grained, tolive-brown (2.5Y 5/4), moist; trace a; iron oxide staining						



BLAES - GINT STD US LAB GDT - 5/19/14 15:40 - P:\BLAES - ADMINISTRATIVE TECHNICAL\GINT\PROJECTS\CK 200-1173-01 VAN NUYS.GR\

Blaes Environmental 45 East Monterey Way Phoenix, AZ 85012 Telephone: (602)728 070

BORING NUMBER MW11

PAGE 2 OF 2

Telephone: (602)728 0707 Fax: (602)728 0708 CLIENT Circle K Stores Inc PROJECT NAME Circle K Store #2211173 PROJECT LOCATION 5560 Van Nuys Blvd., Van Nuys, CA **PROJECT NUMBER** 200-1173-01 PID RESPONSE (ppm) SAMPLE TYPE SAMPLE ID GRAPHIC LOG BLOW COUNTS (N VALUE) RECOVERY DEPTH (ft) TIME MATERIAL DESCRIPTION WELL DIAGRAM 50 18-12-22 0.0 (SM) Silty Sand: fine- to medium-grained, 10:35 100 (34)light olive-brown (2.5Y 5/4), moist; trace 55 <u>55.0</u> 622 16-18-22 0.0 (ML) Sandy Silt: light olive-brown (2.5Y 100 10:45 (40)5/3), moist; trace mica; sand is fine grained; trace clay 60 12-22-18 0.0 (ML) Sandy Silt: olive-brown (2.5Y 4/4), 100 10:55 (40)moist; trace mica; sand is fine to medium Bentonite Chips grained; trace clay (60' to 63') 65 65.0 13-16-21 0.0 (SP) Sand: fine- to medium-grained, light 100 11:00 (37)yellowish brown (2.5Y 6/4), moist; trace silt; trace subangular gravel up to 1" diameter Filter Pack Sand #3 10-16-22 0.0 (SP) Sand: fine- to medium-grained, light 100 11:05 (63' to 86.5') S-70-MW11 (38)olive-brown (2.5Y 5/4), moist: trace silt: trace subangular gravel up to 1" diameter 75 22-18-20 0.0 75.8 601.4 (SP) Sand: fine- to medium-grained, light 100 11:10 75-MW11 (38)olive-brown (2.5Y 5/4), moist; trace silt; trace subangular gravel up to 1" diameter (ML) Silt With Sand: light yellowish brown (2.5Y 6/3), moist to wet; sand is fine 80 80.0 grained <u>597.1</u> 4" PVC SCH40 12-18-16 0.0 (SM) Silty Sand: fine- to medium-grained, 100 11:25 Factory-Slotted (34)very dark grayish brown (2.5Y 3/2), wet to Screen 0.020" saturated; trace mica (65' to 85') 85 85.0 592.1 **Bottom Cap** 12-20-26 0.0 (ML) Silt With Sand: light olive-brown (2.5Y 100 11:40 86.5 590.6 (46)5/4), moist to wet; trace mica; sand is fine to medium grained Bottom of borehole at 86.5 feet.

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BORING NUMBER MW12 PAGE 1 OF 2

				ı ax.	(002)1	20 07 0									
		cle K Stores In					_								
		UMBER 200-													
					j, L.P.			ROUND WATER LEVEL (ft. bgs							
		IETHOD Hollo		-				DATE/TIME <u>4/17/2014 11:05:00 AM</u>							
NO	TES Top	o of casing = 6	77.34 ft. bg	S		ı	W	ELL PERMIT No 892242-426							
O DEPTH	SAN							MATERIAL DESCRIPTION WELL DIA							
							0.5 Asphalt 6	" Thick	<u>√</u> 677.3	Traffic-Rated Vault					
- - 5 - - -	10:20			(100)	0.0		(SM) Silty yellowish mica	/ Sand: fine- to medium-grained, brown (10YR 5/4), moist; trace		Bentonite Chips (1.0' to 2.5')					
10 NAN NUYS.GPJ								/ Sand: fine- to medium-grained, brown (10YR 5/4), moist; trace		4" PVC SCH40 Blank Casing (0.5' to 65')					
CK 200-1173-01	_ 09:40		20-22-23 (45)	100	0.0		(SM) Silty olive-brov	/ Sand: fine- to medium-grained, wn (2.5Y 4/3), moist; trace mica							
INICAL/GINT/PROJECTS/CK 200-1173-01 VAN NUYS.GPJ	_ 09:45 _		16-18-22 (40)	100	0.0			/ Sand: fine- to medium-grained, wn (2.5Y 4/3), moist; trace mica							
SATIVE TECHNICAL	_ 09:55		18-20-22 (42)	100	0.0			dy Silt: olive-brown (2.5Y 4/3), ce mica; sand is fine grained;	652.8						
GINT STD US LAB.GDT - 5/19/14 09:08 - P.\BLAES - ADMINISTRATIVE TECH	_ 10:00		20-14-20 (34)	100	0.0			/ Sand: fine- to medium-grained, wn (2.5Y 4/4), moist, trace mica; e staining	647.8	Portland Cement - Bentonite Grout (2.5' to 60')					
35/19/14 09:08 - P:\B	_ 10:10		11-12-17 (29)	100	0.0		light olive mica; iror subangul	/ Sand: fine- to coarse-grained, -brown (2.5Y 5/6), moist; trace n oxide staining; trace angular to ar gravel up to 1/4" diameter							
STD US LAB.GDT -	_ 10:15		18-22-22 (44)	100	0.0	000000	coarse-gi moist; tra diameter	Sand With Silt: fine- to rained, olive-brown (2.5Y 4/3), ce subangular gravel up to 1/2"	637.8						
BLAES - GINT S	_ 10:20		17-21-21 (42)	100	0.0		light olive grayish b subround (SM) Silty	-brown (2.5Y 5/4) and very dark rown (2.5Y 3/2) mottling, moist; led coarse grains / Sand: fine-grained, olive-brown), moist; trace mica							



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BORING NUMBER MW12

PAGE 2 OF 2 Phoenix, AZ 85012 Telephone: (602)728 0707 Fax: (602)728 0708 CLIENT Circle K Stores Inc PROJECT NAME Circle K Store #2211173 **PROJECT NUMBER** 200-1173-01 PROJECT LOCATION 5560 Van Nuys Blvd., Van Nuys, CA PID RESPONSE (ppm) SAMPLE TYPE SAMPLE ID GRAPHIC LOG RECOVERY DEPTH (ft) TIME MATERIAL DESCRIPTION WELL DIAGRAM 50 50.0 627.8 13-13-13 0.0 (ML) Sandy Silt: light olive-brown (2.5Y 10:30 100 (26)5/4), moist; sand is fine grained 55 12-13-15 0.0 (ML) Sandy Silt: olive-brown (2.5Y 4/4), 100 10:35 (28)moist; trace mica; iron oxide staining; sand is fine to medium grained 60 60.0 617.8 20-22-20 0.0 (SP) Sand: fine- to medium-grained, light 100 10:40 (42)yellowish brown (2.5Y 6/3), moist; trace Bentonite Chips subrounded coarse grains (60' to 63') 65 (SP) Sand: fine- to medium-grained, light 20-22-20 0.0 100 10:45 (42)olive-brown (2.5Y 5/4), moist BLAES - GINT STD US LAB.GDT - 5/19/14 09:08 - P.\BLAES - ADMINISTRATIVE TECHNICAL\GINT\PROJECTS\CK 200-1173-01 VAN NUYS.GP, 70.0 607.8 Filter Pack Sand #3 20-22-20 0.0 (ML) Sandy Silt: light olive-brown (2.5Y 100 10:55 (63' to 86.5') S-70-MW12 (42)5/3), moist; trace mica; sand is fine to medium grained 75 75.0 602.8 18-22-22 0.0 (SM) Silty Sand: fine-grained, light 11:00 100 olive-brown (2.5Y 5/6), moist to wet; trace mica; iron oxide staining (44)80 80.0 <u>597.8</u> 4" PVC SCH40 (ML) Silt With Sand: olive-brown (2.5Y 4/3), wet; trace mica; sand is fine grained 20-22-20 100 11:15 Factory-Slotted (42)Screen 0.020" (65' to 85') 85 **Bottom Cap** 18-20-22 (ML) Silt With Sand: olive-brown (2.5Y 4/3), 100 11:20 591.3 (42)wet; trace mica; sand is fine grained Bottom of borehole at 86.5 feet.

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BORING NUMBER MW13 PAGE 1 OF 2

CLIENT _Circle K Stores Inc.								PROJECT NAME Circle K Store #2211173				
PRO	IECT N	UMBER 200-1	173-01					PROJECT LOCATION 5560 Van Nuys Blvd., Van Nuys, CA				
DATE	STAR	TED 4/8/14		COM	PLETE	D 4/8/	/14					
DRIL	LING C	ONTRACTOR_	Cascade I	Drilling	j, L.P.							
DRIL	LING M	ETHOD Hollow	w-Stem Au	iger				DATE/TIME 4/18/2014 9:35:00 AM				
DRILL RIG MODEL CME 85 DRILLERS NAME Victor Martinez								LOGGED BY K. Martinez				
NOTE	S Top	of casing = 67	5.42 ft. bg	S				WELL PERMIT No 892242-426				
O DEPTH	TIME	SAMPLE TYPE SAMPLE ID	BLOW COUNTS (N VALUE)	RECOVERY %	PID RESPONSE (ppm)	GRAPHIC LOG		MATERIAL DESCRIPTION WELL DIAGRAM				
							1.3 Aspha	alt 1.33' Thick	674.6	Traffic-Rated Vault		
5	11:05			(100)	0.0		5/4), r	Sandy Silt: yellowish brown (10YR noist: micaceous; sand is fine ed; trace clay	666.4	Bentonite Chips (1.0' to 3')		
7 10	12:10			100	0.0		(SM)	Silty Sand: fine-grained, yellowish (10YR 5/4), moist; trace mica		4" PVC SCH40 Blank Casing		
GINT STD US LAB.GDT - 5/19/14 15:39 - P:\BLAES - ADMINISTRATIVE TECHNICAL\GINT\PROJECTS\CK 200-1173-01 VAN NUVS.GPJ C	10:00		7-7-10 (17)	100	0.0		(SM) dark y	Silty Sand: fine- to coarse-grained, rellowish brown (10YR 4/6), moist; unded coarse grains; trace mica	655.9	(0.5' to 65')		
GINT/PROJE	10:05		8-11-13 (24)	100	0.0		5/6), r	Sandy Silt: light olive-brown (2.5Y noist; trace mica; sand is fine to im grained; trace clay				
RATIVE TECHNICAL	10:15		9-9-13 (22)	100	0.0		olive-l	Silty Sand: fine-grained, light prown (2.5Y 5/4), moist; trace mica; xide staining	650.9			
30	10:20		13-13-22 (35)	100	0.0		(2.5Y	Silty Sand: fine-grained, olive-brown 4/4), moist; trace mica; trace unded gravel up to 1/4" diameter		Portland Cement - Bentonite Grout (3' to 60')		
25/19/14 15:39 - P:\B	10:25		12-16-22 (38)	100	0.0		olive-l trace to 1/4	Silty Sand: fine- to coarse-grained, prown (2.5Y 4/4), moist; trace mica; subrounded to subangular gravel up " diameter				
91D US LAB.GDT	10:35		12-15-18 (33)	100	0.0		coars	SM) Sand With Silt: fine- to e-grained, olive-brown (2.5Y 4/4), trace mica	635.9			
8LAES - GINT 8	10:40		14-18-22 (40)	100	0.0		coars	SM) Sand With Silt: fine- to e-grained, olive-brown (2.5Y 4/4), trace mica				



BLAES - GINT STD US LAB GDT - 5/19/14 15:39 - P:\BLAES - ADMINISTRATIVE TECHNICAL\GINT\PROJECTS\CK 200-1173-01 VAN NUYS.GR\

Blaes Environmental 45 East Monterey Way Phoenix, AZ 85012 Telephone: (602)728 0707

BORING NUMBER MW13

PAGE 2 OF 2

Fax: (602)728 0708 CLIENT Circle K Stores Inc PROJECT NAME Circle K Store #2211173 **PROJECT NUMBER** 200-1173-01 PROJECT LOCATION 5560 Van Nuys Blvd., Van Nuys, CA PID RESPONSE (ppm) SAMPLE TYPE SAMPLE ID GRAPHIC LOG BLOW COUNTS (N VALUE) RECOVERY DEPTH (ft) TIME MATERIAL DESCRIPTION WELL DIAGRAM 50.0 50 625.9 18-20-21 0.0 (SM) Silty Sand: fine- to medium-grained, 10:50 100 (41)olive-brown (2.5Y 4/3), moist; trace mica; trace subrounded gravel up to 1/4" diameter 55 12-14-19 0.0 (SM) Silty Sand: fine-grained, light 100 11:00 (33)olive-brown (2.5Y 5/6), moist; trace mica 60 60.0 615.9 12-18-16 0.0 (SW) Sand: fine- to coarse-grained, 100 11:05 (34)grayish brown (2.5Y 5/2), moist; Bentonite Chips subrounded; trace silt; trace subrounded (60' to 63') gravel up to 2" diameter 65 <u>65.0</u> 12-14-18 0.0 (SP-SM) Sand With Silt: fine- to 100 11:10 S-65-MW13 (32)medium-grained, light olive-brown (2.5Y 5/3), moist; iron oxide staining 70 70.0 605.9 Filter Pack Sand #3 (ML) Sandy Silt: light olive-brown (2.5Y 5/4), moist; sand is fine grained SS 12-18-16 0.0 71.0 604.9 100 11:25 (63' to 86.5') S-70-MW13 (34)(SP) Sand: fine- to medium-grained, light yellowish brown (2.5Y 6/4), moist; iron oxide staining 75 75.0 600.9 18-14-16 0.0 11:30 (SM) Silty Sand: fine-grained, very dark 100 -75-MW13 grayish brown (2.5Y 3/2), moist to wet; trace mica (30)80 80.0 <u>595</u>.9 4" PVC SCH40 12-14-16 0.0 (ML) Silt With Sand: olive-brown (2.5Y 4/3), 100 11:40 Factory-Slotted (30)moist; trace mica; iron oxide staining; sand Screen 0.020" is fine grained (65' to 85') 85 85.0 590.9 **Bottom Cap** 12-14-18 (SM) Silty Sand: fine- to medium-grained, olive-brown (2.5Y 4/3), wet; trace mica 0.0 100 12:05 86.5 589.4 (32)Bottom of borehole at 86.5 feet.



DRILLING COMPANY: Water Development Corporation

8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well SVE-1

1 of 3

PROJECT: Sawyer Petroleum SURFACE ELEVATION: Not Measured

LOCATION: 14117 AETNA ST., VAN NUYS, CA TOTAL DEPTH: 151 5 feet BORING DIAMETER: 8 inches

PROJECT NO: 06 202 DEPTH TO FIRST SATURATION: N/A

DATE BEGAN: 9/7/06 FINISHED: 9/12/06 TOP OF WELL CASING ELEVATION: N/A

STATIC GW ELEVATION: DATE: N/A DRILLING METHOD: Hollow-Stem Auger LOGGED BY: E. Kuhn CHECKED BY: D. Henry

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DЕРТН (feet)	Well Diagram
5						AIRKNIFED TO 7 FEET				well box encased in concrete
10 —	I	SVE-1d10	1019	10/12/15	0.0	SILT with Sand - dark brown [10YR 3/3], very stiff moist; fine- to medium-grained; trace clay SILT - dark brown [10YR 3/3], very stiff, moist; trace clay, trace amount of fine gravel; trace fine-to medium-grained sand	ml		10 11 11	blank 4 inch dia. SCH 80 PVC from 0-130 feet
20	T	SVE-1 d15 SVE-1d20	1027	11/15/20 15/15/20	0.0	Sandy SILT - dark brown [10YR 3/3] dense, moist; fine- to medium-grained sand; trace clay	i mi		20	neat cement from 1-45 feet
25		VE-1d25	1053	15/18/22	0.0		n a se a s		25	
35 11		√E-1d35 √E-1d35	1109	15/17/25	00	SILT - dark yellowish brown [10YR 3/4] very stiff moist; trace clay; trace fine- to medium-grained sand. dark brown [7 5YR 3/4] hard	ml little		35 11 1	
40				10/16/22	2.3	Silty SAND - fine- to medium-grained, very dark grayish brown [10YR 3/2], dense moist; trace amount of fine gravel	sm III		5	
50 1				17/17/18 25/25/30	25.1	SAND - fine- to coarse-grained, yellow brown [10YR 5/4], dense, moist. SILT with Sand - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand; trace clay	SP M	5		bentonite chips from 45-48 feet
Remarks.	/Note	es: 1) PIC	Used:				J		十	



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Log of Boring/Well SVE-1

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/7/06

FINISHED: 9/12/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

						y other location there may be consequential changes in o					
DEPTH	(reet) Samples	Sample I D.	Time	Blow Counts (per 6 inches)	(bpm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	W	/ell Diagram
55		SVE-1d55	1310	20/25/25	22.8	Sandy SILT - dark brown [10YR 3/3]. hard moist; fine- to medium-grained sand; very dark grayish brown [10YR 3/3];			55		
60	111111111111111111111111111111111111111	SVE-1d60	1407	10/12/20	597	dark brown [10YR 3/3] trace amount of fine gravel;			60		#2/12 sand filter pack from 48-72 feet
65	بالبليليل					no sample recovery at 65 feet			65		
70 -	111111111111111111111111111111111111111	SVE-1d70 —	1031	13/20/25	180	SILT with Sand - dark yellowish brown [10YR 3/4], hard, moist, fine- to medium-grained sand;	ml		70 —		bentonite chips fram
75 -	- 1 - 1 - 1 - 1 - 1	SVE-1d75	1043	32/50	39 6	SILT - dark brown [10YR 3/3], hard, moist, trace fine- to medium-grained sand; trace amount of fine gravel.	m!		75		72-75 feet
80 -		SVE-1d80	1103	20/23/27	134	fine gravel SILT with Sand - very dark grayish brown [10YR 3/2], hard, moist; fine- to medium-grained sand;	ml		80 		
85 -	- <u> </u>	SVE-1d 85—	1122	19/20/21	29.4	trace amount of fine gravel. Silty SAND - fine- to medium-grained, brown	sm·		85— -		
90 -		SVE-1d90	1136	25/50	46 4	[10YR 4/3], dense moist; trace amount of fine and coarse gravel; olive brown [2.5Y 4/3], very dense. SAND with Gravel - fine- to coarse-grained dark	ml		90 — 1 1		
95 —	- 1	SVE-1d95	1331	20/22/25	63.8	grayish brown [2 5Y 5/2], very dense moist; fine and coarse gravel Sandy SILT - brown [10YR 4/3], hard, moist;	ml		95 1 		į
100 —				:		fine- to medium-grained sand; trace clay. SILT with Sand - olive brown [2 5Y 4/3] hard, moist; fine-grained sand	ml	100			−neat cement from 75-125 feet
105		- 10100 -	1356	<u> 19/22/26</u>	64.8	SILT - dark olive brown [2 5Y 3/3], hard, moist; trace fine- to medium-grained sand.	ml	10	25		
- - 110 —	s	:VE-1 d105	1458	35-50	2.1	Sandy SILT - dark brown [7 5YR 3/3] hard moist; fine- to medium-grained sand	ml magana	11			
- -	s L	VE-1d110	1523	22/23/27	17	brown [10YR 4/3] trace amount fine gravel	ersulers learns.		1		
Rema	erks/No	rtes: 1) Pi	D Used:							P	age of 3
										2	of 3



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Log of Boring/Well SVE-1

PROJECT: Sawyer Petroleum

PROJECT NO.: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/7/06

FINISHED: 9/12/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

<u> </u>				t	ime or at any	y other location, there may be consequential changes in co	nditions			
DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
120 125 130 140 155 160 170 175		SVE-1d115	1533	面 Š	15	Silty SAND - fine- to medium-grained brown [10YR 4/3], dense, moist SAND - fine- to coarse-grained light ofive brown [2 5Y 5/3] dense, moist Silty SAND - fine- to medium-grained ofive brown [2 5Y 4/4] very dense, moist SILT with Sand - dark brown [7 5YR 3/4] hard moist; fine- to medium-grained sand Silty SAND - fine- to medium-grained dark brown [7 5YR 3/4], dense moist SAND with Silt - fine- to medium-grained, yellowish brown [10YR 5/4] very dense moist Silty SAND - fine- to medium-grained dark yellowish brown [10YR 4/4] very dense moist; trace amount of fine gravel SILT with Sand - dark yellowish brown [10YR 3/4], hard, moist; fine-grained sand. Bottom at 151 5 feet	sm sp sm		120 125 130 135 140 145 151	bentonite chips from 125-128 feet #2/12 sand filter pack from 128-151 5 feet screened (0.02 inch slots) 4 inch dia SCH 80 PVC from 130-150 5 feet
Remark	s/Not	es: 1) PID	Used:							Page 3 of 3



DRILLING METHOD: Hollow-Stem Auger

WAYNE PERRY, INC.

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Log of Boring/Well SVE-2

1 of 3

LOGGED BY: E. Kuhn CHECKED BY: D. Henry

PRO JECT: Sawyer Petroleum SURFACE ELEVATION: Not Measured

LOCATION: 14117 AETNA ST., VAN NUYS, CA TOTAL DEPTH: 152 feet BORING DIAMETER: 8 inches

PROJECT NO: 06.202 DEPTH TO FIRST SATURATION: N/A

DATE BEGAN: 9/5/06 FINISHED: 9/7/06 TOP OF WELL CASING ELEVATION: N/A

DRILLING COMPANY: Water Development Corporation STATIC GW ELEVATION: DATE: N/A

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

					into or at any	other location, there may be consequential changes in ou				
DEPTH (feet)	Samples	Sample I.D	Тіте	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
		į				AIRKNIFED TO 7 FEET				well box encased in concrete
5—						SILT with Sand and Clay - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to	ml	Z	5	
10	Į	SVE-2d10	1049	6/6/10	-0.1	medium-grained sand; trace amount of fine gravel SILT with Sand - dark yellowish brown [10YR]	ml		10 -	
15	Į	SVE-2d15	1103	5/8/10	0.0	3/4], very stiff, moist; fine- to medium-grained sand; trace clay			15—	
20	Į,	SVE-2d20	1114	6/10/12	0.0	Sandy SILT with Clay - dark brown [10YR 3/3]	mi	2 2 2 2 3 3	20 -	neat cement from 1-45 feet
25		VE 2d25	1117	12/15/15	0.0	very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel Sandy SILT - dark brown [10YR 3/3] very stiff,	ml	2	25	
30	֡֞֜֞֜֞֜֞֜֞֜֞֟֟֓֓֓֟֟	WE 2420	1126	16/20/23	0.6	moist; fine- to medium-grained sand; trace clay	114		30 —	
35 -1		SVE-2d30 —	1128	10/£U/£ŏ	0.6	SILT with Sand - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand; trace clay	mi		35	blank 4 inch dia, SCH 80 PVC from 0-130
40	≤ ε	VE-2d35	1134	10/16/20	0.5	SILT with Sand - very dark grayish brown [10YR 3/2] hard moist; fine- to medium-grained sand	mi		40	feet so PVC from 0-130
45	S	VE-2d40 /	1255	17/20/22	45 0				1	
45	S S	VE-2d45	307	22/23/25	-76.7	Silty SAND - fine- to medium-grained olive brown [2 5Y 4/4] dense moist.	sm		긬	bentonite chips from 45-48 feet
50	S S	VE-2d50	316	18/25/21	72		ml		50 - 11 - 11 - 11	#2/12 sand filter pack from 48-71 feet
Remarks	/No	tes: 1) Pil) Used:	 !		•				Page



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Log of Boring/Well SVE-2

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/5/06

FINISHED: 9/7/06

2 of 3

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

		ti	me or at any	other location, there may be consequential changes in co	nditions.			
DEPTH (feet) Samples O I o	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soif Class	Graphic Log	DEPTH (feet)	Well Diagram
55	1321	12/14/16	116	SILT with Clay - dark brown [10YR 3/3], hard moist; trace fine- to medium-grained sand Silty SAND - fine- to medium-grained, dark olive brown [2 5Y 3/3] dense moist;	sm		55 -	
60 SVE-2d60	1331	16/19/22	325				60-	
65 - T	1338	20/23/23	85 2	trace amount of fine gravel			65	
70	1412	12/14/18	35.4	Sandy SILT - dark olive brown [2 5Y 3/3] hard moist; fine- to medium-grained sand	ml		75	bentonite chips from 71-73 feet
SVE-2d75	1425	12/20/20	9.1	Silty SAND - fine- to medium-grained, dark olive brown [2.5Y 3/3], dense, moist; trace clay. SAND with Gravel - fine- to coarse-grained, dark grayish brown [2.5Y 4/2] dense moist; fine to coarse gravel.	sp sp		80 —	
85 - T - SVE-2d85		12/14/19 35/51	3.4	SAND with Silt and Gravel - fine- to coarse-grained, dark grayish brown [10YR 4/2] dense, moist; fine to coarse gravel. Silty SAND - fine- to medium-grained, dark brown [10YR 3/3] dense, moist; trace amount of fine gravel; very dark grayish brown [10YR 3/3], very dense;	E sm		85	
90	1506	35/50	0.0	olive brown [2 5Y 4/3].			90 1 1 1 1 1 1 1 1 1	
95 SVE 2d95		19/23/22	112	SILT - dark olive brown [2.5Y 3/3], hard, moist; trace clay; trace amount of fine gravel; trace fine-to medium-grained sand	ml		100	neat cement from 73-125 feet
SVE-2d100	Was	16/20/20	73				105	
SVE-2d105		12/15/19 13/25/27	2.6	Silty SAND - fine- to medium-grained, dark brown [7 5YR 3/4], dense moist; trace amount of fine gravel; very dense. SILT with Sand - dark brown [7 5YR 3/3] hard moist; fine- to medium-grained sand	sm ml		110 111 1	
Remarks/Notes: 1) P	ID Used:	į						Page



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Log of Boring/Well SVE-2

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/5/06

FINISHED: 9/7/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
120 —		VE 2d116	0927	18/20/22	22:4	Sandy SILT - dark grayish brown [10YR 4/2] hard moist; trace amount of fine gravel	ml		120	
125			0942	23/50	144	SAND - fine- to medium-grained yellowish brown [10YR 5/4] dense, moist;	sp		125	bentonite chips from 125-128 feet
130 —	S	VE-2d125	0951	25/23/28	79.2	very dense. Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense, moist	sm		130	bentonite chips from 125-128 feet
135 —	\$\	√E-2d130	1000	19/23/28	59.4	Sandy SILT - dark olive brown [2 5Y 3/3], hard moist, fine- to medium-grained sand; trace clay	ml		135 —	#2/12 sand filter pack from 128-152 feet
140 —	S\	/E-2d135	1013	21/24/25	-29.3	Silty SAND - fine- to medium-grained, very dark grayish brown [10YR 3/2] dense, moist	sm		140	## 120-132 RBR
145 —	SV	/E-2d140	1034	20/27/30	25.9	SAND - fine- to coarse-grained, yellowish brown [10YR 5/4], very dense, moist; trace amount of fine gravel	sp		 145	screened (0.02 inch
150 —	≥≤ sv	/E-2d145	1056	23/50	62	Silty SAND with Gravel - fine- to coarse-grained very dark grayish brown [10YR 3/2], very dense, moist; fine gravel	sm		150	screened (0.02 inch slots) 4 inch dia SCH 80 PVC from 130-150.5 feet
155 —	≥≤ sv	'E-2d150	1103	23/29/33	-5.4	SILT with Sand - very dark grayish brown [10YR 3/2], hard, moist; fine- to medium-grained sand; trace amount of fine gravel. Bottom at 152 feet	-ml_		155 155 157 1	
65		:							160 160	
70 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								1	70 - 1	
75 —								1	75	_
Remark	(s/Note	es: 1) PIC) Used:				·			Page 3 of 3



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12.6

20/23/27

W-8d50

Remarks/Notes:

1110

1) PID Used:

Log of Boring/Well W-8

Page 1 of 4

www.wpinc.com SURFACE ELEVATION: Not Measured PROJECT: Sawyer Petroleum TOTAL DEPTH: 193 feet BORING DIAMETER: 10 inches LOCATION: 14117 AETNA ST., VAN NUYS, CA DEPTH TO FIRST SATURATION: 173 feet PROJECT NO: 06 202 TOP OF WELL CASING ELEVATION: N/A DATE BEGAN: 9/12/06 FINISHED: 9/18/06 DATE: N/A DRILLING COMPANY: Water Development Corporation STATIC GW ELEVATION: DRILLING METHOD: Hollow-Stem Auger LOGGED BY: E. Kuhn CHECKED BY: D. Henry This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions w Counts • 6 inches) Well Diagram Sample I D (M/wdd) Graphic Log DEPTH (feet))EPTH (feet) Geologic Description E. Blow (per 6 AIRKNIFED TO 7 FEET well box encased in Sandy SILT with Gravel - dark brown [7.5YR 3/3], hard moist; fine- to medium-grained sand; fine gravel 10 10/13/20 SILT with Sand - brown [7 5YR 4/4], hard, moist; fine-grained sand; trace amount of fine gravel 15 9/15/20 Sandy SILT - dark brown [7 5YR 3/3]. hard, ml moist; fine- to medium-grained; trace clay 20 SILT with Sand - dark brown [7 5YR 3/3], hard moist; fine- to medium-grained sand; trace clay 25 blank 4 inch dia. SCH 80 PVC from 0-160 25 13/17/18 Silty SAND - fine- to medium-grained, dark mi brown [7 5YR 3/4], dense, moist; trace amount of fine gravel 30 30 Clayey Silty SAND - fine- to medium-grained sm dark brown [7 5YR 3/4] dense moist; trace amount of fine gravel. 35 35 15/15/20 SILT - dark brown [7.5YR 3/4] hard, moist; trace ml amount of fine-grained sand. 40 Clayey Sandy SILT - dark yellowish brown [10YR mi 3/41, hard, moist; fine- to medium-grained sand 45 mi 15/19/22 SILT - very dark brown [10YR 2/2], hard, moist. Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 4/4] dense, moist; dark brown [10YR 3/3] very dense.



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Log of Boring/Well W-8

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/12/06

9/18/06 FINISHED:

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

			ime or at any	other location, there may be consequential changes in co	naitions			<u> </u>
	imple June	Blow Counts (per 6 inches)	(ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
55	55 1117	15/18/31	15	¬ Clayey Sandy SILT - very dark grayish brown	mi_		55 —	
60 -		į		\[[10YR 3/2] hard moist; fine- to medium-grained sand. \] Sandy SILT - dark brown [10YR 3/3] hard moist; fine- to medium-grained sand; trace amount	ml		60	
65 — W 86	60 1129	10/18/24	12.9	of fine gravel. Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense moist; trace amount of fine gravel	sm		65—	
W-8c	65 1227	20/25/37	63 1				70-	
70 - T - W-86	702	14/30/37	1.8	Clayey Silty SAND - fine- to medium-grained, strong brown [7 5YR 3/4], very dense moist; trace amount of fine and coarse gravel	sm			
75 — W-8d	75 1307	33/50	206	Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense moist	sm		75 —	neat cement from 1-153 feet
80 - W-8d	30 1339	19/20/25	15.8				80	
85 W-8d	1418	35/50	197	Clayey SILT - dark gray [10YR 4/1] hard moist	ml		85	
90 W 8d	1423	20/27/42	24.9	SILT - dark grayish brown [2 5Y 4/2], hard	ml :		90	
95 — W-8e	5 1436	22/31/38	85.9	moist.			95	
100	3 1438	22/31/30	00.0	Silty SAND - fine- to medium-grained olive brown [2.5Y 4/3] very dense moist	sm		100	
W-8d1	00 1443	25/50	34	Sandy SILT with Clay - dark olive brown [2 5Y 3/3] hard, moist, fine- to medium-grained sand	mi		105—	
₩ 8d4	1458	10/25/33	12.9	Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/6], very dense, moist; trace amount of fine gravel.	sm		111111	
110 - W 8d1	1506	29/25/35	3.9	Clayey Sandy SILT - olive brown [2.5Y 4/4], hard moist; fine- to medium-grained sand	ml		10-1	
Remarks/Notes;	1) PID Used:		į			ONESSE DE		realless
ramanamores.	יון ווין טאפע.						- 1	Page

Page 2 of 4



8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well W-8

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/12/06

FINISHED:

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions.

		tin	ne or at any	other location there may be consequential changes in c	onditions.			
DEPTH (feet) Samples	Time	Blow Counts (per 6 inches)	(ppm/%)	Geologic Description	Soil Class	Graphic Log	DEРТН (feet)	Well Diagram
120 — Wed115 — Wed135 — Wed135 — Wed155	1112 19 1122 16 1339 18/ 1401 19/ 135 18/	9/17/24 9/17/24 9/17/24	(Gld vid) 0.9	SILT with Clay and Sand - brown [10YR 4/3]. hard moist; fine- to medium-grained sand; no sample recovery at 120 feet; Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense moist; dark brown [10YR 3/3] dense trace amount of fine gravel; no sample recovery at 140 feet Clayey SILT - dark olive brown [2 5Y 3/3], hard moist; trace fine- to medium-grained; trace amount of fine gravel. Sandy SILT with Clay - dark olive brown [2.5Y 3/3], very dense, moist; fine- to medium-grained. Clayey SILT with Sand - dark brown [10YR 3/3], hard moist; fine- to medium-grained Sandy Clayey SILT with Gravel - dark grayish brown [10YR 4/2], hard, moist; fine- to coarse-grained sand; fine gravel. Clayey Sandy SILT - dark olive brown [2.5Y 3/3], hard, moist; fine- to medium-grained sand. Clayey SILT - dark olive brown [2.5Y 3/3], hard, moist; fine- to medium-grained sand; very moist; trace amount of fine-grained sand;	E E E E E E E E E E E E E E E E E E E		(a) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	—bentonite chips from 153-157 feet #2/12 sand filter pack from 157-193 feet
Remarks/Notes: 1) PID) Used:							Page 3 of 4



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Log of Boring/Well W-8

PROJECT: Sawyer Petroleum

PROJECT NO: 06 202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/12/06

FINISHED: 9/18/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

l		_		me or at any	other location, there may be consequential changes in co	nations			<u> </u>
DEPTH (feet) Samples	Sample ID	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
180	W-8d175	1506	20/20/25	0.0	saturated; trace amount of fine- to medium-grained sand			180—	screened (0 02 inch
185	₹ W 8d180	1543	19/20/29	0.0	Sandy SILT - olive brown [2 5Y 4/4] hard moist; fine- to medium-grained sand	ml		185	screened (0 02 inch slots) 4 inch día SCH 80 PVC from 160-190 5 feet
	≤ W-8d185	1611 1	-18/19/30 -	0.0	Clayey SILT with Sand - olive brown [2 5Y 4/3]. hard moist; fine- to medium-grained sand	ml		-	
190	W-8d190	1620	-19/25/25 	0.0	Silty SAND with Clay - fine- to medium-grained dark brown [7.5YR 3/4], dense, moist.	sm		190 —	
195					Bottom at 193 feet			195	
200 -								200 —	
205 —								205—	
210 —								210	
215								215—	
220 —								220	
225 —								225	
230								230	
								بايليانا	
235 —								235	
Remarks/l	Notes: 1) PII	O Used:							Page

Page 4 of 4



Remarks/Notes: 1) PID Used:

WAYNE PERRY, INC.

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Log of Boring/Well W-9

Page 1 of 4

www wpine com		
PROJECT: Sawyer Petroleum	SURFACE ELEVATION: Not	Measured
LOCATION: 14117 AETNA ST., VAN NUYS, CA	TOTAL DEPTH: 193 feet	BORING DIAMETER: 10 inches
PROJECT NO: 06.202	DEPTH TO FIRST SATURATION	ON: 170 feet
DATE BEGAN: 9/18/06 FINISHED: 9/29/06	TOP OF WELL CASING ELEV	ATION: N/A
DRILLING COMPANY: Water Development Corporation	STATIC GW ELEVATION:	DATE: N/A
DRILLING METHOD: Hollow-Stem Auger	LOGGED BY: E. Kuhn CHE	CKED BY: D. Henry
This log is a representation of subsurface cor time or at any other location, the	nditions at the time and place of drilling. With the may be consequential changes in conditions	ne passage of

Blow Counts (per 6 inches) Well Diagram Sample JD/LEL PID/LEL Graphic Log Geologic Description DEPTH (feet) Soil <u>a</u> AIRKNIFED TO 7 FEET -well box encased in concrete Clayey SILT - very dark grayish brown [2 5Y 3/2], very stiff moist; trace fine- to medium-grained sand; trace fine gravel. W-9d10 10/13/17 00 0957 15 Sandy SILT - dark brown [7 5YR 3/3], hard moist; fine- to medium-grained sand 20 19/20/21 Clayey Sandy SILT - dark brown [7.5YR 3/3] hard moist; fine- to medium-grained sand 25 Clayey SILT - dark brown [10YR 3/3], hard moist; trace fine- to medium-grained sand 30 Silty SAND - fine- to medium-grained dark <u>sm</u> mi 1028 17/17/20 W-9d30 brown [7.5YR 3/4], dense, moist.
SILT with Clay - dark brown [10YR 3/3], hard, moist; trace fine- to medium-grained sand 35 00 W-9d35 1038 15/16/20 -blank 4 inch dia. SCH 80 PVC from 0-160 feet 40 Clayey SILT - dark brown [7 5YR 3/3] hard, ml ml 18/23/28 W-9d40 1054 moist; trace fine- to medium-grained sand; trace amount of fine gravel. Sandy SILT - very dark brown [10YR 2/2] hard. 45 moist; fine- to medium-grained sand Silty SAND - fine- to medium-grained, very dark brown [10YR 2/2], dense moist 50 50 7/20/23 ml



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Log of Boring/Well W-9

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/18/06

FINISHED: 9/29/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions

			.=	nie or acany	votner location there may be consequential changes in to	iditions	-		· · · · · · · · · · · · · · · · · · ·
DEPTH (feet) Samples	Sample I D	Time	Blow Counts (per 6 inches)	PtD/LEL (ppm/%)	Geologic Description	Soli Class	Graphic Log	DEPTH (feet)	Well Diagram
55 60	W-9d55	1121	21/21/25	12.8	Clayey SILT with Sand - black [10YR 2/1] hard moist; fine- to medium-grained sand Silty SAND - fine- to coarse-grained, dark yellowish brown [10YR 3/6], dense moist	sm		55 -	
65	W 9d60	1128	15/15/19	4.7	Sandy SILT - dark olive brown [2.5Y 5/3] hard moist; fine- to medium-grained sand.	mi		65 —	
70	W-9d65	1136	20/21/25	16.1	Silty SAND - fine- to medium-grained dark brown [10YR 3/3] dense, moist; trace amount of fine gravel Sandy SiLT with Clay - dark brown [10YR 3/3]	sm		70-	
75	W-9d70	1245	15/25/50	53.6	hard, moist; fine- to medium-grained. Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/6] very dense, moist; trace amount of fine gravel.	sm		75	
80 -1	W-9d75	1256	52	01	Silty SAND with Gravel - fine- to coarse-grained, dark olive brown [2 5Y 3/3] very dense moist; fine and coarse gravel	311		80 —	neat cement from
85 -	W-9d80	1305	-12/30/30 —	94.7	Silty SAND - fine- to medium-grained, dark olive brown [2 5Y 3/3], very dense moist; trace amount of fine gravel; trace clay.	sm		85	
90	W-9d85	1319	13/15/18	95,3	SAND - fine- to coarse-grained, olive gray [5Y 4/2] dense moist; trace fine and coarse gravel	sp		90 —	
95	W-9d90	1334	13/16/19	26,0	Silty SAND - fine- to medium-grained, light olive brown [2 5y 5/4], dense, moist; trace amount of fine gravel. Clayey SILT - olive brown [2 5Y 4/4], hard moist; trace fine- to medium-grained sand.	sm ml		95	
100	W-9d95	1352	16/18/21	7.8	Silty SAND - fine- to medium-grained, dark olive brown [2 5Y 3/3], dense, moist; trace amount of coarse gravel	sm		100	
105	W-9d100	1403	45/43/45	1.9	Sandy SILT - dark olive brown [2 5Y 3/3], very stiff moist; fine- to medium-grained sand.	m)		105	
110 -1			15/16/23	0.5	Clayey SILT with Sand - dark brown [7 5YR 3/2] hard, moist; fine- to medium-grained. Sandy SILT - dark brown [10YR 3/3] hard, moist; fine- to medium-grained sand.	mi		10 11 11 11	
	W-9d110	1425	19/23/23	38.6	Clayey Silty SAND - fine- to medium-grained dark olive brown [2 5Y 3/3], dense moist	ml	A		
Remarks/No	otes: 1) Pl	D Used:	-	!					Page 2 of 4



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Log of Boring/Well W-9

PROJECT: Sawyer Petroleum

PROJECT NO: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/18/06

FINISHED: 9/29/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of

DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	W	/ell Diagram
20 —	+ X	W 9d115 W-9d120	1508	14/16/20 38/50	25	SiLT with Clay and Sand - dark brown [10YR 3/3], hard, moist; fine- to medium-grained sand. SAND with Silt - fine- to medium-grained, gray [5Y 3/1], dense, moist. Silty SAND - fine- to medium-grained dark gray [2 5Y 4/1] dense, moist dark olive brown [2 5Y 3/3] very dense.	mi sp sm		120		
30	×	W-9d125	1518	23/25/30	51	Sandy SILT - dark olive brown [2 5Y 3/3] hard moist. Silty CLAY - dark brown [10YR 3/3] hard moist; trace fine- to medium-grained sand.	ml ci		130		
25 		W-9d130	1540	20/23/25	1.5	SILT with Clay - very dark grayish brown [10YR 3/2], hard moist; trace fine- to medium-grained sand. Sandy SILT - very dark grayish brown [2 5Y 3/2]	mi ml		135		
s 	*	W-9d135	0841	35/50	40.2	hard, moist; fine- to medium-grained sand. Sandy SiLT with Clay - dark brown [10YR 3/3] hard, moist; fine- to medium-grained sand. Silty SAND - fine- to medium-grained dark brown [10YR 3/3], very dense, moist; no recovery sample at 140 feet	ml sm		140		
	Į T	W-9d145	0927	51	73 9	Sandy SILT - dark olive brown [2 5Y 3/3], hard, moist, fine- to medium-grained sand	ml		145		
5			0953	20/20/25	0.0	SILT - very dark grayish brown [2 5Y 3/2], hard, moist; trace fine- to medium-grained sand; trace clay	mi		55 -		-bentonite chips from 152.5-157 feet
				15/19/23	-0.5	Clayey SILT - dark olive brown [2 5Y 3/3] hard moist; trace fine- to medium-grained sand.	ml		60		102.0-101 100
1 1 1 1 1				10/12/13 · · ·	0,1	SILT - very dark grayish brown [2 5Y 3/2], very stiff, moist; trace fine- to medium-grained sand; trace amount of fine gravel	ml	11	65 1		
	<u> </u>	3		20/29/20	0.7	Clayey Sandy SILT - very dark grayish brown [2.5Y 3/2] hard moist; fine- to medium-grained	mi	17	70 -		-#2/12 sand filler pac from 157-193 feet
		/ 9d170 1	1406-	13/15/20	0.0	Clayey SILT with Sand - dark olive brown [2.5Y 3/3], hard, saturated; fine- to medium-grained sand	ml		75		107-100 legt
marks	s/No	tes: 1) PIC) Used:	J		<u> </u>				F	age of 4



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Log of Boring/Well W-9

PROJECT: Sawyer Petroleum

PROJECT NO: 06 202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/18/06

FINISHED: 9/29/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

ļ				t	ime or at an	other location, there may be consequential changes in	conditions			
DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	(ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
180 —		W-9d175	1124	20/23/25	0.1	Clayey SILT - dark olive brown [2 5Y 3/3], hard saturated; trace fine- to medium-grained sand	ml		180	
185	I	W-96185		17/19/23	10.0	Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/6], dense moist	sm		185	screened (0.02 inch slot) 4 inch dla SCH 90 PVC from 160-190 5 feet
190 —	I		1146		135	Clayey SILT - brown [10YR 4/3], hard moist; trace fine- to medium-grained sand	ml		190 —	slot) 4 inch dia SCH 80 PVC from 160-190 5 feet
195		W-9d190	1154	15/19/24	137	Sandy SILT - dark clive brown [2 5Y 3/3] hard moist. Bottom at 193 feet	ml		195	
200 —							-		200 —	
205 —							į		205	
210 —									210	
215									215	
220 —									220	
225 —									225—	
230 -		a .						1	230—	
235 —								ź	35—	
Remark	(s/N	otes: 1) PtD	Used:							Bogo

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Log of Boring/Well W-10

1 of 4

PROJECT: Sawyer Petroleum SURFACE ELEVATION: Not Measured

LOCATION: 14117 AETNA ST., VAN NUYS, CA TOTAL DEPTH: 191 5 feet BORING DIAMETER: 10 inches

PROJECT NO: 06.202 DEPTH TO FIRST SATURATION: 172.5 feet

DATE BEGAN: 9/29/06 FINISHED: 10/4/06 TOP OF WELL CASING ELEVATION: N/A

DRILLING COMPANY: Water Development Corporation STATIC GW ELEVATION: DATE: N/A

time or at any other location, there may be consequential changes in conditions

DRILLING METHOD: Hollow-Stem Auger LOGGED BY; E. Kuhn CHECKED BY; D. Henry

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of

DEPTH (feet) Samples	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Diagram
5 -			: :	AIRKNIFED TO 7 FEET			5	well box encased in concrete
10 - W 10d10	0927 7 <i>f</i>	<i>F7/</i> 10	0.0	Clayey Sandy SILT - dark yellowish brown [10YR 3/4], very stiff, moist; fine- to medium-grained sand; trace amount of fine gravel Silty SAND - fine- to medium-grained dark brown [10YR 3/3], dense moist; trace amount of fine gravel	mi sm		10	
W-10d15 20			0.0	dark yellowish brown [10YR 3/4]. Clayey Silty SAND - fine- to medium-grained	sm	A	20	
25 - 1 W-10d25			0.0	dark brown [10YR 3/3], dense, moist. Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense, moist	sm		25 1 1 1	
30	0958 17/	7/18/19	02	Clayey SILT - very dark grayish brown [10YR 3/2], hard moist; trace fine- medium-grained sand; Clayey Silty SAND - fine- to medium-grained	ml sm		30 - 11 11 11	
35 W-10d35 W-10d35 W-10d35			00	dark brown [10YR 3/3] dense moist; trace amount of fine gravel. Silty SAND - fine- to medium-grained, dark brown [7 5YR 3/4], dense moist; trace amount of fine gravel. Clayey Sandy SILT - dark brown [10YR 3/3], very	mi rel		35 — 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	blank 4 inch dia. SCH
45			0.0	stiff, moist; fine- to medium-grained; trace amount of fine gravel. Silty SAND - fine- to medium-grained, dark yellowish brown [10YR 3/4] dense, moist; trace amount of fine gravel. Clayey Silty SAND - fine- to coarse-grained, dark	ml sm		1 45 11-11-11-11-11-11-11-11-11-11-11-11-11-	feet
50 — T W-10d50	1055 21/2	28/35 3	35.8	brown [10YR 3/3], dense, moist. Silty SAND - fine- to medium-grained, dark ofive brown [2 5Y 3/3], dense, moist; dark yellowish brown [10YR 3/6], very dense trace amount of fine and coarse gravel;			50 - 17	
Remarks/Notes: 1) PI	O Used:							Page



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Log of Boring/Well W-10

PROJECT: Sawyer Petroleum

PROJECT NO: 06 202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/29/06

FINISHED: 10/4/06

2 of 4

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequented changes in conditions

				time or at ar	y other location, there may be consequential changes in con-	ditions.			
DEPTH (feet) Samples	Sample I D	Time	Blow Caunts (per 6 inches)	(bbm/%)	Geologic Description	Soil Class	Graphic Log	DEРТН (feet)	Well Diagram
55 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	-10d100 -10d105 -10d110	11108 11115 1336 1352 1401 1441 1421 1438 1454	20/25/20 15/15/30 15/15/30 23/25/27 18/20/20 15/18/23 19/20/20 16/19/23	18.5 2.1 3.5 21.7 10.4 7.1 10.7	grayish brown [10YR 4/2] dense. moist; trace clay; SAND - fine- to medium-grained, grayish brown [10YR 5/2], dense, moist. Clayey SILT - olive brown [2 5Y 4/3], hard moist; trace amount of fine gravel Clayey Silty SAND - fine- to medium-grained, dark olive brown [2 5Y 3/3], dense, moist; trace amount of fine gravel. Silty SAND - fine- to medium-grained olive brown [2 5Y 4/4], dense, moist Clayey SILT with Sand - dark olive brown [2 5Y 3/3], hard, moist; fine - to medium-grained sand; trace amount of fine gravel. SAND - trace amount of fine gravel. Clayey SILT - dark olive brown [2 5Y 3/3], hard, moist; trace fine- to medium-grained; trace amount of fine gravel. Silty SAND - fine- to medium-grained, olive brown [2.5Y 4/4] dense, moist; trace amount of	E SE		55 60 65 70 75 80 85 90 95 00 05 10 10 10 10 10 10 10 10 10 10 10 10 10	neat cement from 1-151 feet
Remarks/Note	es: 1) PII) Used:							Page



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Log of Boring/Well W-10

PROJECT: Sawyer Petroleum

PROJECT NO: 06 202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/29/06

FINISHED: 10/4/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

197	DEPTH (feet)	Samples	Sample I D.	Time	Blow Counts (per 6 inches)	(bpm/%)	Geologic Description Geologic Description Geologic Description Well Diagram Well Diagram
Silty SAND - fine - to carse-grained, dark velocity brown 10 PM dense moist, trace mid mid	20 1 1 1 1 1 1 1 1 1	± ×			<u> </u>		Silty SAND - fine- to coarse-grained dark olive brown [2.5Y 3/3], very dense, moist. Clayey SILT - very dark grayish brown [2.5Y 3/2] hard, moist; trace fine- to medium-grained sand. Clayey Sandy SILT - dark olive brown [2.5Y 3/3] hard, moist; fine- to medium-grained sand; trace
Sandy SiLT - dark brown [10/78 3/3] hard moist, fine- to medium-grained sand; trace amount of fine gravel; trace clay W-10d140 1431 52 4.1 Sitty SAND with Gravel - fine- to coarse-grained. dark clive brown [2 5Y 3/3] very dense, moist, fine land coarse gravel. SAND - fine- to coarse-grained, dark clive brownish gravel; very dark of sitty brownish gravel; trace sitt; trace amount of fine gravel. SILT - dark of olive brown [2 5Y 3/3], hard moist; trace sitt; trace amount of fine gravel. W-10d166 0865 20126/28 0.3 Clayey SiltT - dark clive brown [2 5Y 3/2], hard, moist W-10d170 0907 20/23/28 0.5 Very moist trace amount of fine gravel; W-10d170 0907 20/23/28 0.5 Very moist trace amount of fine gravel;	25 —		W 10d125 -	0844	20/23/20	2.6	Silty SAND - fine- to coarse-grained, dark yellowish brown [10YR 4/6] dense moist; trace amount of fine gravel. SAND with Silt and gravel - fine- to coarse-grained, olive brown [2 5Y 4/4] dense moist; fine gravel. SILT with Clay - dark olive brown [2 5Y 3/3], hard, moist, trace fine- to medium-grained sand; trace amount of fine gravel;
dark olive brown [2 5Y 3/3] very dense, moist; fine sp and coarse gravel SAND - fine- to coarse-grained, light brownish gray [2.5Y 6/2] very dense moist; trace silt; trace amount of fine gravel; SILT - dark olive brown [2.5Y 3/3], hard moist; trace fine- to medium-grained SILT with Clay - dark olive brown [2.5Y 3/3] very dense moist; trace fine- to medium-grained SILT with Clay - dark olive brown [2.5Y 3/3] very dense moist; trace fine- to medium-grained SILT with Clay - dark olive brown [2.5Y 3/3] very dense moist; trace fine- to medium-grained SILT with Clay - dark olive brown [2.5Y 3/3], hard moist; fine dense moist; trace fine- to medium-grained, very dark grayish brown [2.5Y 3/2], hard, moist SILT with Clay - dark olive brown [2.5Y 3/2], hard, moist		*	W 10d135	1408	20/20/25	5.3	moist; fine- to medium-grained sand; trace amount
SILT with Clay - dark olive brown [2 5Y 3/3] very dense moist; trace fine- to medium-grained 150	5						dark olive brown [2 5Y 3/3] very dense, moist; fine and coarse gravel. SAND - fine- to coarse-grained, light brownish gray [2.5Y 6/2], very dense moist; trace silt; trace amount of fine gravel.
W 10d165 0812 20/25/30 1.6 Clayey Silfy SAND - fine- to medium-grained, very dark grayish brown [2.5Y 3/2], hard, moist 160 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -			V 10d150	1512	25/28/30	2.8	trace fine- to medium-grained sand 150 — SILT with Clay - dark olive brown [2 5Y 3/3] very dense moist; trace fine- to medium-grained ——bentonite chips from
Sandy SILT - dark olive brown [2 57 3/3], hard moist; fine to medium-grained sand; trace clay W-10d165 0855 20/26/28 0.3 Clayey SILT - dark olive brown [2.5Y 3/3] hard moist; W-10d170 0907 20/23/26 0.5 very moist trace amount of fine gravel;		ָר ה	V 10d165	0812	20/25/30	1.6	Clayey Silty SAND - fine- to medium-grained, sm
Clayey SILT - dark olive brown [2.5Y 3/3] hard moist; W-10d170 0907 20/23/26 0.5 Clayey SILT - dark olive brown [2.5Y 3/3] hard moist; very moist trace amount of fine gravel;		₹ v	V-10d160	0835	20/19/27 —	2.9	moist, fine to medium-grained sand; trace clay
trace fine- to medium-grained sand trace fine- to medium-grained sand trace fine- to medium-grained sand 175 -							moist;
							trace fine- to medium-grained sand #2/12 sand filter pac from 155-191 5 feet



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Log of Boring/Well W-10

PROJECT: Sawyer Petroleum

PROJECT NO.: 06.202

LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 9/29/06

FINISHED: 10/4/06

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions

L	_			•	time or at ar	ny other location, there may be consequential changes in c	onditions				
DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (%/wbd/)	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	Well Dia	gram
180 —		W-10d175	0921	23/26/27	0.2	SiLT - dark olive brown [2 5Y 3/3]. hard. moist; trace clay	ml		180		
185 —		W-10d180	1013	25/25/30	0.0	SILT with Clay - dark olive brown [2 5Y 3/3] hard moist	ml		185	scree	ned 90 02 inch
190 —		W 10d185	1038	20/23/31	0.0	Sandy SILT - dark brown [10YR 3/3] very hard moist; fine- to medium-grained sand; trace clay; trace amount of fine gravel	ml		190		ned 90.02 inch 4 inch SCH 80 from 160-190 5
	- X	W-10d190	1058	23/25/30	0.0	Bottom at 191 5 feet.	_				
195									195		
200				ļ					200		
205 —									205 —		
210 -									210		
215 —								2	215		
220 —								2	220		
225 —								2	25		
230 —								2	30		
235 —			į	3				2:	35		
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Remark	s/No	otes: 1) PIC) Used:	<u>-</u>			I I	I	一	Page	

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WAYNE PERRY, INC. 8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well SVE-4

WWW.Wpilic.com								
PRO JECT: Sawyer Petroleum	SURFACE ELEVATION: Not	Measured						
LOCATION: 14117 AETNA ST. VAN NUYS. CA	TOTAL DEPTH: 155 feet	BORING DIAMETER: 8/12						
PROJECT NO.: 06 202	DEPTH TO FIRST SATURATION	ON: N/A						
DATE BEGAN: 8/8/07 FINISHED: 8/8/07	TOP OF WELL CASING ELEVATION: N/A							
DRILLING COMPANY: Test America	STATIC GW ELEVATION:	DATE: N/A						
DRILLING METHOD: Hollow-Stem Auger	LOGGED BY: A. Dollemore	CHECKED BY: D. Henry						
	onditions at the time and place of drilling. With the tere may be consequential changes in conditions							

DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL (ppm/%)	Geologic Description	Soil Class	Graphic Log	DEРТН (feet)	Well Diagram
5						ASPHALT, 4 inches. AGGREGATE BASE, 4 inches. SILT with Sand - very dark gray [5Y 3/1] stiff moist; with fine-grained sand;	mi		25 25 25 25 25 25 25 25 26 25 26 25 26 25 26 26 26 26 26 26 26 26 26 26 26 26 26	well box encased in concrete
10 =	Į.	SVE-4d10	1330	7/8/10	1.8	color change at 10 feet to very dark greenish gray			10 111	blank 2 inch dia. SCH 40 PVC from 0 5-30 feet
15 - 11	I	SVE-4d15	1337	8/11/13	28	Sandy SILT - dark greenish gray [4/5GY] very stiff moist; with fine-grained sand;	mi		15 11 11 11 11 11 11 11 11 11 11 11 11 1	1000
20	I	SVE-4d20	1346	9/11/14	00				8	
25 —	I	SVE-4d25	1353	8/9/12	00	color change at 25 feet to brown [10YR 5/3]			25	bentonite chips from
30 -	I	SVE-4d30	1402	7/10/12	00	SILT - greenish gray [5/10Y] very stiff moist	m			
35 111	Į	SVE-4d35	1411	11/13/14	0.0	SILT with Sand - olive [5Y 4/3] very stiff moist; with fine-grained sand.	mi -		35 35 10 10 10 10 10 10 10 10 10 10 10 10 10	#2/12 sand filter pack from 29-50 5 feet
1П. 1.П. 1.П.	Ţ	SVE-4d40	1420	10/12/16	11 1	SILT - greenish gray [5/10Y], very stiff, moist; odor;	ml		4 4 hhhhhh	blank 2 inch dia. SCH 40 PVC from 0 5-55 feet
45	Ţ	SVE-4d45	1423	13/14/18	130	color change at 45 feet to clive gray [5Y 4/2];			45	screened (0 02 inch slots) 2 inch dia SCH 9 PVC from 0 5-55 feet slots) 2 inch dia SCH 40 PVC from 30-50 feet 50 5-54 feet
50 11111	I.	SVE-4d50	1438	12/12/17	31.5	Color change at 50 feet to olive [5Y 5/4] SAND - fine- to medium-grained, light olive	sp		ե 8 2 2 Հ	bentonite chips from 50 5-54 feet
14/11/17	Į.	SVE-4d55	.1445	13/15/18	.89 Z	brown [2 5Y 5/4] dense moist; solvent odor Silty SAND - fine-grained, light olive brown [2 5Y			55	
90 11-11-11-11-11-11-11-11-11-11-11-11-11-		SVE-4d60	1153	14/14/18	181.3	5/4] dense moist; solvent odor	SD		90 111111111111111111111111111111111111	#2/12 sand filler pack from 54-75 5 feet
65 H	H	SVE-4d65	1500	15/16/20	987.0	Gravelly SAND - fine- to coarse-grained, with fine and coarse gravel, light brownish gray [2 5Y 6/2], dense, moist; strong solvent odor; no Encore			65 -	
70	Щ	SVE-4d70	1508	12/14/20	203.0	Sandy SILT - light olive brown [5Y 5/4], hard moist; with fine-grained sand; solvent odor	m) 		70	screened (0 02 inch slots) 2 inch dia. SCH 40 PVC from 55-75 feet
75	¥	SVE-4d75	1518	17/20/22	181 0	Gravelly SAND - fine- to coarse-grained, with fine and coarse gravel, grayish brown [2 5Y 5/2] dense, moist; solvent odor.	sp ml		75	
80	I	SVE-4d80	1530	15/19/21	37 7	¬ SILT - light yellowish brown [2 5Y 6/4] hard moist; solvent odor Sandy SILT - light olive brown [2 5Y 5/6] hard	mi -		75 75 80 80	blank 2 inch dia. SCH 40 PVC from 0 5-130 feet
85						n moist; with fine-grained sand.	sp		85	8 222
Remar	ks/N	Notes: 1) F	PID Used:							Page 1 of 2



8281 Commonwealth Avenue Buena Park, California 90621 (714) 826-0352 www.wpinc.com

Log of Boring/Well SVE-4

PROJECT: Sawyer Petroleum

PROJECT NO: 06 202

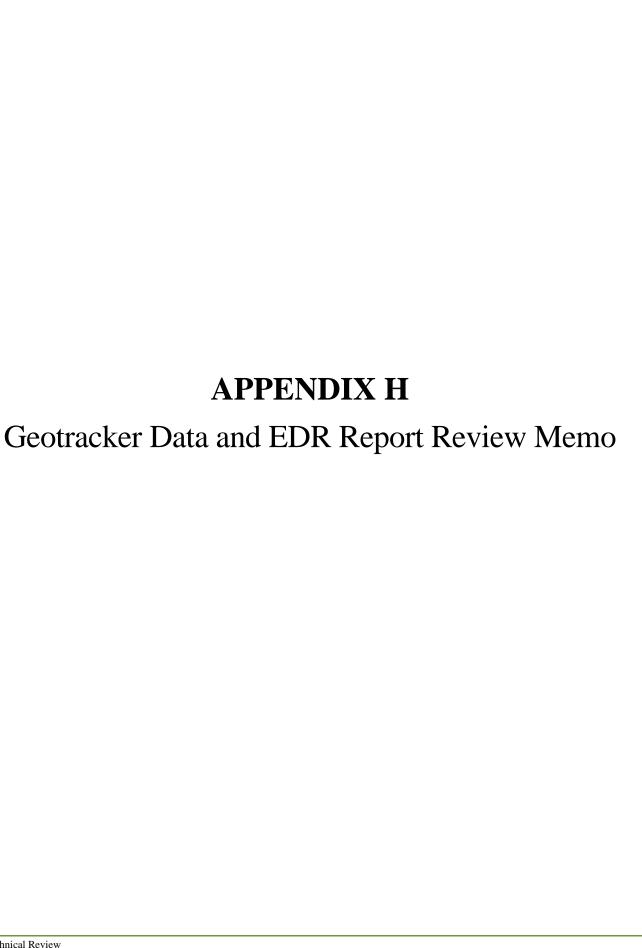
LOCATION: 14117 AETNA ST., VAN NUYS, CA

DATE BEGAN: 8/8/07

FINISHED:

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location there may be consequential changes in conditions

DEPTH (feet)	Samples	Sample I D	Time	Blow Counts (per 6 inches)	PID/LEL PID/LEL	Geologic Description	Soil Class	Graphic Log	DEPTH (feet)	We	ell Diagram
98		SVE-4d85 	1537 — — — — 1546	16/17/24 — — — — 15/18/25	41.8	SAND with Silt - fine-grained olive [5Y 5/3] dense moist; solvent odor SAND - fine-grained light gray [5Y 7/1] dense moist; solvent odor;			90		bentonite chips from 75 5-129 feet
95 -	Ţ	SVE-4d95	1555	18/19/28	97	with some silt at 95 feet			95		
100	I	SVE-4d100	1603		10 3	Silty SAND - fine-grained, olive gray [5Y 4/2] dense moist; solvent odor	 sm		100		
105						Sandy SILT - dark yellowish brown [10YR 4/4] hard, moist; with fine- to coarse-grained sand	- mi -		105		
3		SVE-4d105 _	1612	15/20/25	28	SILT with Clay - olive [5Y 5/3] hard moist;	mi		110		
110		SVE-4d110	1620	14/20/20	07						
115		SVE-4d115	1629	21/20/23	00	color change at 115 feet to light olive brown [2 5Y 5/4] trace fine-grained sand;			115		
120 -	I	SVE-4d120	1637	13/17/20		no recovery at 120 feet			120		
125	I	SVE-4d125	1647	12/16/19	17	SILT - olive [5Y 4/4] hard moist;	mi		125		
130	Į	SVE-4d130	1700	15/16/20	21	iron oxide mottling at 130 feet	 		130		
135	I	SVE-4d135	1708	13/16/23	00	Sandy SILT - olive [5Y 4/4], hard moist; with fine- to medium-grained sand	""		135		-#2/12 sand filler pack from 129-155 feet
140	Ţ	SVE-4d140	———— 1715	11/12/17	08	SAND with Gravel - fine- to coarse-grained pale of ve [5Y 6/3], medium dense moist; with fine and	sp		140		
145	I	SVE-4d145	1723	 14/15/16	37	coarse gravel. SILT - olive [5Y 5/3] hard moist: trace fine-grained sand	m		145		-screened (0 02 inch siots) 2 inch dia, SCH 40 PVC from 130-155
150	I.	\$VE-4d150	1731	15/17/20	28				150		feet
155	I	SVE-4d155	1740	14/15/15	31	Bottom at 155 feet	<u> </u>		155		
160						Bollon at 100 leet			160		
165									165 —		
	ŀ								1411		
170 —									170 — 3		
175									175		
180									180		
-											
Remark	ks/N	otes: 1) P	ID Used:				-	•		Į.	Page of 2
										2	of 2



MUGENKIOKU CORPORATION 述法

TO: Curtis Fang

FROM: Matt Grooms

SUBJECT: Metro TO5 - Hazard and Hazardous Waste Research Task

DATE: October 8, 2020

MugenKioku was tasked with reviewing GeoTracker data to determine if there were active GeoTracker sites near the proposed drywell locations or within the project drainage area. MugenKioku was also tasked with reviewing EDR reports to determine if additional pollutant sources not mentioned within GeoTracker could potentially affect the proposed drywell locations or project drainage area.

Based on analysis of GeoTracker data, there are two active GeoTracker sites near proposed drywell locations and zero active GeoTracker sites within the project drainage areas. Table 1 contains a summary of each of the two active GeoTracker sites. Table 2 compares the most recent groundwater sampling results for both GeoTracker ID SL1842891411 and GeoTracker ID T0603702406 to the California's maximum contaminant levels (MCLs) for drinking water. Figure 1 contains a map of the drainage areas, proposed drywell locations, and active GeoTracker sites.

The following provides a brief summary of each of the three active GeoTracker sites. Additional information can be found within Table 1.

- GeoTracker ID SL184281411 is located approximately 0.22 miles southeast of MOL-1, and the potential contaminants of concern are volatile organic compounds (VOCs). Attachment A contains the Groundwater and Soil Vapor Extraction System Operation, Maintenance, and Monitoring Report, prepared by Geosyntec during the second quarter of 2020. This report provides the most recent sampling results and groundwater data.
- GeoTracker ID T0603702406 is located approximately 0.10 miles west of MOL-4, and the
 potential contaminants of concern are "Other Solvent/Non-Petroleum Hydrocarbons".
 Attachment B contains the Groundwater Monitoring, and Status Report, prepared by Wayne
 Perry during the second quarter of 2020. This attachment provides the most recent sampling
 and groundwater data.

After reviewing the EDR reports is was determined that no additional active contaminant remediation sites and potential groundwater pollutants were found near the proposed drywell locations or project drainage area. The EDR Reports are included within Attachment C and Attachment D.

Due to file upload size limit, Attachment A through D are not attached as part of the safe clean water program application. These attachments can be provided as electronic copies upon request.

TABLE 1. SUMMARY OF ACTIVE SITES

GeoTracker ID	Address	Status	Potential Contaminants of Concern	Distance from Drywell Location	Located within Drainage Area	Depth to Groundwater	Groundwater Flow Direction
SL184281411	14837 Califa St. Van Nuys, CA 91411	Open - Remediation as of 5/20/2019	Volatile Organic Compounds	0.22 Miles Southeast of MOL-1	No	137.01-176.96 feet (05/26/2020)	Towards the Northeast, with an average gradient of approximately 0.0019 feet per foot (ft/ft) (05/26/2020)
T0603702406	14117 Aetna St. Van Nuys, CA 91401	Open - Remediation as of 2/2/2011	Other Solvent or Non-Petroleum Hydrocarbon	0.10 Miles West of MOL-4	No	169.16-176.96 feet (04/01/2020)	Southeast flow direction, gradient of 0.033 per foot (ft/ft (04/01/2020)

TABLE 2. GROUNDWATER DATA

		-8-	e, d		, T.			E.F.		y	41	Concer	tration (ug	/L)								3 2 2	3 - 1
GeoTracker ID	Sample ID	Acetone	Dibromochloromethane	1,1,1-Trichloroethane	Toluene	1,4-Dioxane	Perchlorate	Hexavalent	C4-C12	C10-C28	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	Benzene	Chloroform	cis-1,2-Dichloroethene	Di-isopropyl ether (DIPE)	Methyl-tert-butyl Ether (MTBI	tert-Butanol (TBA)	Tetrachloroethene (PCE)	trans-1,2-Dichloroethene	Trichloroethene
	MCL		80	5	100	1	6	50	- 4	-	5	5	6	0.5	1	80	6		13	- 4-	5	10	5
	MW1-R	< 20	< 2.0	< 1.0	< 1.0	n/a	n/a	n/a	n/a	n/a	< 1.0	n/a	< 1.0	n/a	n/a	4.4	n/a	n/a	n/a	n/a	< 1.0	n/a	91
-	MW3-R												Well ha	s been dry	since 10/20	16							
41	MW4	0.0	Well has been dry since 10/2016 < 20 < 2.0 < 1.0 < 1.0 n/a n/a n/a n/a n/a < 1.0 n/a < 1.0 n/a n/a 5.7 n/a n/a n/a n/a < 1.0 n/a 180																				
511842891411	MW5	< 20	< 2.0	< 1.0	< 1.0	n/a	n/a	n/a	n/a	n/a	< 1.0	n/a	< 1.0	n/a	n/a	5.7	n/a	n/a	n/a	n/a	< 1.0	n/a	180
742	MW8	< 20	< 2.0	< 1.0	< 1.0	n/a	n/a	n/a	n/a	n/a	< 1.0	n/a	< 1.0	n/a	n/a	< 1.0	n/a	n/a	n/a	n/a	< 1.0	n/a	< 1.0
Ë	MW9	< 20	< 2.0	< 1.0	< 1.0	n/a	n/a	n/a	n/a	n/a	< 1.0	n/a	< 1.0	n/a	n/a	< 1.0	n/a	n/a	n/a	n/a	< 1.0	n/a	< 1.0
S	MW10	< 20	< 2.0	< 1.0	< 1.0	n/a	n/a	n/a	n/a	n/a	< 1.0	n/a	< 1.0	n/a	n/a	< 1.0	n/a	n/a	n/a	n/a	1.5	n/a	< 1.0
	MW10 DUP	< 20	< 2.0	< 1.0	< 1.0	n/a	n/a	n/a	n/a	n/a	< 1.0	n/a	< 1.0	n/a	n/a	< 1.0	n/a	n/a	n/a	n/a	1.4	n/a	< 1.0
	MW-5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	550	47	ND < 2.5	ND < 2.5	ND < 2.5	ND < 2.5	ND < 2.5	10	ND < 2.5	ND < 2.5	ND < 2.5	ND < 50	150	ND < 2.5	320
	MW-6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1200	ND < 48	5.7	9.6	0.98	57	9.5	48	25	10	ND < 0.50	ND < 10	460	2.6	990
	W-10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	970	ND < 47	ND < 5.0	ND < 5.0	ND < 5.0	66	9.4	31	ND < 5.0	6.8	ND < 5.0	ND < 100	280	ND < 5.0	690
	MW-4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ND < 50	510	ND < 0.50	ND < 0.50	ND < 0.50	ND < 0.50	ND < 0.50	0.61	1.9	ND < 0.50	ND < 5.0	ND < 10	16	ND < 0.50	14
	W-9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	360	ND < 48	ND < 2.5	ND < 2.5	ND < 2.5	13	ND < 2.5	10	ND < 2.5	3.6	ND < 2.5	ND < 50	110	ND < 2.5	220
9	W-8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	210	ND < 48	ND < 0.50	3.4	ND < 0.50	5.3	ND < 0.50	5	1.2	47	1.6	ND < 10	75	ND < 0.50	76
T0603702406	W-6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ND < 50	4500	ND < 0.50	0.51	ND < 0.50	0.84	ND < 0.50	1.3	1.2	1.2	ND < 0.50	ND < 10	4.4	ND < 0.50	4.9
03.7	MW-7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1200	ND < 47	ND < 5.0	ND < 5.0	ND < 5.0	ND < 5.0	ND < 5.0	27	7.2	ND < 5.0	ND < 5.0	ND < 100	310	ND < 5.0	740
99	W-7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7500	ND < 48	ND < 50	ND < 50	ND < 50	86	ND < 50	ND < 50	89	ND < 50	6600	ND < 1000	ND < 50	ND < 50	ND <
-	W-1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	300	ND < 48	ND < 0.50	6.8	ND < 0.50	5.8	ND < 0.50	12	2.8	41	1	ND < 10	93	ND < 0.50	94
	W-2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	600	ND < 48	ND < 1.0	7.4	ND < 1.0	47	ND < 1.0	13	2.1	45	220	20	120	ND < 1.0	140
	W-5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12000	61	ND < 100	ND < 100	ND < 100	150	ND < 100	ND < 100	ND < 100	140	9800	ND < 2000	ND < 100	ND < 100	160
	W-3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2200	ND < 48	ND < 13	14	ND < 13	57	ND < 13	ND < 13	49	46	1600	ND < 250	110	ND < 13	140
	W-4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3000	ND < 48	ND < 10	13	ND < 10	190	ND < 10	ND < 10	120	49	2600	ND < 200	120	ND < 10	85

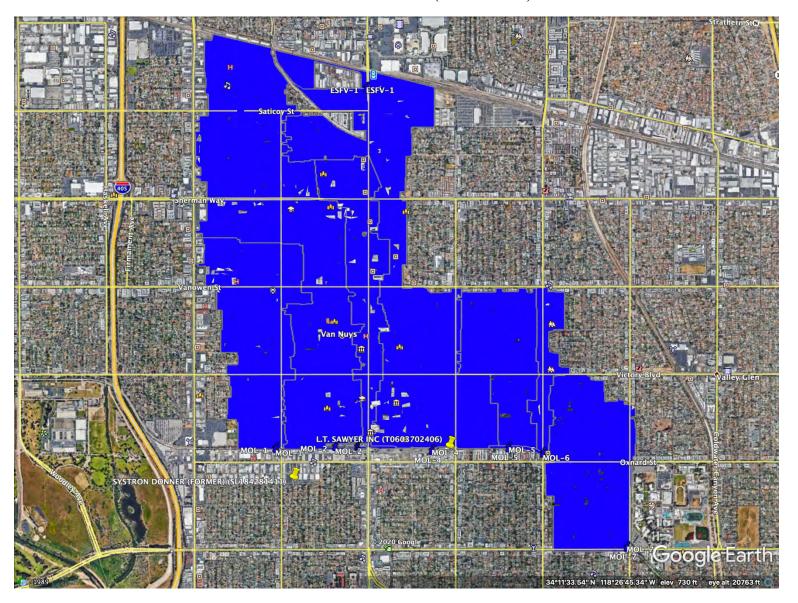
The federal MCL is shown unless there is no federal MCL for that analyte or the California MCL is lower than the federal MCL

Yellow highlight indicates a value that exceeded the MCL.

ND = Non-detect; n/a = not applicable

- -- = MCL value not provided
- -- = contaminant has no establisehd federal/California MCL

FIGURE 1. DRAINAGE AREAS, PROPOSED DRYWELL LOCATIONS, AND ACTIVE GEOTRACKER SITES (YELLOW PINS)







engineers | scientists | innovators

Existing Hydrology and Water Quality Condition

Metro Orange Line Water Infiltration and Quality Project

1. INTRODUCTION

As part of the Safe Clean Water Program Feasibility Study for the Metro Orange Line Water Infiltration and Quality Project ("Project"), this attachment documents the methodology and modeling results that characterizes the existing hydrology and water quality condition. The modeling work was performed using Los Angeles County's Watershed Management System 2.0 (WMMS 2.0). Detailed model development methodology is presented below.

2. MODEL DEVELOPMENT

WMMS 2.0 is the latest watershed modeling system developed by the Los Angeles Flood Control District. It is released to the public in May 2020. WMMS 2.0 is a thorough upgrade to WMMS 1.0 that was previously released in August 2013. In comparison to the previous version, WMMS 2.0 is calibrated based on hydrology and water quality monitoring data collected up to 2018 and can therefore more accurately simulate contaminant loading, runoff volume, and flow rate associated with various design storms and long-term simulation for all major watershed within Los Angeles County. WMMS 2.0 contains two major components: a Loading Simulation Program in C++ (LSPC), which is a watershed modelling system to simulate runoff and pollutant loading; and a System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN), which utilizes LSPC model output and evaluates BMP performance in terms of pollutant load reduction and runoff volume reduction.

The hydrologic analysis included the development of a 10-year continuous simulation model between 10/1/2008 and 9/30/2018. Although the September 2019 Feasibility Study Guidelines state that a minimum of 20-years should be used for the annual average calculations, LA County staff have since requested that the modeling period match that of the online module which is 10/1/2008 - 09/30/2018

For the WMMS 2.0 model, the baseline LSPC model was modified by editing the subwatershed boundary and hydrologic response unit (HRU) parameters to simulate dry and wet weather runoff from the Project drainage areas ¹. The hydrologic response unit (HRU) within the revised subwaterhsed boundary was updated accordingly using the HRU raster downloaded from WMMS 2.0 website. It is assumed that the baseline LSPC model has been calibrated by LACFCD to reflect the hydrologic condition within each watershed in Los Angeles County. Default parameters were used unless site-specific modification was required (e.g. subwatershed boundary).

Hydrology Review and Water Quality Condition

¹ Model input was developed and executed using LSPC v6.0 provided in the WMMS 2.0 application package

3. ASSUMPTIONS AND APPROACH

The WMMS 2.0 input parameters assumed for each scenario included:

- **Precipitation and Model Run Time:** Taken directly from the baseline WMMS 2.0 database, the default rain gauges assigned to LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861 and model run time (10/1/2008 09/30/2018) were used for the simulation to be consistent with the recommended modeling period specified in the SCW online module. The 10-year hyetographs for the selected rain gauges are shown in Figure 1.
- **Dry-weather Runoff Estimate:** The LSPC model simulation estimated the dry weather runoff as a function of irrigated pervious HRU. This was updated for the updated Project drainage area described in previous attachment.
- Soils: Taken directly from the baseline WMMS model, the default WMMS soil parameters adopted from LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861 were used in the simulation.

4. **RESULTS**

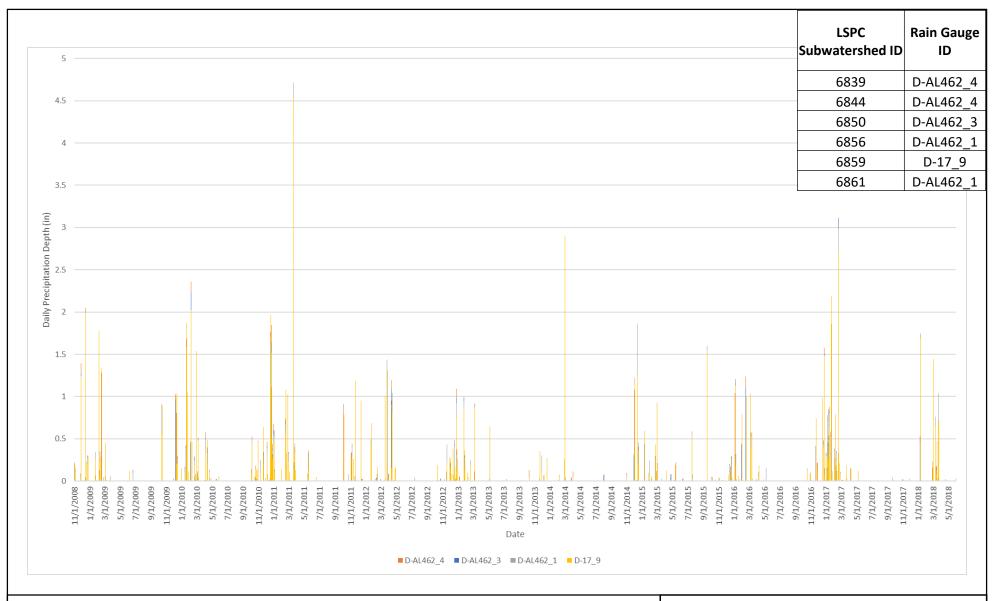
Table 1 summarizes the existing pollutant loading and runoff volume under the existing condition (e.g. without proposed Project) from the 10-year long term simulation. This section summarizes the modeling output. All model input and output files are provided in Appendix A.

Table 1. Average Annual Hydrology and Water Quality Summary of the Existing Condition

Metric	Dry Weather	Wet Weather				
Average Inflow Rate (cfs)	0.1	98.4				
Runoff Volume (ac-ft)	17	1410				
Total Zinc (ug/L)	244					
Total Zinc (lbs)	898					
Total Copper (ug/L)	59					
Total Copper (lbs)	218					
Total Lead (ug/L)	32					
Total Lead (lbs)	117					
Total Nitrogen (mg/L)	1.4					
Total Nitrogen (lbs)	5290)				
Total Phosphorous (mg/L)	0.2					
Total Phosphorous (lbs)	844	·				

2

FIGURES



10-Year Hyetograph

Metro Orange Line Water Infiltration and Quality Project –
Existing Hydrology and Water Quality Condition
Los Angeles, CA

Geosyntec [▶]
concultonto

Figure

1

consultants

Los Angeles October 2020

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APPENDIX A WMMS 2.0 LSPC Model Input

*Output not included as it contains 10,000+ lines of times series output. Output can be provided as electronic copy upon request.

LSPC Model – Existing Condition

```
c LSPC -- Loading Simulation Program, C++
c Version 6.0 (64-bit) - Jan 2020
c Created through code updates by:
c Paradigm Environmental, Inc.
c San Diego, California, USA
c www.paradigmh2o.com
c Based upon LSPC version 5.0 (Mar 2018), originally developed by :
c United States Environmental Protection Agency
c with support by Tetra Tech, Inc.
c https://github.com/USEPA/LSPC-Loading-Simulation-Program
c NOTE: The line starting with the letter c and followed by space or - is a comment line.
   There must be no comment line in between the data lines
C
       The input text field must be a continuous string without any space in between the characters
C-
c LSPC MODEL INPUT FILE
c This input file was created at 10:54:42pm on 09/10/2020
C-----
c0
    general control
C
    snowfg
            if = 1 run snow module
            if = 1 run pwater
   pwatfg
C
            if = 1 run sediment
C
    sedfa
           if = 1 run general quality
   pqalfg
   tempfg if = 1 run temperature module
С
             if = 1 run DO-BOD module
С
    oxfg
           if = 1 run nutrients module
  nutfg
C
  plkfg if = 1 run plank module
   phfg if = 1 run pH-CO2 module
C
c snowfg pwatfg sedfg pqalfg tempfg oxfg nutfg plkfg phfg 0 1 1 1 0 0 0 0 0
     _____
c10 weather file definition (name and parameters)
    wfileid
               weather file id
C
    wfilename weather file name
С
    wparamnum number of parameters in the weather file
    wparamid weather paramter id
С
               1-precipitation (in/ivl)
               2-potential evaporation (in/ivl)
С
               3-air temperature (degree F)
               4-wind speed (mile/ivl)
С
С
               5-solar radiation (ly/ivl)
               6-dew point (degree F)
C
С
               7-cloud cover (tenth)
c wfileid wfilename wparamnum wparamid...
       1792 D-AL462_4.pre 1 1
            D-AL462_1.pre 1
D-AL464_2.pre 1
       1794
       1795
            P-AL464_2.pre 1
       1797
            P-AL462_1.pre 1
       1855
             D-17_9.pre
            D-AL462_3.pre 1
       1857
       2076 x53y74.air 1
c15 weather station definition (station id and associated weather files)
C
C
    wstationid weather station id
    wfilenum number of files for the weather station wfileid weather file id (card 10)
С
              weather file id (card 10)
    wfileid
C
С
   wstationid wfilenum wfileid...
C
                 1792
       792
            2
                            2076
       794
             2
                    1794
                            2076
                    1795
       795
            2
                            2076
       796
              2
                     1796
                            2076
           2
                    1797
       797
                            2076
       855 2
                   1855
                            2076
       857
                     1857
                            2076
```

```
c20 weather parameter multiplier
С
     wstationid weather station id (card 15)
      wparmmult multiplier for each weather parameter
С
         1- multiplier for precipitation
C
С
         2- multiplier for potential evapotranspiration
         3- multiplier for air temperature
С
        4- multiplier for wind speed
C
        5- multiplier for solar radiation
         6- multiplier for dew point
С
         7- multiplier for cloud cover
С
c wstationid wparmmult1...
        792
                 1.000000
                                  1.000000
        794
                1.000000
                                 1.000000

      794
      1.000000
      1.000000

      795
      1.000000
      1.000000

      796
      1.000000
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      797
      1.000000
      1.000000

      855
      1.000000
      1.000000

      857
      1.000000
      1.000000

c----c30 output file path input (weather) file path (each must be a continuous string)
    C-----
c40 general watershed controls
C
C
   nsubbasin number of subwatersheds
                  number of stream channels (corresponds with number of subwatersheds)
C
   nrgid
                  number of stream groups to assign parameters
C
  ndefid number of land groups to assign parameters ndeluid maximum number of land use
C
С
c nsws nrch nrgroup
      s nrch nrgroup nlgroup n
12 12 2 2 96
                                           nlandp
c45 general output controls
                   Output standard model parameters
C
     Standard
С
     Snow
                   Output snow related parameters
    Hydrology Output hydrology related parameters
C
С
    Sediment Output sediment related parameters
C
                   Output general water quality related parameters
    GQUAL Output general water quality related parameters

RQUAL Output biochemical water quality related parameters

Custom Output user specified parameters
C
     Landuse Output landuse summary
C
C
                   if = 0 no output
                   if = 1 average annual output
C
                    if = 2 yearly output
С
С
                    if = 3 monthly output
                  Output stream summary
С
     Stream
                   if = 0 no output
                    if = 1 average annual output
C
                    if = 2 yearly output
С
                    if = 3 monthly output
C
С
     PointSource Output point source summary
                    if = 0 no output
C
С
                    if = 1 average annual output
                    if = 2 yearly output
                    if = 3 monthly output
C
     Threshold Output threshold analysis summary
                   if = 0 no output
C
                    if = 1 average monthly output
С
С
     SUSTAIN
                  Output unit-area land timeseries for SUSTAIN external option
                    if = 0 no output
С
                    if = 1 timeseries output
C
c Standard Snow Hydrology Sediment GQUAL RQUAL Custom Landuse Stream PointSource Threshold SUSTAIN
    C------
c46 user specified output parameter list
C
c PRECP AIRTMP SNOTMP SNOWF RAINF PRAIN MELT SNOWE WYIELD PACK PACKF PACKW PACKI
COVINDX NEGHTS XLNMELT RDENPKF SKYCLEAR SNOCOV DULLNESS ALBEDO PAKTEMP DEWTMP SURS
UZS LZS AGWS SURO IFWO AGWO PERO TAET PERC INFIL GWI IGWI AGWI DEP
AVDEP HRAD AVVEL SAREA VOLUME RO TAU WSSD SCRSD SOSED SOBER SSEDC LSSED LRSED LBEDDEP
LDEPSCR LROSED SQO WASHQS SCRQS SOQO POQUAL SOQUAL IOQUAL GOQUAL POQC CONC CONCOUT

CONCSQAL MATSQAL MATIN MATOUT MATOSQAL DOX DOXMIN DOXMAX DOXAV DOXX BOD BODX NO3 NO3X

TAM TAMX NO2 NO2X PO4 PO4X SNH4 SNH4X SPO4 SPO4X PHYTO PHYTOX PHYCLA BENAL ORN

ORNX ORP ORPX ORC ORCX NOX DIN TN TP PH ALK TIC TICX CO2 CO2X TEMP
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C-----
c50 model simulation time period
С
      mstart model start day.
C
      mend model end day.
С
                  time step in minutes.
C
     deltm
     mostart model output start day.
C
c moend model output end day.
     optlevel if = 1 general output (daily)
C
                    if = 2 output per hour (hourly)
C
                    if = 3 output per time interval (minute)
C
C
  c mstart mend
                                                                                10/1/2018
                                                60 10/1/2008
C------
c60 group information
С
     subbasin subbasin id
C
c defid group parameter id
                   number of weather stations assigned to the watershed
C
      wsti = station id
C
      wti = weighting to calculate input
С
c subbasin defid nwst wst1 wt1 wst2 wt2 ...
                                    792 1.000000
                          1
1
          6665 40
          6671
                    33
                                        794 1.000000

    6671
    33
    1
    794
    1.000000

    6673
    33
    1
    857
    1.000000

    6674
    33
    1
    795
    1.000000

    6675
    33
    1
    795
    1.000000

    6684
    40
    1
    797
    1.000000

    6839
    33
    1
    792
    1.000000

    6850
    33
    1
    857
    1.000000

    6856
    40
    1
    794
    1.000000

    6859
    33
    1
    855
    1.000000

    6861
    40
    1
    794
    1.000000

C-----
c70 modeled land use names
C
С
      deluid
                     landuse id
      deluname landuse name premult multiplier fo
С
                    multiplier for precipitation
C
      petmult multiplier for potential evapotranspiration
C
c deluid deluname premult petmult
          1000 Road_Freeway-All-All-All 1.000000 0.300000
2000 Road_Primary-All-All-All 1.000000 0.300000
          2000
          3000
                   Road_Minor-All-All-All 1.000000 0.300000
          4000 Dev_ResHigh-All-All 1.000000 0.300000
          5000 Dev_ResLow-All-All 1.000000 0.300000
          6000
                   Dev_Com_All_All 1.000000 0.300000

Dev_Ind_All_All_All 1.000000 0.300000

Dev_Inst_All_All_All 1.000000 0.300000

Dev_Roof_All_All_All 1.000000 0.300000
          7000
          8000
          9000
          10000 Dev_Overspray-All-All-All 1.000000 0.300000 11111 Dev_Irrigated-A-Low-Confined 1.000000 0.500000
          11112 Dev_Irrigated-A-Low-Unconfined 1.000000 0.500000
          11121
                   Dev_Irrigated-A-Med-Confined 1.000000 0.500000
                   Dev_Irrigated-A-Med-Unconfined 1.000000 0.500000
          11122
          11211
                   Dev_Irrigated-B-Low-Confined 1.000000 0.500000
          11212 Dev_Irrigated-B-Low-Unconfined 1.000000 0.500000
                    Dev_Irrigated-B-Med-Confined 1.000000 0.500000
          11221
                   Dev_Irrigated-B-Med-Unconfined 1.000000 0.500000
          11222
          11311 Dev_Irrigated-C-Low-Confined 1.000000 0.500000
          11312 Dev_Irrigated-C-Low-Unconfined 1.000000 0.500000
                   Dev_Irrigated-C-Med-Confined 1.000000 0.500000
          11321
          11322 Dev_Irrigated-C-Med-Unconfined 1.000000 0.500000
          11411 Dev_Irrigated-D-Low-Confined 1.000000 0.500000
          11412
                   Dev_Irrigated-D-Low-Unconfined 1.000000 0.500000
          11421
                   Dev_Irrigated-D-Med-Confined 1.000000 0.500000
          11422 Dev_Irrigated-D-Med-Unconfined 1.000000 0.500000
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12111
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   12112
          Dev_Pervious-A-Low-Unconfined 1.000000
                                                       0.500000
   12121
           Dev_Pervious-A-Med-Confined
                                       1.000000
                                                       0.500000
   12122
          Dev_Pervious-A-Med-Unconfined 1.000000
                                                       0.500000
   12211
           Dev_Pervious-B-Low-Confined
                                                       0.500000
   12212
          Dev_Pervious-B-Low-Unconfined 1.000000
                                                       0.500000
   12221
           Dev_Pervious-B-Med-Confined
                                        1.000000
                                                       0.500000
   12222
          Dev Pervious-B-Med-Unconfined 1.000000
                                                       0.500000
   12311
          Dev_Pervious-C-Low-Confined
                                       1.000000
                                                       0.500000
   12312
           Dev_Pervious-C-Low-Unconfined 1.000000
                                                       0.500000
   12321
          Dev_Pervious-C-Med-Confined
                                        1.000000
                                                       0.500000
          Dev_Pervious-C-Med-Unconfined 1.000000
   12322
                                                       0.500000
   12411
          Dev_Pervious-D-Low-Confined
                                        1.000000
                                                       0.500000
   12412
           Dev_Pervious-D-Low-Unconfined 1.000000
                                                       0.500000
   12421
          Dev Pervious-D-Med-Confined
                                       1.000000
                                                       0.500000
   12422
          Dev_Pervious-D-Med-Unconfined 1.000000
                                                       0.500000
   13111
           Agriculture-A-Low-Confined
                                        1.000000
                                                       1.000000
          Agriculture-A-Low-Unconfined 1.000000
   13112
                                                       1.000000
   13121
           Agriculture-A-Med-Confined
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                                                       1.000000
   13122
          Agriculture-A-Med-Unconfined 1.000000
                                                       1.000000
    13211
           Agriculture-B-Low-Confined
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                                                       1.000000
   13212
          Agriculture-B-Low-Unconfined 1.000000
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   13221
          Agriculture-B-Med-Confined
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                                                       1.000000
   13222
          Agriculture-B-Med-Unconfined 1.000000
                                                       1.000000
   13231
          Agriculture-B-High-Confined
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                                                       1.000000
   13232
          Agriculture-B-High-Unconfined 1.000000
                                                       1.000000
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          Agriculture-C-Low-Confined
                                        1.000000
   13312
           Agriculture-C-Low-Unconfined 1.000000
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   13321
          Agriculture-C-Med-Confined
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                                        1.000000
          Agriculture-C-Med-Unconfined 1.000000
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   13322
           Agriculture-C-High-Confined
   13331
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   13411
           Agriculture-D-Low-Confined
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   13412
          Agriculture-D-Low-Unconfined 1.000000
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   13421
          Agriculture-D-Med-Confined
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    13422
           Agriculture-D-Med-Unconfined 1.000000
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          Agriculture-D-High-Confined
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   13431
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   13432
           Agriculture-D-High-Unconfined 1.000000
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           Veg_Low-A-Med-Confined 1.000000
                                              1.000000
   14122
           Veg_Low-A-Med-Unconfined
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   14131
           Veg_Low-A-High-Confined
                                        1.000000
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          Veg_Low-A-High-Unconfined
   14221
           Veg_Low-B-Med-Confined 1.000000
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           Veg_Low-B-Med-Unconfined
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   14222
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           Veg_Low-B-High-Confined
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   14232
           Veg_Low-B-High-Unconfined
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   14321
           Veg_Low-C-Med-Confined 1.000000
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   14322
           Veg_Low-C-Med-Unconfined
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           Veg_Low-C-High-Confined
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           Veg_Low-C-High-Unconfined
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   14421
           Veg_Low-D-Med-Confined 1.000000
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           Veg_Low-D-Med-Unconfined
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           Veg_Low-D-High-Confined
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           Veg_Low-D-High-Unconfined
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   15121
           Veg High-A-Med-Confined
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          Veg_High-A-Med-Unconfined
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   15131
           Veg_High-A-High-Confined
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   15132
           Veg_High-A-High-Unconfined
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           Veg_High-B-Med-Confined
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           Veg_High-B-High-Confined
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          Veg High-B-High-Unconfined
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           Veg_High-C-High-Confined
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           Veg_High-C-High-Unconfined
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           Veg_High-D-Med-Confined
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           Veg_High-D-Med-Unconfined
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           Veg_High-D-High-Confined
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   15432
          Veg_High-D-High-Unconfined
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   16000 Water-All-All 1.000000 1.000000
          _____
land use to stream routing
 defid
             landuse default group id
 deluid
            land use id
 route_suro fraction of surface runoff that routes to the stream (0-1) (default=1)
             if negative (<0) value then that fraction will be lost from the system
 route_ifwo fraction of interflow outflow that routes to the stream (0-1) (default=1)
             if negative (<0) value then that fraction will be lost from the system
```

c80

C

C

C C

С

```
route_agwo fraction of groundwater outflow that routes to the stream (0-1) (default=1)
C
                 if negative (<0) value then that fraction will be lost from the system
С
С
     Example: 0.3 means 30% of outflow routes to the stream and 70% bypasses to the next down stream in the
С
reach network
С
             -0.3 means 30% of outflow is permanently lost from the system and 70% routes to the stream
              Enter a value of -1 to permanently lose all water from the respective layer
С
              This convention applies to all three parameters (route_suro, route_ifwo, and route_agwo)
С
С
   defid deluid route_suro route_ifwo route_agwo
                                                      -1.000000
       33
               1000
                       1.000000
                                      1.000000
               2000
                       1.000000
                                      1.000000
                                                      -1.000000
               3000
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                                      1.000000
                                                      -1.000000
       33
               4000
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               13421
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                                      1.000000
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33	14231	1.000000	1.000000	-0.500000
33	14232	1.000000	1.000000	-0.500000
33	14321	1.000000	1.000000	-0.500000
33	14322	1.000000	1.000000	-0.500000
33	14331	1.000000	1.000000	-0.500000
33	14332	1.000000	1.000000	-0.500000
33	14421	1.000000	1.000000	-0.500000
33	14422	1.000000	1.000000	-0.500000
33	14431	1.000000	1.000000	-0.500000
33	14432	1.000000	1.000000	-0.500000
33	15121	1.000000	1.000000	-0.500000
33	15122	1.000000	1.000000	-0.500000
33	15131	1.000000	1.000000	-0.500000
33	15132	1.000000	1.000000	-0.500000
33	15221	1.000000	1.000000	-0.500000
33	15222	1.000000	1.000000	-0.500000
33	15231	1.000000	1.000000	-0.500000
33	15232	1.000000	1.000000	-0.500000
33	15321	1.000000	1.000000	-0.500000
33	15322	1.000000	1.000000	-0.500000
33	15331	1.000000	1.000000	-0.500000
33	15332	1.000000	1.000000	-0.500000
33	15421	1.000000	1.000000	-0.500000
33	15422	1.000000	1.000000	-0.500000
33	15431	1.000000	1.000000	-0.500000
33	15432	1.000000	1.000000	-0.500000
33	16000	1.000000	1.000000	-0.500000
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40	2000		-0.900000	-1.000000
40		-0.400000 -0.400000	-0.900000	-1.000000
	3000			
40	4000	-0.400000	-0.900000	-1.000000
40	5000	-0.400000	-0.900000	-1.00000
40	6000	-0.400000	-0.900000	-1.000000
40	7000	-0.400000	-0.900000	-1.000000
40	8000	-0.400000	-0.900000	-1.000000
40	9000	-0.400000	-0.900000	-1.000000
40	10000	-0.400000	-0.900000	-1.000000
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40	11112	-0.400000	-0.900000	-0.900000
40	11121	-0.400000	-0.900000	-0.900000
40	11122	-0.400000	-0.900000	-0.900000
40	11211	-0.400000	-0.900000	-0.900000
40	11212	-0.400000	-0.900000	-0.900000
		-0.400000		
40	11221		-0.900000	-0.900000
40	11222	-0.400000	-0.900000	-0.900000
40	11311	-0.400000	-0.900000	-0.900000
40	11312	-0.400000	-0.900000	-0.90000
40	11321	-0.400000	-0.900000	-0.900000
40	11322	-0.400000	-0.900000	-0.900000
40	11411	-0.400000	-0.900000	-0.900000
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40	11421	-0.400000	-0.90000	-0.900000
40	11422	-0.400000	-0.900000	-0.900000
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40	12112	-0.400000	-0.900000	-0.900000
40	12121	-0.400000	-0.900000	-0.900000
40	12122	-0.400000	-0.900000	-0.900000
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40	12311	-0.400000	-0.900000	-0.900000
40	12312	-0.400000	-0.900000	-0.900000
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40	13112	-0.400000	-0.500000	-0.800000
40	13121	-0.400000	-0.500000	-0.800000
40	13122	-0.400000	-0.500000	-0.800000
40	13211	-0.400000	-0.500000	-0.800000
40	13212	-0.400000	-0.500000	-0.800000
40	13221	-0.400000	-0.500000	-0.800000
40	13222	-0.400000	-0.500000	-0.800000
40	13231	-0.400000	-0.500000	-0.800000
40	13232	-0.400000	-0.500000	-0.800000
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14422 -0.400000
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15221 -0.400000
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-0.500000
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                      -0.400000
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       40
               16000 -0.400000
                                      -0.500000
                                                      -0.800000
c90 land use information
     subbasin
                subbasin id
     deluid
                land use id
                land use name
    deluname
    perimp 1 imperivous land (subsurface processes disabled)
                2 pervious land (subsurface processes activated)
     area_ac
                area (acres)
     slsur
               slope of overland flow plane (none)
    lsur
                length of overland flow plane (feet)
  subbasin deluid deluname perimp area_ac slsur lsur
       6665 1000 Road_Freeway-All-All-All 1 0.000000 0.010000 100.0000000 6665 2000 Road_Primary-All-All-All 1 8.985516 0.010000 100.0000000
                     Road_Primary-All-All-All
Road_Minor-All-All-All 1
Dev_ResHigh-All-All-All
                                                      2.325384 0.010000 100.000000
       6665
               3000
              Dev_Reshign-All-All 1 3.402785 0.010000 100

5000 Dev_ResLow-All-All-All 1 1.636626 0.010000 100.000000

6000 Dev_Com-All-All-All 1 4.142739 0.010000 100.000000

7000 Dev_Ind-All-All-All 1 0.000000 0.010000 100.000000

8000 Dev_Inst-All-All-All 1 3.182982 0.010000 100.000000

9000 Dev_ResLow-All-All-All 1 21.112313 0.010000 100.000000

10000 Dev_Overspray-All-All-All 1 0.347450 0.010000 100

11111 Dev_Irrigated-All-West-Confired 2 0.000000
                                                     1 3.402785 0.010000 100.000000
       6665
               4000
       6665
       6665
       6665
       6665
       6665
                                                      6665
                       Dev_Irrigated-A-Low-Confined 2
               11111
       6665
                                                                                             400.000000
                                                             2 0.000000 0.010000 400.000000
       6665
              11112 Dev_Irrigated-A-Low-Unconfined
                                                              0.000000 0.010000 300.000000
       6665
               11121
                       Dev_Irrigated-A-Med-Confined 2
               11122 Dev_Irrigated-A-Med-Unconfined
                                                              2 0.000000 0.010000 300.000000
       6665
                                                              0.000000 0.010000 400.000000
       6665
              11211 Dev_Irrigated-B-Low-Confined 2
              11212 Dev_Irrigated-B-Low-Unconfined
11221 Dev_Irrigated-B-Med-Confined 2
                                                              2 0.000000 0.010000 400.000000
       6665
                                                              0.000000 0.010000 300.000000
       6665
                       Dev_Irrigated-B-Med-Confined 2
               11222 Dev_Irrigated-B-Med-Unconfined
                                                              2 0.000000 0.010000 300.000000
       6665
               11311
                                                              0.000000 0.010000 400.000000
       6665
                       Dev_Irrigated-C-Low-Confined 2
                                                              2 0.000000 0.010000 400.000000
       6665
               11312
                       Dev_Irrigated-C-Low-Unconfined
               11321 Dev_Irrigated-C-Med-Confined 2
                                                              0.000000 0.010000 300.000000
       6665
                                                              2 0.000000 0.010000 300.000000
       6665
               11322 Dev_Irrigated-C-Med-Unconfined
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C

С

С С

С

С

13311 -0.400000

-0.500000

-0.800000

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        11411
               Dev Irrigated-D-Low-Confined 2
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                                                                        0.010000
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                                                               1.510911
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6665
        11412
               Dev_Irrigated-D-Low-Unconfined
                                                        2
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        11421
6665
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        11422
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                                                        0.000000
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6665
        12112
                Dev Pervious-A-Low-Unconfined 2
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6665
        12121
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                                                                        0.010000
                                                                                        300.000000
                Dev Pervious-A-Med-Confined
        12122
                Dev Pervious-A-Med-Unconfined 2
6665
                                                        0.000000
                                                                        0.010000
                                                                                        300,000000
6665
        12211
                Dev_Pervious-B-Low-Confined
                                                        0.000000
                                                                        0.010000
                                                                                        400.000000
6665
        12212
                Dev_Pervious-B-Low-Unconfined 2
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                                                                        0.010000
                                                                                        400.000000
        12221
6665
                Dev Pervious-B-Med-Confined
                                                        0.000000
                                                                        0.010000
                                                                                        300.000000
        12222
6665
                Dev_Pervious-B-Med-Unconfined 2
                                                        0.000000
                                                                        0.010000
                                                                                        300.000000
6665
        12311
                Dev Pervious-C-Low-Confined
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                                                                        0.010000
                                                                                        400.000000
6665
        12312
                Dev_Pervious-C-Low-Unconfined 2
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                                                                        0.010000
                                                                                        400.000000
        12321
6665
                Dev Pervious-C-Med-Confined
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                                                                        0.010000
                                                                                        300.000000
6665
        12322
                Dev_Pervious-C-Med-Unconfined 2
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                                                                                        300.000000
                Dev_Pervious-D-Low-Confined
6665
        12411
                                                        0.000000
                                                                        0.010000
                                                                                        400.000000
        12412
                Dev_Pervious-D-Low-Unconfined 2
6665
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                                                                                        400.000000
6665
        12421
                Dev_Pervious-D-Med-Confined
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                                                                        0.010000
                                                                                        300.000000
6665
        12422
                Dev_Pervious-D-Med-Unconfined 2
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        13111
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6665
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        13222
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        13231
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               Agriculture-B-High-Confined
6665
        13232
                Agriculture-B-High-Unconfined 2
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                Agriculture-D-Low-Unconfined
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6665
        13431
                Agriculture-D-High-Confined
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                                                                                        400.000000
               Agriculture-D-High-Unconfined 2
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6665
        13432
                                                                                        400.000000
6665
        14121
                Veg_Low-A-Med-Confined 2
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                Veg Low-A-Med-Unconfined
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        14132
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                Veg Low-A-High-Unconfined
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        14221
                Veg_Low-B-Med-Confined 2
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6665
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                Veg_Low-B-Med-Unconfined
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                Veg_Low-C-Med-Confined 2
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        14322
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                                                2
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        14422
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                Veg_High-A-Med-Confined
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                Veg High-A-Med-Unconfined
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                Veg_High-B-High-Unconfined
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                Veg High-C-Med-Confined
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6671
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        2000
6671
                Road_Primary-All-All-All
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        3000
6671
                Road_Minor-All-All-All 1
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                                                                               100.000000
6671
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                Dev_ResHigh-All-All-All
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6671
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                Dev_ResLow-All-All-All 1
                                                5.720340
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6671
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        7000
6671
                Dev_Ind-All-All-All
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6671
        8000
                Dev_Inst-All-All-All
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6671
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                Veg_Low-B-High-Confined
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               Veg_Low-B-High-Unconfined
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6674
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               Veg Low-A-Med-Unconfined
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                Veg_Low-B-Med-Confined 2
6674
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6674
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6675
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       11212
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6675
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               Veg Low-B-Med-Unconfined
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                Veg Low-C-Med-Confined 2
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6839
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6844
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6844
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               Dev_Overspray-All-All-All
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6844
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6844
                Dev Irrigated-A-Med-Confined 2
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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6856
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6856
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       12422
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                Veg_Low-B-Med-Confined 2
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                Veg Low-C-Med-Confined 2
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6859
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6859
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6859
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6859
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6859
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6859
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               Road_Primary-All-All-All
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                Veg Low-A-Med-Confined 2
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6861
                Veg Low-B-Med-Confined 2
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                Veg_Low-B-Med-Unconfined
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                     14322 Veg_Low-C-Med-Unconfined
           6861 14331 Veg_Low-C-High-Confined
                                Veg_Low-C-High-Unconfined
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                    14421 Veg_Low-D-Med-Confined 2
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        Veg_High-B-Med-Confined
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                    14422
                                Veg_Low-D-Med-Unconfined
                                                                           2 18.002399 0.010000 300.000000
           6861 16000 Water-All-All 1 0.000000 0.010000 100.000000
r-----
c92 SNOW-FLAGS
c defid parameter group id c deluid landuse id
c iceflag 0 = Ice formation in the snow pack is not simulated
c 1 = \text{Ice formation is simulated}
c forest 0.0 - 1.0 Fraction of LAND covered by Forest (winter transpiration)
               parameter that adjusts for the effect of ice (in the snow pack) on infiltration when iceflag is 1
c fzq
(/in.)
                lower limit of inffac as adjusted by ice in the snow pack when iceflag is 1
c fzgl
c defid deluid iceflag forest fzg fzgl
C------
c93 snow-parm
c defid parameter group id c deluid landuse id c lat latitude of the pervious land segment (PLS) - ENERGY BALANCE METHOD ONLY (degree)
              positive for the northern hemisphere, negative for southern
c melev mean elevation of LAND above sea level - ENERGY BALANCE METHOD ONLY (ft) c shade fraction of LAND shaded from solar radiation (i.e. by trees) - ENERGY BALANCE METHOD ONLY
c snowcf precipitation-to-snow multiplier (accounts for poor gage-catch efficiency during snow)
c covind maximum snowpack (water equivalent) at which the entire LAND is covered with snow (in)
c defid deluid lat melev shade snowcf covind
C-----
c94 snow-parm2
c defid
               parameter group id
c deluid landuse id
c rdcsn density of cold, new snow relative to water (For snow falling at temps below freezing.
               at higher temperatures the density of snow is adjusted)
c tsnow air temperature below which precipitation will be snow, under saturated conditions (deg F)
              under non-saturated conditions the temperature is adjusted slightly.
c snoevp
              adapts sublimation equation to field conditions - ENERGY BALANCE METHOD ONLY
c ccfact adapts snow condensation/convection melt equation to field conditions - ENERGY BALANCE METHOD ONLY
c mwater maximum water content of the snow pack, in depth of water per depth of water.
c mgmelt
              maximum rate of snowmelt by ground heat, in depth of water per day (in/day)
               this is the value which applies when the pack temperature is at the freezing point.
c defid deluid rdcsn
                                       tsnow snoevp ccfact mwater mgmelt
C-----
c96 snow-init
     defid
                      parameter group id
     deluid
                       landuse id
    pack-snow initial quantity of snow in the pack (water equivalent).
    pack-ice initial quantity of ice in the pack (water equivalent).
pack-watr initial quantity of liquid water in the pack.
    rdenpf density of the frozen contents (snow and ice) of the pack, relative to water.

dull index of the dullness of the snow pack surface, from which albedo is estimated - ENERGY BALANCE
METHOD ONLY
c paktmp mean temperature of the frozen contents of the snow pack.
c covinx current snow pack depth (water equivalent) required to obtain complete areal coverage of LAND.
```

C

C

C

C

C

С C

С

С

C С

C С

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if the pack is less than this amount, areal coverage is prorated (PACKF/COVINX).
C
     xlnmlt
                     current remaining possible increment to ice storage in the pack.
С
                    relevant when Ice formation is simulated (iceflag = 1)
С
     skyclr
                   fraction of sky which is assumed to be clear at the present time.
c defid deluid pack-snow pack-ice pack-watr rdenpf dull paktmp covinx xlnmlt skyclr
c100 pwat-parm1
      pervious and impervious land hydrology control
C
      (value of 0 = use constant pwat-parm4; 1 = use corresponding monthly variable card)
С
C
   vcsfg
                interception storage capacity (card 150) upper zone nominal storage (card 160)
С
C
                 upper zone nominal storage
                manning's n for the overland flow plane (card 170)
     vnnfg
C
   vifwfg interflow inflow parameter (card 180)
vircfg interflow recession constant (card 190)
     vircfg interflow recession constant (card 190)
vlefg lower zone evapotranspiration (e-t) parameter (card 200)
C
С
c vcsfg vuzfg vnnfg vifwfg vircfg vlefg
c110 pwat-parm2
C
      defid parameter group id
С
     deluid landuse id
C
    lzsn
C
                lower zone nominal soil moisture storage (inches)
      infilt infiltration capacity of the soil (in/hr)
С
    kvary variable groundwater recession (1/inches)
C
      agwrc base groundwater recession (none)
С
                                            kvary agwrc
0.000000 0.000000
0.000000 0.000000
c defid deluid lzsn
                              infilt

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                  12412 7.000000
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                  12421 7.000000
12422 7.000000
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                  13111 7.000000
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                  13112 7.000000
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      0.800000
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      0.400000
      0.000000

                   13122 7.000000
          33
                                                                                       0.920000
                   13211 7.000000
                                                                                        0.920000
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2.2	12010	П 000000	0 400000	0 000000	0 000000
33	13212	7.000000	0.400000	0.000000	0.920000
33	13221	7.000000	0.400000	0.000000	0.920000
33	13222	7.000000	0.400000	0.00000	0.920000
33	13231	7.000000	0.400000	0.000000	0.920000
33	13232	7.000000	0.400000	0.000000	0.920000
33	13311	7.000000	0.200000	0.000000	0.920000
33	13312	7.00000	0.200000	0.00000	0.920000
33	13321	7.000000	0.200000	0.000000	0.920000
33	13322	7.000000	0.200000	0.00000	0.920000
33	13331	7.000000	0.200000	0.000000	0.920000
33	13411	7.000000	0.100000	0.000000	0.920000
33	13412	7.000000	0.100000	0.000000	0.920000
33	13421	7.00000	0.100000	0.00000	0.920000
33	13422	7.000000	0.100000	0.000000	0.920000
33	13431	7.000000	0.100000	0.00000	0.920000
33	13432	7.000000	0.100000	0.000000	0.920000
33	14121	8.500000	0.600000	0.000000	0.980000
33	14122	8.500000	0.600000	0.000000	0.980000
33	14131	8.500000	0.600000	0.000000	0.980000
33	14132	8.500000	0.600000	0.00000	0.980000
33	14221	8.500000	0.300000	0.000000	0.980000
33	14222	8.500000	0.300000	0.00000	0.980000
33	14231	8.500000	0.300000	0.000000	0.980000
33	14232	8.500000	0.300000	0.000000	0.980000
33	14321	8.500000	0.120000	0.000000	0.980000
				0.000000	
33	14322	8.500000	0.120000		0.980000
33	14331	8.500000	0.120000	0.000000	0.980000
33	14332	8.500000	0.120000	0.000000	0.980000
33	14421	8.500000	0.040000	0.000000	0.980000
33	14422	8.500000	0.040000	0.000000	0.980000
33	14431	8.500000	0.040000	0.000000	0.980000
33	14432	8.500000	0.040000	0.000000	0.980000
33	15121	8.500000	0.600000	0.000000	0.980000
33	15122	8.500000	0.600000	0.000000	0.980000
33	15131	8.500000	0.600000	0.000000	0.980000
33	15132	8.500000	0.600000	0.00000	0.980000
33	15221	8.500000	0.300000	0.000000	0.980000
33	15222	8.500000	0.300000	0.000000	0.980000
33	15231	8.500000	0.300000	0.000000	0.980000
33	15232	8.500000	0.300000	0.000000	0.980000
33	15321	8.500000	0.120000	0.000000	0.980000
33	15322	8.500000	0.120000	0.000000	0.980000
33	15331	8.500000	0.120000	0.000000	0.980000
33	15332	8.500000	0.120000	0.000000	0.980000
33	15421	8.500000	0.040000	0.000000	0.980000
33	15422	8.500000	0.040000	0.000000	0.980000
33	15431	8.500000	0.040000	0.000000	0.980000
33	15432	8.500000	0.040000	0.000000	0.980000
33	16000	0.000000	0.000000	0.000000	0.000000
40	1000	0.000000	0.000000	0.000000	0.000000
40	2000	0.000000	0.000000	0.000000	0.000000
40	3000	0.000000	0.000000	0.000000	0.000000
40	4000	0.000000	0.000000	0.000000	0.000000
40	5000	0.00000	0.000000	0.000000	0.000000
40	6000	0.000000	0.000000	0.000000	0.000000
40	7000	0.000000	0.000000	0.000000	0.000000
40	8000	0.000000	0.000000	0.000000	0.000000
		0.000000	0.000000		
40	9000			0.000000	0.000000
40	10000	0.000000	0.00000	0.00000	0.000000
40	11111	7.000000	0.400000	0.000000	0.920000
40	11112	7.000000	0.400000	0.000000	0.920000
40	11121	7.000000	0.400000	0.000000	0.920000
40	11122	7.000000	0.400000	0.000000	0.920000
40	11211	7.000000	0.200000	0.000000	0.920000
40	11212	7.000000	0.200000	0.000000	0.920000
40	11221	7.000000	0.200000	0.000000	0.920000
40	11222	7.000000	0.200000	0.000000	0.920000
40	11311	7.00000	0.080000	0.00000	0.920000
40	11312	7.000000	0.080000	0.000000	0.920000
40	11321	7.000000	0.080000	0.000000	0.920000
40	11322	7.000000	0.080000	0.000000	0.920000
40	11411	7.000000	0.040000	0.000000	0.920000
40	11412	7.000000	0.040000	0.000000	0.920000
40	11421	7.000000	0.040000	0.000000	0.920000
	11421		0.040000	0.000000	0.920000
40		7.000000			
40	12111	7.000000	0.400000	0.000000	0.920000
40	12112	7.000000	0.400000	0.000000	0.920000
40	12121	7.000000	0.400000	0.000000	0.920000
40	12122	7.000000	0.400000	0.000000	0.920000

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       12211 7.000000
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       12212 7.000000
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       15431 8.500000
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       15432 8.500000
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40
       16000 0.000000
                            0.000000
                                           0.000000
                                                          0.000000
```

```
c120 pwat-parm3
С
    defid
            parameter group id
    deluid landuse id
С
    petmax air temperature below which e-t will is reduced (deg F)
C
    petmin air temperature below which e-t is set to zero (deg F)
С
    infexp exponent in the infiltration equation (none)
    infild ratio between the maximum and mean infiltration capacities over the PLS (none)
C
    deepfr fraction of groundwater inflow that will enter deep groundwater (none)
С
    basetp fraction of remaining potential e-t that can be satisfied from baseflow (none)
    agwetp fraction of remaining potential e-t that can be satisfied from active groundwater (none)
С
```

c defid deluid petr 33 1000	max petmin 45.000000	infexp 35.000000	infild dee	epfr basetp 0.000000	agwetp 0.000000	0.000000
0.000000 33 2000	45.000000	35.000000	0.000000	0.00000	0.000000	0.000000
0.000000 33 3000	45.000000	35.000000	0.00000	0.00000	0.000000	0.000000
0.000000 33 4000	45.000000	35.000000	0.00000	0.00000	0.000000	0.000000
0.000000 33 5000	45.000000	35.000000	0.00000	0.00000	0.000000	0.000000
0.000000 33 6000	45.000000	35.000000	0.00000	0.00000	0.000000	0.000000
0.000000 33 7000	45.000000	35.000000	0.00000	0.00000	0.000000	0.000000
0.000000 33 8000	45.000000	35.000000	0.000000	0.00000	0.000000	0.000000
0.000000 33 9000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 33 10000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 33 11111	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000					0.300000	
0.000000	45.000000	35.000000	2.000000	2.000000		0.000000
33 11121 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 11122 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 11211 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 11212 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 11221 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 11222 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 11311 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 11312 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 11321 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 11322 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 11411 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 11412 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 11421 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 11422 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 12111 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 12112 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 12121	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12122	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12211	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12212	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12221	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12222	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12311	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12312	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12321	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12322	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12411	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000						

33 12412 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 12421 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 12422 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 13111	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13112	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13121	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13122	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13211	45.000000	35.000000	2.000000	2.000000	0.00000	0.000000
0.000000 33 13212	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13221	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13222	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13231	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13232	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13311						0.000000
0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	
33 13312 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 13321 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 13322 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 13331 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 13411 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 13412 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 13421 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 13422 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 13431 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 13432	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14122	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14131	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14132	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14221	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14222	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14231	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14232	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14321	45.000000	35.000000	2.000000	2.000000	0.00000	0.010000
0.030000 33 14322	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14331	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14332	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14421	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000						
33 14422 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
33 14431 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000

40 11121 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000				2.000000		
0.000000 40 11112	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 11111	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 10000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
40 9000 0.000000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
40 8000 0.000000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
40 7000 0.000000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
40 6000 0.000000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
40 5000 0.000000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
40 4000 0.000000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000	45.000000	35.000000	0.000000	0.000000	0.000000	
0.000000						0.000000
0.000000 40 2000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.030000 40 1000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.030000 33 16000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 15432	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 15431	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 15422	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 15421	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 15332	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 15331	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 15322	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 15321	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 15232	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
33 15231	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
33 15222 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
33 15221 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
33 15132 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
33 15131 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
33 15122 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
33 15121 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
33 14432 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
	45 000000	25 22222				

40 11322 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 11411 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 11412 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 11421 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 11422	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 12111	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 12112	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 12121	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 12122	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 12211	45.000000	35.000000	2.000000	2.000000	0.00000	0.000000
0.000000 40 12212	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 12221	45.000000	35.000000	2.000000	2.000000	0.00000	0.000000
0.000000 40 12222	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 12311	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 12312	45.000000	35.000000	2.000000	2.000000	0.300000	0.00000
0.000000 40 12321	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 12322	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000				2.000000		
0.000000	45.000000	35.000000	2.000000		0.000000	0.000000
40 12412 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 12421 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 12422 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 13111 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 13112 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 13121 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 13122 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 13211 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 13212 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 13221 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 13222 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 13231 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 13232	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 13311	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 13312	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 13321	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 13322	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 13331	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 13411	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 13412	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 13421	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000	-	-				

40 13422	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 13431	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 13432	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 14121	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14122	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14131	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14132	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14221	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14222	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14231	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14232	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14321	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14322	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14331	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14332	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14421	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14422	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14431	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14432	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15121	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15122	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15131	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15132	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15221	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15222	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15231	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15232	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15321	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15322	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15331	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15332	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15421	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15422	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15431	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15432	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 16000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000						

c130 pwat-parm4

С

c defid parameter group id
c deluid landuse id
c cepsc interception storage capacity (inches)
c uzsn upper zone nominal storage (inches)

 $\begin{array}{lll} c & & \text{nsur} & & \text{Manning's n for the assumed overland flow plane (none)} \\ c & & \text{intfw} & & \text{interflow inflow parameter (none)} \end{array}$

intfw interflow inflow parameter (none)
irc interflow recession parameter (none)
lzetp lower zone e-t parameter (none)

C	
C	

С

C							
c defid deluid	d cepso 1000		nsur 0.000000	intfw irc	lzetp 0.000000	0 000000	0 000000
33 33	2000	0.040000 0.040000	0.000000	0.011000 0.011000	0.000000	0.000000	0.000000
33	3000	0.040000	0.000000	0.011000	0.000000	0.000000	0.000000
33	4000	0.040000	0.000000	0.011000	0.000000	0.000000	0.000000
33	5000	0.040000	0.000000	0.011000	0.000000	0.000000	0.000000
33	6000	0.040000	0.000000	0.011000	0.000000	0.000000	0.000000
33	7000	0.040000	0.000000	0.011000	0.000000	0.000000	0.000000
33	8000	0.040000	0.000000	0.011000	0.000000	0.000000	0.000000
33	9000	0.020000	0.000000	0.011000	0.000000	0.000000	0.000000
33	10000	0.040000	0.000000	0.011000	0.000000	0.000000	0.000000
33	11111	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	11112	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	11121	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	11122	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	11211	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	11212	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	11221	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	11222	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	11311	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
33	11312	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
33	11321	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	11322	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	11411	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	11412	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	11421	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	11422	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	12111	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33 33	12112 12121	0.060000 0.060000	0.700000 0.560000	0.200000 0.200000	0.500000 0.500000	0.300000 0.300000	0.200000 0.200000
33	12121	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	12122	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	12211	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	12221	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	12222	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	12311	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	12312	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	12321	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	12322	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	12411	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	12412	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
33	12421	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	12422	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
33	13111	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
33	13112	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
33	13121	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
33	13122	0.100000	0.560000	0.200000	1.000000	0.30000	0.500000
33	13211	0.100000	0.700000	0.200000	1.000000	0.300000	0.500000
33	13212	0.100000	0.700000	0.200000	1.000000	0.300000 0.300000	0.500000
33	13221	0.100000	0.560000 0.560000	0.200000	1.000000	0.300000	0.500000
33 33	13222 13231	0.100000 0.100000	0.420000	0.200000 0.200000	1.000000	0.300000	0.500000 0.500000
33	13231	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
33	13311	0.100000	0.700000	0.200000	1.000000	0.300000	0.500000
33	13312	0.100000	0.700000	0.200000	1.000000	0.300000	0.500000
33	13321	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
33	13322	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
33	13331	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
33	13411	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
33	13412	0.100000	0.700000	0.200000	1.000000	0.300000	0.500000
33	13421	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
33	13422	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
33	13431	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
33	13432	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
33	14121	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
33	14122	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
33	14131	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	14132	0.100000	0.680000	0.200000	1.000000	0.300000	0.70000
33	14221	0.130000	0.850000	0.200000	1.000000	0.300000	0.70000
33	14222	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
33	14231	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	14232	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	14321	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
33	14322	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000

33	14331	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	14332	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	14421	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
33	14422	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
33	14431	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	14432	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	15121	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15122	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15131	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15132	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15221	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15222	0.150000	0.850000	0.250000	1.000000	0.30000	0.700000
33	15231	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15232		0.680000				
		0.130000		0.250000	1.000000	0.300000	0.700000
33	15321	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15322	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15331	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15332	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15421	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15422	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15431	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15432	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	16000	0.000000	0.000000	0.00000	0.00000	0.000000	0.000000
40	1000	0.040000	0.00000	0.011000	0.000000	0.000000	0.000000
40	2000	0.040000	0.00000	0.011000	0.000000	0.00000	0.000000
40	3000	0.040000	0.00000	0.011000	0.000000	0.000000	0.000000
40	4000	0.040000	0.00000	0.011000	0.000000	0.000000	0.000000
40	5000	0.040000	0.00000	0.011000	0.000000	0.00000	0.000000
40	6000	0.040000	0.00000	0.011000	0.000000	0.000000	0.000000
40	7000	0.040000	0.00000	0.011000	0.000000	0.000000	0.000000
40	8000	0.040000	0.00000	0.011000	0.000000	0.00000	0.00000
40	9000	0.020000	0.00000	0.011000	0.000000	0.000000	0.000000
40	10000	0.040000	0.00000	0.011000	0.000000	0.000000	0.000000
40	11111	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11112	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11121	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11122	0.060000	0.560000	0.200000	0.500000	0.30000	0.200000
40	11211	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
	11212						
40		0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11221	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11222	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11311	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	11312	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11321	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11322	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11411	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11412	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11421	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11422	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12111	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	12112	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	12121	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12122	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12211	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	12212	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
		0.060000			0.500000		0.200000
40	12221		0.560000	0.200000		0.300000	
40	12222	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12311	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	12312	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	12321	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12322	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12411	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	12412	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	12421	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12422	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	13111	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13112	0.100000	0.700000	0.200000	1.000000	0.300000	0.500000
40	13121	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13122	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13211	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13212	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13221	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13222	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13231	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
40	13232	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
40	13311	0.100000	0.700000	0.200000	1.000000	0.300000	0.500000
40	13312	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13321	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13322	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000

40	13331	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
40	13411	0.100000	0.700000	0.200000	1.000000	0.300000	0.500000
40	13412	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13421	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13422	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13431	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
40	13432	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
40	14121	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14122	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14131	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14132	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14221	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14222	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14231	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14232	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14321	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14322	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14331	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14332	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14421	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14422	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14431	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14432	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	15121	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15122	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15131	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15132	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15221	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15222	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15231	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15232	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15321	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15322	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15331	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15332	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15421	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15422	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
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40	15432	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	16000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

g------

```
c140 pwat-state1
   initial conditions for the simulation
C
   defid parameter group id deluid landuse id
С
C
С
   ceps initial interception storage.
             initial surface (overland flow) storage.
C
   surs
    uzs
С
             initial upper zone storage.
    ifws
            initial interflow storage.
С
    lzs
            initial lower zone storage.
    agws initial active groundwater storage.
gwvs initial index to groundwater slope.
    agws
С
```

C											
c defid	deluid	ceps	surs	uzs	ifws	lzs	ε	agws	gwvs		
	33	1000	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	2000	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	3000	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	4000	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	5000	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	6000	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	7000	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	8000	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	9000	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	10000	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	11111	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000										
	33	11112	0.000000	0.0000	000	0.400000		0.000000)	9.000000	2.000000
	0.50000	0									

33 11121 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 11122 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 11211 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
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0.500000 33 11222	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
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0.500000 33 12111						2.000000
0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	
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33 12122 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 12211 0.500000	0.00000	0.000000	0.400000	0.000000	9.000000	2.000000
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0.500000	0.00000	0.00000	0.10000	3.00000	J.00000	2.000000

33 13232 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
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0.500000 33 15322	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15331	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000						

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0.500000						

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0.500000 40 13122	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13211 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
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0.500000 40 13312	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13321 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 13322 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
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40 13411 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
40 13412 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
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40 13432 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
40 14121 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
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40 14221 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
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40 14232 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 14321	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000						

0.500000							
40		2 0.000000	0.000000	0.400000	0.00000	9.000000	2.000000
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0.550000		2 0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.550000	0.500000						2.000000
0.500000		1 0.000000			0.000000		2.000000
14431		2 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
14432 0.000000 0.000000 0.400000 0.000000 9.000000 2.	40 1443	1 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40		2 0.000000	0.000000	0.400000	0.00000	9.000000	2.000000
0.500000 40 15122 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15131 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15132 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15221 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15222 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15232 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15322 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15322 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15332 0.000000 0.00000 <td< td=""><td></td><td>1 0.000000</td><td>0.00000</td><td>0.400000</td><td>0.000000</td><td>9.000000</td><td>2.000000</td></td<>		1 0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
40		2 0.000000	0.00000	0.10000	0.00000	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2.00000
40	40 1512	2 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15132 0.000000 0.000000 0.000000 9.000000 2. 0.500000 40 15221 0.000000 0.000000 0.000000 9.000000 2. 40 15222 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15221 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15231 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15322 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 0.500000 0.000000 0.400000 0.000000 9.000000 2. 40 15332 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15332 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15421 0.000000 0.000000 0.400000 <td>40 1513</td> <td>1 0.000000</td> <td>0.000000</td> <td>0.400000</td> <td>0.000000</td> <td>9.000000</td> <td>2.000000</td>	40 1513	1 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 15221 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15222 0.000000 0.400000 0.000000 9.000000 2. 40 15231 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15232 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15321 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15322 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15331 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15421 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15431 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15431		2 0 000000	0 000000	0 40000	0 000000	9 000000	2.000000
40 15221 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15222 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15231 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15232 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15321 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15332 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15332 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15332 0.000000 0.000000 0.400000 0.000000 9.000000 2. 40 15421 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15422 0.000000 0.000000 0.400000 0.000000 9.000000 2.		2 0.000000	0.00000	0.100000	0.000000	3.000000	2.000000
40 15222 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15231 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15232 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15321 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15332 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15331 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15322 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15421 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15431 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15431 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000		1 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15231 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15232 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15321 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15322 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15331 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15421 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15422 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15422 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000 40 15431 0.000000 0.000000 0.400000 0.000000 9.000000 2.0500000	40 1522	2 0.000000	0.000000	0.400000	0.00000	9.000000	2.000000
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	40 1523	1 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		2 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		1 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	40 1532	2 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		1 0 00000	0 000000	0 400000	0.00000	0 000000	2.000000
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		1 0.000000	0.00000	0.40000	0.00000	9.000000	2.000000
40 15421 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15422 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15431 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 0.500000 0.000000 0.400000 0.000000 9.000000 2.	40 1533	2 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15422 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000 40 15431 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000	40 1542	1 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15431 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000		2 0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000		1 0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
40 15432 0 000000 0 000000 0 400000 0 000000 2		_ 0.000000	2.22200	0.10000			2.00000
40 15432 0.000000 0.000000 0.400000 0.000000 9.000000 2. 0.500000	40 1543 0.500000	2 0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
	40 1600	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000

```
c150 mon-interception storage (cepscm)
c only required if vcsfg=1 in pwat-parm1 (see card 100)
C
  defid parameter group id deluid landuse id
С
C
С
   jan-dec interception storage capacity at start of each month (inches)
С
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c160 mon-upper zone nominal storage (uzsnm)
c only required if vuzfg=1 in pwat-parm1 (see card 100)
C
c defid parameter group id c deluid landuse id
   jan-dec upper zone nominal storage at start of each month (inches)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c170 mon-Manning's roughness coefficient (nsurm)
  only required if vnnfg=1 in pwat-parm1 (see card 100)
С
   defid parameter group id
С
  deluid landuse id
С
   jan-dec Manning's roughness coefficient at start of each month (none)
C
c defid deluid jan feb mar
                                          jun jul aug sep oct nov dec
                               apr
                                     may
c180 mon-interflow inflow parameter (intfwm)
c only required if vifwfg=1 in pwat-parm1 (see card 100)
```

```
defid parameter group id
C
    deluid landuse id
С
C
    jan-dec interflow inflow parameter at start of each month (none)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c-----
c190 mon-interflow recession constant (ircm)
    only required if vircfg=1 in pwat-parm1 (see card 100)
C
    defid parameter group id deluid landuse id
C
С
   jan-dec interflow recession constant at start of each month (none)
C
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c200 mon-lower zone evapotranspiration parameter (lzetpm)
   only required if vlefg=1 in pwat-parm1 (see card 100)
C
C
   defid parameter group id
C
    deluid landuse id
C
    jan-dec lower zone evapotranspiration parameter at start of each month (none)
С
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c201 Irrigation Application Option Flags
cIrrigation flag decide whether to run irrigation
C
    irrigfg if = 1 run irrigation option
petfg if = 1 use constant PET rather than time series from the air file
С
  petfg
C
c monVaryIrrig if = 1 use monthly varying ET coefficient
C
c irrigfg petfg monVaryIrrig
  1 1 1
c-----
                          ______
c202 Irrigation PET Value
c defid Group ID number.
c petval Constant PET value to calculate actual ET (in/hr)
C
c defid petval
   33 0.500000
      40
            0.500000
c203 Irrigation Application Options
c defid Group ID number.
c deluid Landuse ID number
c startmonth startmonth of irrigation requirement
c endmonth endmonth of irrigation requirement
c fraction1 fraction of irrigation requirement applied over the canopy.
c fraction2 fraction of irrigation water applied directly to the soil surface.
c fraction3 fraction of irrigation water applied to the upper soil zone via buried systems
c fraction4 fraction of irrigation water likewise applied to the lower soil zone.
   fraction5 fraction of irrigation water entering directly into the local groundwater, such as seepage
C
irrigation.
c etcoeff
             Coefficient to calculate actual ET, based on PET.
c etdays
             Number of threshold days to calculate irrigation demand (pet*etcoeff - precip)
               (if etdays = 0 then irrigation demand = pet * etcoeff)
C
C
c defid deluid startmonth endmonth fraction1 fraction2 fraction3 fraction4 fraction5 etcoeff etdays
       33 1000 1 12 0.000000 0.000000
                                                             0.000000 0.000000
                                                                                          0.000000
       1.000000
                    0
                   1
       33 2000
                          12
                                 0.000000
                                               0.000000
                                                              0.000000
                                                                           0.000000
                                                                                          0.000000
       1.000000
                    0
                                  0.000000
                                                              0.000000
                          12
                                                0.000000
                                                                           0.000000
       33 3000
                     1
                                                                                          0.000000
                    0
       1.000000
       33 4000
                          12
                                  0.000000
                                                0.000000
                                                              0.000000
                                                                           0.000000
                                                                                          0.000000
                   1
                    0
       1.000000
       33 5000
                          12
                                  0.000000
                                                0.000000
                                                              0.000000
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                                                                                          0.000000
       1.000000
                    Ω
                   1
       33 6000
                          12
                                  0.000000
                                                0.000000
                                                              0.000000
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       1.000000
                     0
       33 7000
                          12
                                  0.000000
                                                0.000000
                                                              0.000000
                                                                            0.000000
                                                                                          0.000000
                     1
       1.000000
       33 8000 1
                                  0.000000
                          12
                                                0.000000
                                                              0.000000
                                                                            0.000000
                                                                                          0.000000
       1.000000
                    0
       33 9000 1
                          12
                                  0.000000
                                                0.000000
                                                              0.000000
                                                                           0.000000
                                                                                          0.000000
       1.000000
                   0
                                                                            0.000000
                                                0.000000
       33 10000 1
                          12
                                  1.000000
                                                              0.000000
                                                                                          0.000000
       1.000000
                    0
```

33 11111	1	12	1.000000	0.000000	0.000000	0.00000	0.000000
1.000000 33 11112	0 1	12	1.000000	0.00000	0.000000	0.00000	0.000000
1.000000 33 11121	0 1	12	1.000000	0.00000	0.000000	0.00000	0.000000
1.000000 33 11122	0 1	12	1.000000	0.00000	0.00000	0.00000	0.000000
1.000000	0						
33 11211 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11212 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11221 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11222 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11311	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 11312	0 1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 11321	0 1	12	1.000000	0.00000	0.000000	0.000000	0.000000
1.000000 33 11322	0 1	12	1.000000	0.00000	0.000000	0.00000	0.000000
1.000000 33 11411	0 1	12	1.000000	0.00000	0.00000	0.00000	0.000000
1.000000 33 11412	0	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
33 11421 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11422 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 12111 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12112 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12121	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 12122	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 12211	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 12212	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000 33 12221	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 33 12222	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 33 12311	0 1	12	0.000000	0.00000	0.00000	0.000000	0.000000
1.000000	0		0.000000		0.000000	0.000000	
1.000000	0	12		0.000000			0.000000
33 12321 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12322 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12411 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12412 1.000000	1 0	12	0.000000	0.00000	0.000000	0.000000	0.000000
33 12421	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 12422	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 13111	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 13112	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000 33 13121	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 33 13122	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0		0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	1	12					
33 13212 1.000000	1	12	0.000000	0.00000	0.000000	0.000000	0.000000
33 13221 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000

33 13222	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 13231	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 13232	0 1	12	0.00000	0.000000	0.00000	0.00000	0.000000
1.000000 33 13311	0 1	12	0.00000	0.000000	0.00000	0.000000	0.000000
1.000000	0						
33 13312 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 13321 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 13322 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 13331 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 13411	1	12	0.00000	0.000000	0.000000	0.000000	0.000000
1.000000 33 13412	0	12	0.000000	0.000000	0.000000	0.00000	0.000000
1.000000 33 13421	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 13422	0 1	12	0.00000	0.00000	0.00000	0.00000	0.000000
1.000000 33 13431	0 1	12	0.00000	0.000000	0.00000	0.00000	0.000000
1.000000 33 13432	0 1	12	0.00000	0.000000	0.00000	0.000000	0.000000
1.000000 33 14121	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
33 14122 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 14131 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 14132 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 14221 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 14222 1.000000	1 0	12	0.000000	0.000000	0.000000	0.00000	0.000000
33 14231	1	12	0.00000	0.000000	0.000000	0.000000	0.000000
1.000000 33 14232	0	12	0.000000	0.000000	0.000000	0.00000	0.000000
1.000000 33 14321	0 1	12	0.000000	0.000000	0.000000	0.00000	0.000000
1.000000 33 14322	0 1	12	0.00000	0.00000	0.00000	0.00000	0.000000
1.000000 33 14331	0 1	12	0.000000	0.000000	0.00000	0.00000	0.000000
1.000000 33 14332	0 1	12	0.00000	0.000000	0.00000	0.00000	0.000000
1.000000 33 14421	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
33 14422 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 14431 1.000000	1 0	12	0.00000	0.000000	0.00000	0.000000	0.000000
33 14432 1.000000	1 0	12	0.00000	0.000000	0.000000	0.00000	0.000000
33 15121 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 15122 1.000000	1 0	12	0.000000	0.000000	0.000000	0.00000	0.000000
33 15131	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 15132	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 15221	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 15222	0 1	12	0.000000	0.00000	0.00000	0.000000	0.000000
1.000000 33 15231	0 1	12	0.00000	0.00000	0.00000	0.000000	0.000000
1.000000 33 15232	0 1	12	0.00000	0.000000	0.00000	0.000000	0.000000
1.000000 33 15321	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0	14	0.00000	0.00000	0.00000		3.00000

33 15322	1	12	0.000000	0.000000	0.00000	0.000000	0.000000
1.000000 33 15331	0 1	12	0.000000	0.000000	0.00000	0.000000	0.000000
1.000000 33 15332	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000 33 15421	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000	0						
33 15422 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 15431 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 15432 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 16000 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 1000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 3000	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 4000	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 5000	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000 40 6000	0 1	12	0.000000	0.000000	0.000000	0.00000	0.000000
1.000000 40 7000	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
40 8000 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 9000 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 10000 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11111 1.000000	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11112 1.000000	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11121	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11122	0	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11211	0 1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11212	0 1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11221	0 1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11222	0 1	12	1.000000	0.00000	0.000000	0.000000	0.000000
1.000000 40 11311	0	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
40 11312 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11321 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11322 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11411 1.000000	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11412 1.000000	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11421	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11422	0 1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 12111	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 12112	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 12121	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 12122	0 1	12	0.000000	0.000000	0.000000	0.00000	0.000000
1.000000 40 12211	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0	14	3.00000	3.00000	3.00000	0.00000	0.00000

40 12212	1	12	0.000000	0.000000	0.000000	0.00000	0.000000
1.000000 40 12221	0 1	12	0.000000	0.000000	0.000000	0.00000	0.000000
1.000000 40 12222	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 12311	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000	0	12					
1.000000	1		0.000000	0.00000	0.000000	0.000000	0.000000
40 12321 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 12322 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 12411 1.000000	1 0	12	0.000000	0.00000	0.000000	0.000000	0.000000
40 12412 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 12421	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 12422	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13111	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13112	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 13121	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 13122	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 13211	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
40 13212 1.000000	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 13221 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 13222 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 13231 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 13232 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 13311 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 13312	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13321	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13322	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13331	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13411	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 13412	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 13421	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 13422	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
40 13431 1.000000	1 0	12	0.000000	0.00000	0.000000	0.000000	0.000000
40 13432 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 14121 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 14122 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 14131 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 14132	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14221	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14222	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14231	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000	0						

	0 14232	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
	.000000	0						
	.0 14321 .000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
	0 14322	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1	.000000	0						
	0 14331	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
	.000000	0						
	0 14332	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
	.000000	0						
	0 14421	1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1	.000000	0						
	0 14422	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1	.000000	0						
4	0 14431	1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1	.000000	0						
4	0 14432	1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1	.000000	0						
4	.0 15121	1	12	0.000000	0.00000	0.000000	0.00000	0.000000
	.000000	0						
	0 15122	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
	.000000	0	12	0.00000	0.00000	0.00000	0.00000	0.000000
	0 15131	1	12	0.000000	0.00000	0.000000	0.00000	0.000000
			12	0.00000	0.000000	0.00000	0.00000	0.000000
	.000000	0	1.0	0 000000	0.000000	0 000000	0.000000	0 000000
	0 15132	1	12	0.000000	0.00000	0.000000	0.00000	0.000000
	.000000	0						
	0 15221	1	12	0.000000	0.000000	0.000000	0.00000	0.000000
	.000000	0						
	0 15222	1	12	0.000000	0.00000	0.000000	0.000000	0.000000
	.000000	0						
4	0 15231	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1	.000000	0						
4	0 15232	1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1	.000000	0						
4	0 15321	1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1	.000000	0						
4	.0 15322	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1	.000000	0						
4	.0 15331	1	12	0.000000	0.00000	0.000000	0.000000	0.000000
	.000000	0						
	0 15332	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
	.000000	0	12	0.00000	0.00000	0.00000	0.00000	0.000000
	0 15421	1	12	0.000000	0.00000	0.000000	0.00000	0.000000
	.000000	0	12	0.00000	0.000000	0.00000	0.00000	0.000000
	0 15422		1.0	0 000000	0.000000	0 000000	0.000000	0 000000
		1	12	0.000000	0.00000	0.000000	0.00000	0.000000
	.000000	0	1.0	0 000000	0.00000	0 000000	0.00000	0 000000
	0 15431	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
	.000000	0						
	0 15432	1	12	0.000000	0.000000	0.000000	0.00000	0.000000
	.000000	0						
	0 16000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1	.000000	0						

C-----

c204 Monthly-variable ET coefficients

c defid Group ID number. c deluid Landuse ID number

0.000000

0.000000

c monetcs Monthly-variable coefficient to calculate actual ET for Jan..Dec

0.000000

С c defid deluid monETCs1 monETCs2 monETCs3 monETCs4 monETCs5 monETCs6 monETCs7 monETCs8 monETCs9 monETCs10 monETCs11 monETCs12 33 1000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 2000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 33 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 33 3000 0.000000 0.000000 0.00000 0.000000 0.000000 0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 33 4000 0.000000 0.000000 0.00000 0.000000 0.000000 0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 5000 33 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 6000 0.000000 33 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 7000 0.000000 0.000000 33 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 8000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 33 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 9000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 33

0.000000

0.000000

0.000000

33 10000	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11111	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0.011007
						0 011505
33 11112	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11121	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11122	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554		0.011520	0.009339	0.006252		0.011307
	0.013237				0.000000	0 044505
33 11211	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11212	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11221	0.000569	0.001419				0 011507
			0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11222	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.00000	
33 11311	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0.011507
						0 011505
33 11312	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11321	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11322	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
						0.011307
0.012554	0.013237	0.011520	0.009339	0.006252	0.00000	
33 11411	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.00000	
33 11412	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	****
						0 011507
33 11421	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11422	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 12111	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 12112	0.00000	0.000000	0.000000	0.000000	0.000000	0.000000
0.00000	0.000000	0.00000	0.00000	0.00000	0.00000	
33 12121	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.000000	0.00000	0.000000	0.000000	
33 12122	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 12211	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 12212	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0 000000
33 12221	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.00000	0.00000	0.000000	0.000000	0.00000	0.000000	
33 12222	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 12311	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0 000000
33 12312	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.00000	0.000000	0.000000	
33 12321	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.000000	0.00000	0.000000	0.000000	
33 12322	0.000000	0.000000	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 12411	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 12412	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.000000	0.00000	0.000000	0.000000	
33 12421	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 12422	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000	0.000000	0.000000	0.00000	0.000000	
33 13111	0.000000	0.000000	0.00000	0.000000	0.00000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
						0 000000
33 13112	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.00000	
33 13121	0.000000	0.000000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.000000	0.00000	0.000000	0.000000	
33 13122	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.00000	
33 13211	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 13212	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 13212 0.000000	0.000000	0.000000	0.000000	0.000000 0.000000	0.00000	0.000000

33 13221	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
				0.000000	0.000000	0.00000
33 13222	0.000000	0.00000	0.000000			0.00000
0.000000	0.000000	0.00000	0.00000	0.00000	0.00000	
33 13231	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 13232	0.00000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 13311	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0 000000
33 13312	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 13321	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 13322	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 13331	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
	0.000000					0 000000
		0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
33 13412	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
33 13421	0.000000	0.00000	0.00000	0.00000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 13422	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 13431	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 13432	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14121	0.00000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14122	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 14131	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0.00000
0.000000	0.000000	0.00000	0.00000	0.00000	0.00000	
33 14132	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14221	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14222	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14231	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 14232	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
33 14321	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.00000	0.00000	0.000000	
33 14322	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14331	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
33 14332	0.000000	0.00000	0.00000	0.00000	0.000000	0.00000
0.000000	0.000000	0.00000	0.00000	0.00000	0.00000	
33 14421	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14422	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14431	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 14432	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0.00000
0.000000	0.000000	0.00000	0.00000	0.00000	0.00000	
33 15121	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 15122	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.00000	0.00000	
33 15131	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 15132	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
						0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	0 0000==
33 15221	0.000000	0.00000	0.00000	0.00000	0.00000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 15222	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
33 15231	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 15232	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000			0.00000
0.000000	0.000000	0.00000	0.00000	0.00000	0.000000	

33 15321	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 15322	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 15331	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 15332	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 15421	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 15422	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 15431	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 15432	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 16000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 1000	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.00000	0.00000	0.000000	
40 2000	0.000000	0.00000	0.00000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
40 3000	0.000000	0.00000	0.00000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 4000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 5000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
	0.000000			0.000000		0.00000
0.000000		0.000000	0.000000		0.000000	0 000000
40 6000	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 7000	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.00000	0.00000	0.000000	
40 8000	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 9000	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 10000	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
						0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0 011505
40 11111	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11112	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11121	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11122	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11211	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0.011307
						0 011507
40 11212	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11221	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11222	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11311	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11312	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11321	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0.011307
				0.005918		0.011507
40 11322	0.000569	0.001419	0.001327		0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0 011505
40 11411	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11412	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11421	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11422	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 12111	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 12112	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0 000000
40 12121	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 12122	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	

40 12211	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
40 12212	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 12221	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 12222	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 12311	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
40 12312	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
40 12321	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 12322	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 12411	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 12412	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.00000	0.000000	0.000000	
40 12421	0.000000	0.00000	0.00000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
40 12422	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13111	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 13112	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 13121	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13122	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.00000	0.000000	0.000000	
40 13211	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13212	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 13221	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 13222	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.00000	0.00000	0.000000	
40 13231	0.000000	0.000000	0.00000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
40 13232	0.00000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13311	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 13312	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0 000000
40 13321	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 13322	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.000000	0.00000	0.000000	0.000000	
40 13331	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
40 13411	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13412	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13421	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
				0.000000		0.000000
	0.000000	0.000000	0.000000		0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 13431	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 13432	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 14121	0.000000	0.00000	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 14122	0.000000	0.00000	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 14131	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 14132	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
	0.000000					0 000000
40 14221		0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 14222	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	

40 1423	1 0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.00000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 1423	2 0.000000	0.00000	0.00000	0.000000	0.00000	0.000000
0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	
40 1432	1 0.000000	0.000000	0.00000	0.000000	0.00000	0.000000
0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	
40 1432	2 0.000000	0.000000	0.00000	0.000000	0.00000	0.000000
0.00000	0.00000	0.000000	0.000000	0.00000	0.000000	
40 1433	1 0.000000	0.000000	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000	0.000000	0.000000	0.000000	0.00000	
40 1433	2 0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	
40 1442	1 0.000000	0.000000	0.00000	0.000000	0.00000	0.000000
0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	
40 1442	2 0.000000	0.000000	0.00000	0.000000	0.00000	0.000000
0.00000	0.00000	0.00000	0.00000	0.000000	0.00000	
40 1443		0.000000	0.00000	0.000000	0.00000	0.000000
0.00000	0.00000	0.000000	0.000000	0.000000	0.00000	
40 1443		0.000000	0.00000	0.000000	0.00000	0.000000
0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	
40 1512		0.00000	0.00000	0.00000	0.000000	0.000000
0.00000	0.00000	0.000000	0.00000	0.00000	0.00000	
40 1512		0.00000	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000	0.00000	0.000000	0.00000	0.00000	
40 1513		0.000000	0.00000	0.000000	0.00000	0.000000
0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	
40 1513		0.000000	0.00000	0.000000	0.00000	0.000000
0.00000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 1522		0.000000	0.000000	0.000000	0.00000	0.000000
0.00000	0.00000	0.000000	0.00000	0.000000	0.00000	
40 1522		0.000000	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000	0.000000	0.000000	0.000000	0.00000	
40 1523		0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 1523		0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 1532		0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 1532		0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 1533		0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 1533		0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 1542		0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 1542	2 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000		0.000000	0.000000 0.000000	0.000000	0.000000 0.000000	0.00000
	1 0.000000	0.000000		0.000000		0.00000
0.000000 40 1543	0.000000 2 0.000000	0.00000	0.000000	0.00000 0.00000	0.000000 0.000000	0.000000
0.000000						0.00000
40 1600	0.00000 0 0.00000	0.00000	0.000000	0.000000 0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.00000	0.000000	0.00000
0.000000		0.000000	0.000000	0.00000	0.000000	
c205 Irrigation Wit						
c Irrigation withdr	-		rched			
_	awar midimatio bbasin id	IOI Cacii wale	1 DIICA			
		ere water is wit	hdrawn (if read	sh does not evis	t then	
		med to be satisf			C CIICII	
		ion withdrawal p		JOING DOULCE)		
c iiiigaep ae	ron or initigati	wicharawai p	-FC (40)			
c subbasin rchid						
6665 0	0.000000					
6671 0	0.000000					
6673 0	0.000000					
6674 0	0.000000					
6675 0	0.000000					
6684 0	0.000000					
6839 0	0.000000					
6844 0	0.000000					
6850 0	0.000000					
6856 0	0.000000					
6859 0	0.000000					
6861 0	0.000000					
C						

c250 general quality constituent control

c c defid parameter group id

```
dwaid
            general quality id
C
    qname
            name of qual (must be a continuous string)
С
    qunit
С
            units for quality constituent output (mg/l), (ug/l), or (#/100ml)
           if = 0 no sediment associated qual
С
    qsdfq
       if = 1 sediment associated in pervious/impervious land (qsdfg should be > 0 in card 281)
C
       if = 2 sediment associated in pervious/impervious land
С
             and sediment associated qual is added to the dissolved part
С
            if = 0 general quality constituent
C
С
            if = 1 general quality constituent simulated as a sediment (only one qual can be simulated as a
sediment in each group)
            if = 1 then then accumulation and removal occur daily
С
    asofa
             if = 2 then then accumulation and removal occur every interval
С
    potfcfg if = 1 then apply background concentration potency factor (card 260) to only surface output
С
             if = 2 then apply background concentration potency factor (card 260) to total land output
C
C
c defid dwqid
             qname qunit qsdfg gqsdfg qsofg potfcfg
                           (mg/1) 0
             3
      33
                    TN
                           (mg/l) 2
             7
      33
                    TP
                                         Ω
       33
             10
                    TCd
                           (ug/1) 2
       33
             11
                    TCu
                           (ug/1) 2
                                       0
                                                2
                                                      1
                                       0
0
       33
                    TPb
                           (ug/1) 2
                                                2
             12
                           (ug/l) 2
      33
                   TZn
             14
                                                2
             3
       40
                                              2
                  TN
                          (mg/1) 0
                                       0
                                       0
       40
             7
                    TP
                           (mg/1) 2
                                                2
                                                      1
                   TCd
      40
             10
                           (ug/1) 2
                                                2
                                       0
                  TCu
                           (ug/1) 2
       40
             11
                           (ug/1) 2
                                       0
0
       40
             12
                    TPh
                                                2
                                                      1
             14
                           (ug/1) 2
                                               2
       40
                    TZn
                                                      1
C----
C255 subsurface quality control
C
     (value of 0 = use constant qual-input; 1 = use corresponding monthly variable card)
C
C
               if = 1 the accumulation rate and limiting storage of QUALOF varies monthly (cards 270, 271)
С
    vaofa
               if = 1 the constituent is a QUALSURO (surface flow associated).
С
    asowfa
               if = 1 the concentration of this constituent in surface outflow varies monthly (card 272)= 1
C
    vsqcfg
read table 272
               if = 1 the constituent is a QUALIF (interflow associated).
   gifwfg
C
С
    viqcfg
               if = 1 the concentration of this constituent in interflow outflow varies monthly (card 273)=
1 read table 273
               if = 1 the constituent is a QUALGW (groundwater associated).
С
    qaqwfq
С
    vaqcfg
               if = 1 the concentration of this constituent in groundwater outflow varies monthly (card 274)
               if = 1 atmosperic deposition on land
C
    adfglnd
    maddfglnd if = 1 atmosperic dry deposition varies monthly on land (card 275)
    mawdfglnd if = 1 atmosperic wet deposition varies monthly on land (card 276)
C
c vqofg qsowfg vsqcfg qifwfg viqcfg qagwfg vaqcfg adfglnd maddfglnd mawdfglnd
    0 1 0 1 0 1 0 0
C-
C260 qual-input
    storage on surface and nonseasonal parameters
C
С
    defid parameter group id
    dwqid
           general quality id
C
    deluid landuse id
С
    sqo
           initial storage of QUALOF on surface (lb or #)
           washoff potency factor if qsdfg > 0, card 250 (lb or #)/ton-sediment
С
    potfw
    potfs scour potency pactor if qsdfg > 0, card 250 (lb or #)/ton-sediment
   potfc
           background concentration potency pactor if qsdfg > 0, card 250 (lb or #)/ton-sediment
С
    acgop
           accumulation rate of QUALOF on surface (lb or #)/acre/day
   sqolim maximum storage of QUALOF on surface (lb or #)/acre
С
           rate of surface runoff that removes 90% of stored QUALOF per hour (in/hr)
С
    soac
            concentration of constituent in surface outflow (mg/l), (ug/l), or (\#/100ml)
            concentration of constituent in interflow outflow (mg/l), (ug/l), or (\#/100ml)
С
    ioqc
           concentration of constituent in groundwater outflow (mg/1), (ug/1), or (\#/100ml)
C
    aogc
    addc
           atmospheric dry deposition flux (lb/acre/day or #/acre/day)
C
           atmospheric wet deposition concentration (mg/l), (ug/l), or (#/100ml)
    awdc
c the units of the following parameters are as follow:
c if in card 250, the unit is mg/l or ug/l, then M is lbs
c if in card 250, the unit is \#/100ml, then M is \#, in this case the unit for
c sogc, iogc and aogc should be #/100ml instead of mg/l
c defid dwqid deluid sqo potfw potfs potfc acqop sqolim wsqop soqc
                                                                                  iogc aogc addc
awdc
                    1000 0.000000 0.000000 0.000000 0.000000 0.001000
       33 3
                    0.800000 0.000000 0.000000 0.000000 0.000000 0.000000
       0.500000
                    2000 0.000000 0.000000 0.000000 0.000000 0.001000
       33 3
       0.500000
                    0.800000 0.000000 0.000000 0.000000 0.000000 0.000000
```

```
3000 0.000000 0.000000 0.000000 0.000000 0.001000
             0.500000
1.400000
              5000 0.000000 0.000000 0.000000 0.000000 0.080000

      0.600000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      6000
      0.000000
      0.000000
      0.000000
      0.000000
      0.200000

      0.800000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      7000
      0.000000
      0.000000
      0.000000
      0.100000

1.400000
33 3
             33 3
              9000 0.000000 0.000000 0.000000 0.000000 0.020000
33 3
             0.800000
33 3
0.000001
             11111 0.000000 0.000000 0.000000 0.000000 0.010000 1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
              11112 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
                                                                                    0.000000
             11121 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
11122 0.000000 0.000000 0.000000 0.000000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.0000000
11211 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
33 3
             11212 0.000000 0.000000 0.000000 0.000000 0.010000
33 3

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.0

      11221
      0.000000
      0.000000
      0.000000
      0.000000
      0.010000

0.800000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
             11222 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
11311 0.000000 0.000000 0.000000 0.000000
33 3
0.800000
              1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
                                                                                    0 000000
             11312 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
11321 0.000000 0.000000 0.000000 0.000000
33 3
             33 3
              11411 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000
             11412 0.000000 0.000000 0.000000 0.000000 0.010000 1.640000 0.000000 1.000000 0.300000 0.000000 0.
33 3
0.800000
             11421 0.000000 0.000000 0.000000 0.000000 0.010000 1.640000 0.000000 1.000000 0.300000 0.000000 0.01422 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
0.800000
                                                                                    0.000000
              1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
                                                                                    0 000000
             12111 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
12112 0.000000 0.000000 0.000000 0.000000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             12121 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
12122 0.000000 0.000000 0.000000 0.000000
33 3
             33 3
0.800000
             12212 0.000000 0.000000 0.000000 0.000000 0.010000

1.640000 0.000000 1.000000 0.300000 0.000000 0.010000

12221 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
0.800000
                                                                                    0.000000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
             0.800000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
             12312 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
              12321 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
             33 3
             12411 0.000000 0.000000 0.000000 0.000000 0.010000
33 3

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      12412
      0.000000
      0.000000
      0.000000
      0.010000

0.800000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
              12421 0.000000 0.000000 0.000000 0.000000 0.010000
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
```

```
12422 0.000000 0.000000 0.000000 0.000000 0.010000
              0.800000
8.000000
              13112 0.000000 0.000000 0.000000 1.500000
33 3

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    13121
    0.000000
    0.000000
    0.000000
    0.000000
    1.500000

    1.640000
    0.000000
    1.000000
    0.000000
    0.000000
    0.000000

    1.500000
    0.000000
    0.000000
    0.000000
    0.000000

8.000000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
13211 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
33 3
              13212 0.000000 0.000000 0.000000 0.000000 1.500000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
13221 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
8.000000
33 3
8.000000
              13222 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
8.000000
              13231 0.000000 0.000000 0.000000 1.500000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000
8.000000
                                                                                        0.000000

      13232
      0.000000
      0.000000
      0.000000
      1.500000

      1.640000
      0.000000
      1.000000
      0.000000
      0.000000

      13311
      0.000000
      0.000000
      0.000000
      1.500000

33 3
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
13312 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
33 3
              13321 0.000000 0.000000 0.000000 0.000000 1.500000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000 0.0
13322 0.000000 0.000000 0.000000 1.500000
8.000000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
8.000000
              13331 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000
13411 0.000000 0.000000 0.000000 1.500000
33 3
8.000000
              1.640000 0.000000 1.000000 0.300000 0.000000
8 000000
                                                                                        0 000000
              8.000000
33 3
              8.000000
33 3
              13431 0.000000 0.000000 0.000000 0.000000 1.500000
33 3

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    1.500000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000

33 3
8.000000

    14121
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000

    14122
    0.000000
    0.000000
    0.000000
    0.000000

33 3
0.500000
              1.640000 0.000000 1.000000 0.300000 0.000000
0 500000
                                                                                        0 000000
              33 3
0.500000
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
33 3
              14221 0.000000 0.000000 0.000000 0.000000 0.050000
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
              14222 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
              33 3
0.500000

    14232
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    14321
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

33 3
0.500000
                                                                                        0.000000
33 3
0.500000
              1.640000 0.000000 1.000000 0.300000 0.000000
              0.500000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
              14332 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
              14421 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
              33 3
0.500000
              14431 0.000000 0.000000 0.000000 0.000000 0.050000
33 3

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      14432
      0.000000
      0.000000
      0.000000
      0.050000

0.500000
33 3
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
              15121 0.000000 0.000000 0.000000 0.000000 0.050000
              1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
```

```
15122 0.000000 0.000000 0.000000 0.000000 0.050000
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
15131 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
0.500000
            15132 0.000000 0.000000 0.000000 0.000000 0.050000
33 3

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

0.500000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            15231 0.000000 0.000000 0.000000 0.000000 0.050000 1.640000 0.000000 1.000000 0.300000 0.000000 0.
33 3
0.500000
            15232 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.0000000
15321 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
33 3
0.500000
            15322 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
            15331 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000
0.500000
                                                                            0.000000
            15332 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000 0.050000
15421 0.000000 0.000000 0.000000 0.050000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.0000000
15422 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
33 3
            15431 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
            0.500000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
33 3

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1000
    0.000000
    4.462500
    4.462500
    0.000000
    0.000000

0.000001
            0.000001
                                                                            0 000000
             2000 \quad 0.000000 \quad 4.462500 \quad 4.462500 \quad 0.000000 \quad 0.000000 \\ 1.640000 \quad 0.000000 \quad 0.000000 \quad 0.000000 \quad 0.000000 
0.000001
            3000 0.000000 4.462500 4.462500 0.000000 0.000000
33 7
            0.000001
33 7
            5000 0.000000 6.825000 6.825000 0.000000 0.000000
33 7
            33 7
            0.000001
33 7
            7000 0.000000 7.350000 7.350000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    8000
    0.000000
    1.050000
    1.050000
    0.000000
    0.000000

0.000001
                                                                            0.000000
            0.000001
                                                                            0 000000
            9000 0.000000 1.050000 1.050000 0.000000 0.000000
            0.000001
            33 7
0.000001
            11111 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
            11112 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000
            11121 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.
33 7
0.000001
            11122 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.0
11211 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
0.000001
                                                                            0.000000
33 7
0.000001
            1.640000 0.000000 0.400000 0.200000 0.000000
                                                                            0.000000
            0.000001
            11221 0.000000 2.000000 2.000000 0.000000 0.000000
            1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
            11222 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
            11311 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000
            11312 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000
            11321 0.000000 2.000000 2.000000 0.000000 0.000000
33 7

      1.640000
      0.000000
      0.400000
      0.200000
      0.000000
      0.000000

      11322
      0.000000
      2.000000
      0.000000
      0.000000
      0.000000

0.000001
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
            11411 0.000000 2.000000 2.000000 0.000000 0.000000
            1.640000 \qquad 0.000000 \qquad 0.400000 \qquad 0.200000 \qquad 0.000000 \qquad 0.000000
0.000001
```

```
11412 0.000000 2.000000 2.000000 0.000000 0.000000
            0.000001
0.000001
33 7
            11422 0.000000 2.000000 2.000000 0.000000 0.000000
            1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
            12111 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
12112 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
            12121 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.
33 7
            12122 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
            12211 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
33 7
0.000001
            0.000001
            12221 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
                                                                          0.000000
            12311 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
12312 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
33 7
            12321 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
0.000001
            1.640000 0.000000 0.400000 0.200000 0.000000
            12322 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
            12411 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
12412 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
0.000001
            1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
                                                                          0 000000
            12422 0.000000 2.000000 2.000000 0.000000 0.000000
            1.640000 0.000000 0.400000 0.200000 0.000000 0.0000000
13111 0.000000 8.000000 8.000000 0.600000 0.000000
1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
33 7
            13112 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
            1.640000 0.000000 1.200000 0.600000 0.000000

      13121
      0.000000
      8.000000
      8.000000
      0.000000
      0.000000

      1.640000
      0.000000
      1.200000
      0.600000
      0.000000
      0.000000

0.000001
            13122 0.000000 8.000000 8.000000 0.000000 0.000000

1.640000 0.000000 1.200000 0.600000 0.000000 0.0

13211 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
0.000001
                                                                          0.000000
            1.640000 0.000000 1.200000 0.600000 0.000000
0.000001
                                                                          0 000000
            13221 0.000000 8.000000 8.000000 0.000000 0.000000
0.000001
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
            13222 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
            13231 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
            33 7
0.000001
            13311 0.000000 8.000000 0.000000 0.000000

1.640000 0.000000 1.200000 0.600000 0.000000 0.0

13312 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
0.000001
                                                                          0.000000
33 7
0.000001
            1.640000 0.000000 1.200000 0.600000 0.000000
            0.000001
            13322 0.000000 8.000000 8.000000 0.000000 0.000000
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
            13331 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
            13411 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
            1.640000 0.000000 1.200000 0.600000 0.000000

    13412
    0.000000
    8.000000
    8.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.200000
    0.600000
    0.000000
    0.000000

33 7
            13421 0.000000 8.000000 8.000000 0.000000 0.000000

      1.640000
      0.000000
      1.200000
      0.600000
      0.000000
      0.000000

      13422
      0.000000
      8.000000
      0.000000
      0.000000
      0.000000

0.000001
33 7
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
            13431 0.000000 8.000000 8.000000 0.000000 0.000000
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
```

```
13432 0.000000 8.000000 8.000000 0.000000 0.000000
           0.000001
0.000001
           14122 0.000000 2.000000 0.000000 0.000000
           1.640000 0.000000 0.200000 0.200000 0.000000
0.000001

    14131
    0.000000
    2.000000
    2.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.200000
    0.200000
    0.000000
    0.000000

    14132
    0.000000
    2.000000
    0.000000
    0.000000
    0.000000

33 7
           1.640000 0.000000 0.200000 0.200000 0.000000 0.000000

    14221
    0.000000
    2.000000
    2.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.200000
    0.200000
    0.000000
    0.000000

33 7
           14222 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
0.000001
           1.640000 0.000000 0.200000 0.200000 0.000000

    14231
    0.000000
    2.000000
    2.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.200000
    0.200000
    0.000000
    0.000000

33 7
0.000001
           0.000001
           14321 0.000000 2.000000 0.000000 0.000000
           1.640000 0.000000 0.200000 0.200000 0.000000
0.000001
                                                                       0.000000

      14322
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

           14331 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
           1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
14332 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
33 7
           14421 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
0.000001
           1.640000 0.000000 0.200000 0.200000 0.000000
           14422 0.000000 2.000000 0.000000 0.000000
33 7
           1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
33 7
           14431 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

      14432
      0.000000
      2.000000
      0.000000
      0.000000
      0.000000

0.000001
           1.640000 0.000000 0.200000 0.200000 0.000000
0.000001
                                                                       0 000000
           15121 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
           15122 0.000000 2.000000 2.000000 0.000000 0.000000
           0.000001
33 7
           15132 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
           1.640000 0.000000 0.200000 0.200000 0.000000
           15221 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.200000 0.200000 0.200000 0.000000 0.
0.000001
33 7
           15222 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

      15231
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

0.000001
                                                                       0.000000
           1.640000 0.000000 0.200000 0.200000 0.000000
0.000001
                                                                       0 000000
           0.000001
           15321 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
           1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
           15322 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
           1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
           15331 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
           1.640000 0.000000 0.200000 0.200000 0.000000
           15332 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.200000 0.200000 0.200000 0.000000 0.
33 7
0.000001
33 7
           15421 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

      15422
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

0.000001
                                                                       0.000000
33 7
           1.640000 0.000000 0.200000 0.200000 0.000000
0.000001
           0.000001
           15432 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
           1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
           33 7
           1000 0.000000 0.017500 0.017500 0.000000 0.000000
33 10
           0.000001
           33 10
           3000 0.000000 0.012000 0.012000 0.000000 0.000000
33 10
           0.000001
33 10
0.000001
           5000 0.000000 0.007500 0.007500 0.000000 0.000000
           0.000001
```

```
0.00000 0.00000 0.020000 0.020000 0.000000 0.000000

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    0.000000
    0.000000

    7000
    0.000000
    0.025000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
0.000001
      8000 0.000000 0.011250 0.011250 0.000000 0.000000
      0.000001
      33 10
0.000001
33 10
0.000001
      11111 0.000000 0.005000 0.005000 0.000000 0.000000 1.640000 0.000000 0.000000 0.000000 0.
33 10
      11112 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
      0.000001
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      33 10
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      11211 0.000000 0.005000 0.005000 0.000000 0.000000
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      0.000001
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      11311 0.000000 0.005000 0.005000 0.000000 0.000000
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      11312 0.000000 0.005000 0.005000 0.000000 0.000000
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      11422 0.000000 0.005000 0.005000 0.000000 0.000000
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      0.000001
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      12212 0.000000 0.005000 0.005000 0.000000 0.000000
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      12221 0.000000 0.005000 0.005000 0.000000 0.000000
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      0.000001
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      0.000001
      12321 0.000000 0.005000 0.005000 0.000000 0.000000
      0.000001
      12322 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
      0.000001
      12411 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
      0.000001
      12412 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
      0.000001

    12421
    0.000000
    0.005000
    0.005000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
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    0.000000

33 10
      12422 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
      0.000001
33 10
0.000001
      1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
      13112 0.000000 0.001000 0.001000 0.000000 0.000000
      0.000001
```

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13121 0.000000 0.001000 0.001000 0.000000 0.000000
       0.000001
0.000001
       13211 0.000000 0.001000 0.001000 0.000000 0.000000

    13212
    0.000000
    0.001000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    13212
    0.000000
    0.001000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    13212
    0.000000
    0.001000
    0.000000
    0.000000
    0.000000

0.000001
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0.000001
33 10
       0.000001
33 10
       13231 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
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0.000001
                                           0.000000
       33 10
0.000001
       13312 0.000000 0.001000 0.001000 0.000000 0.000000
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       0.000001
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       13411 0.000000 0.001000 0.001000 0.000000 0.000000
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       33 10
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33 10
       0.000001
                                           0 000000
       33 10
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33 10
       0.000001
33 10
       14122 0.000000 0.001000 0.001000 0.000000 0.000000
33 10

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.001000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
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33 10
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       14232 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
0.000001
       14321 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
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       33 10
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                                           0.000000
33 10
       0.000001
       14421 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
       14422 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
       14431 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
       14432 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
33 10
       15122 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
33 10
0.000001
       1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
       15132 0.000000 0.001000 0.001000 0.000000 0.000000
       0.000001
```

```
15221 0.000000 0.001000 0.001000 0.000000 0.000000
          0.000001
0.000001
          15231 0.000000 0.001000 0.001000 0.000000 0.000000

    15231
    0.000000
    0.001000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    15232
    0.000000
    0.001000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    15321
    0.000000
    0.001000
    0.001000
    0.000000

0.000001
33 10
0.000001
33 10

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    15322
    0.000000
    0.001000
    0.001000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
33 10
          15331 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
          0.000001
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          33 10
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          15422 0.000000 0.001000 0.001000 0.000000 0.000000
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          0.000001
                                                                 0.000000
          33 10
0.000001
33 10

      1.640000
      0.000000
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      0.000000
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      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
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      1.000
      0.000000
      1.750000
      0.000000
      0.000000
      0.000000

0.000001
33 10
33 11
          0.000001
33 11
          0.000001
                                                                0.000000
          33 11
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33 11

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      5000
      0.000000
      0.750000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      6000
      0.000000
      2.000000
      0.000000
      0.000000
      0.000000

0.000001
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33 11

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      7000
      0.000000
      2.500000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      8000
      0.000000
      1.125000
      1.125000
      0.000000
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0.000001
33 11
33 11
          0.000001
33 11
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          33 11
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          0 000000
          0.000001
33 11
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          11122 0.000000 0.500000 0.500000 0.000000 0.000000
33 11
0.000001
          11211 0.000000 0.500000 0.500000 0.000000 0.000000
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          0.000001
33 11
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33 11
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          11311 0.000000 0.500000 0.500000 0.000000 0.000000
          0.000001
          11312 0.000000 0.500000 0.500000 0.000000 0.000000
33 11
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          11321 0.000000 0.500000 0.500000 0.000000 0.000000
33 11
          11322 0.000000 0.500000 0.500000 0.000000 0.000000
33 11
          0.000001
          33 11
          11412 0.000000 0.500000 0.500000 0.000000 0.000000
33 11
          0.000001
33 11
          11422 0.000000 0.500000 0.500000 0.000000 0.000000
          0.000001
```

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12111 0.000000 0.500000 0.030000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
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    1.640000
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    0.000000
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    1.640000
    0.000000
    0.000000
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    1.640000
    0.000000
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0.000001
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         12121 0.000000 0.500000 0.030000 0.000000 0.000000
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         33 11
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33 11
         12212 0.000000 0.500000 0.0030000 0.000000 0.000000 0.000000 1.640000 0.000000 0.000000 0.000000 0.
33 11
         12221 0.000000 0.500000 0.030000 0.000000 0.000000
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        0.000001
33 11
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        0.000001
         12312 0.000000 0.500000 0.030000 0.000000 0.000000
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        33 11
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33 11
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33 11
         12412 0.000000 0.500000 0.030000 0.000000 0.000000
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        33 11
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33 11

    1.640000
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         13311 0.000000 0.100000 0.100000 0.000000 0.000000
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      1.640000
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         13411 0.000000 0.100000 0.100000 0.000000 0.000000
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         13412 0.000000 0.100000 0.100000 0.000000 0.000000
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         13421 0.000000 0.100000 0.100000 0.000000 0.000000
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         13422 0.000000 0.100000 0.100000 0.000000 0.000000
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        0.000001
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33 11
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33 11
         14122 0.000000 0.100000 0.100000 0.000000 0.000000
         1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
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14131 0.000000 0.100000 0.100000 0.000000 0.000000
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           14221 0.000000 0.100000 0.100000 0.000000 0.000000
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33 11
           14321 0.000000 0.100000 0.100000 0.000000 0.000000
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           33 11
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           14332 0.000000 0.100000 0.100000 0.000000 0.000000
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           14432 0.000000 0.100000 0.100000 0.000000 0.000000
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           33 11
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           15332 0.000000 0.100000 0.100000 0.000000 0.000000
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           15421 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
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           15422 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
           0.000001
33 11
0.000001
           33 11
0.000001
33 11
           0.000001
           1000 0.000000 0.432000 0.432000 0.000000 0.000000
33 12
           0.000001
           2000 0.000000 0.324000 0.324000 0.000000 0.000000
33 12
           0.000001
           3000 0.000000 0.108000 0.108000 0.000000 0.000000
33 12
           1.640000 50.000000 0.000000 0.000000 0.000000
0.000001
           4000 0.000000 0.432000 0.432000 0.000000 0.000000
33 12
           1.640000 50.000000 0.000000 0.000000 0.000000
0.000001

      5000
      0.000000
      0.378000
      0.378000
      0.000000
      0.000000

      1.640000
      50.000000
      0.000000
      0.000000
      0.000000
      0.000000

33 12
           6000 0.000000 0.518400 0.518400 0.000000 0.000000
33 12
           0.000001
33 12
           0.000001
           8000 0.000000 0.270000 0.270000 0.000000 0.000000
           0.000001
```

```
9000 0.000000 0.090000 0.090000 0.000000 0.000000
        0.000001
0.000001
        11111 0.000000 0.010000 0.010000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.111
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.112
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.112
      0.000000
      0.010000
      0.010000
      0.000000
      0.000000

0.000001
33 12
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33 12
        0.000001
33 12
        11211 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
33 12
0.000001
        33 12
0.000001
        11222 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
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        33 12
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33 12
        0.000001
33 12
        11322 0.000000 0.010000 0.010000 0.000000 0.000000
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        0.000001
33 12
        0.000001
        33 12
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        0.000001
                                                    0 000000
        0.000001
33 12
        0.000001
33 12
        12121 0.000000 0.010000 0.010000 0.000000 0.000000
33 12

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    12122
    0.000000
    0.010000
    0.010000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

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33 12
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        0.000001
                                                    0 000000
        0.000001
33 12
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        12311 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
        12312 0.000000 0.010000 0.010000 0.000000 0.000000
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        0.000001
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      1.640000
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      0.000000
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      0.000000

      12322
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      12411
      0.000000
      0.010000
      0.010000
      0.000000
      0.000000

33 12
0.000001
33 12
        0.000001
        12412 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
        12421 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
0.000001
        12422 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        13111 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
33 12
33 12
        0.000001
33 12
        1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
        13211 0.000000 0.010000 0.010000 0.000000 0.000000
        0.000001
```

```
13212 0.000000 0.010000 0.010000 0.000000 0.000000
        0.000001
0.000001
        13222 0.000000 0.010000 0.010000 0.000000 0.000000

      13222
      0.000000
      0.010000
      0.010000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.010000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      13232
      0.000000
      0.010000
      0.010000
      0.000000
      0.000000
      0.000000

0.000001
33 12
0.000001
33 12
        0.000001
33 12
        13312 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
33 12
0.000001
        33 12
0.000001
        13331 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
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        33 12
0.000001
33 12
        0.000001
33 12
        13422 0.000000 0.010000 0.010000 0.000000 0.000000
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        0.000001
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        0.000001
                                                 0.000000
        33 12
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33 12
        0.000001
                                                 0 000000
        0.000001
33 12
        0.000001
33 12
        14221 0.000000 0.010000 0.010000 0.000000 0.000000
33 12

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.010000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

0.000001
33 12
0.000001

    14231
    0.000000
    0.010000
    0.010000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
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    14232
    0.000000
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33 12
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33 12
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        33 12
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        14331 0.000000 0.010000 0.010000 0.000000 0.000000
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        14332 0.000000 0.010000 0.010000 0.000000 0.000000
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        0.000001
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        33 12
0.000001
33 12
        0.000001
        14432 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
        15121 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
0.000001
        15122 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        15131 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
33 12
        15221 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
33 12
        1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
        15231 0.000000 0.010000 0.010000 0.000000 0.000000
        0.000001
```

```
15232 0.000000 0.010000 0.010000 0.000000 0.000000
            0.000001
0.000001
            15322 0.000000 0.010000 0.010000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.010000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
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      1.640000
      0.000000
      0.010000
      0.000000
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0.000001
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33 12
            0.000001
33 12
            15422 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
            0.000001
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            33 12
0.000001
            33 12
            0.000001
                                                                           0.000000
            33 14
0.000001
33 14
            0.000001
33 14
            4000 0.000000 4.500000 4.500000 0.000000 0.000000
33 14
            0.000001
33 14
            0.000001

      6000
      0.000000
      5.760000
      5.760000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000

      7000
      0.000000
      11.520000
      11.520000
      0.000000
      0.000000

33 14
0.000001
33 14
            0.000001
                                                                           0 000000
            33 14
0.000001
33 14
            0.000001
33 14
            11111 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
            0.000001
33 14
0.000001
            11121 0.000000 3.600000 3.600000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000 0.0

11122 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
0.000001
33 14
            1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                           0 000000

      11211
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      11212
      0.000000
      3.600000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

33 14
0.000001
33 14
0.000001
            11221 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
            1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
            11222 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
            1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
            11311 0.000000 3.600000 3.600000 0.000000 0.000000 1.640000 0.000000 0.000000 50.000000 0.000000 0.00
33 14
0.000001
            1.312 0.000000 3.600000 3.600000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000 0.0

1.321 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
0.000001
                                                                          0.000000
33 14
            1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                           0.000000
            33 14
0.000001
            11411 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
0.000001
            1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
            11412 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
            1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
            11421 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
            1.640000 0.000000 0.000000 50.000000 0.000000
0.000001

      11422
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.00

33 14
            12111 0.000000 3.600000 3.600000 0.000000 0.000000
33 14

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    12112
    0.000000
    3.600000
    3.600000
    0.000000
    0.000000

0.000001
33 14
            1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 50.000000 \qquad 0.000000 \qquad 0.000000
0.000001
            12121 0.000000 3.600000 3.600000 0.000000 0.000000
            1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
```

```
12122 0.000000 3.600000 3.600000 0.000000 0.000000
                0.000001
0.000001
                12212 0.000000 3.600000 3.600000 0.000000 0.000000
                1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                12221 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000
12222 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
0.000001
33 14
0.000001
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000

      12311
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000

33 14
                12312 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
                0.000001
33 14
0.000001
                12322 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
33 14
0.000001
                12411 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
                1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                                                 0.000000
                12412 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000
12421 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
0.000001
33 14

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    1.642000
    0.000000
    3.600000
    3.600000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

0.000001
33 14
33 14
                0.000001
33 14

    13112
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    13121
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    13122
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

0.000001
33 14
0.000001
33 14
               0.000001
33 14
0.000001
33 14
0.000001
33 14
33 14
               0.000001
33 14
0.000001
33 14
0.000001
33 14

      13311
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

0.000001
33 14
0.000001
33 14
0.000001
33 14
                0.000001
33 14
               0.000001
33 14
0.000001
33 14
0.000001
                                                                                                 0.000000
33 14
                1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                                                 0.000000
                13422 0.000000 0.720000 0.720000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000

13431 0.000000 0.720000 0.720000 0.000000 0.000000
0.000001
33 14
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
                13432 0.000000 0.720000 0.720000 0.000000 0.000000
33 14
                33 14
                1.640000 0.000000 0.000000 50.000000 0.000000 0.0

14122 0.000000 0.720000 0.720000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000 0.0

14131 0.000000 0.720000 0.720000 0.000000 0.000000
0.000001
33 14
33 14
                0.000001
33 14
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
                14221 0.000000 0.720000 0.720000 0.000000 0.000000
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
```

```
14222 0.000000 0.720000 0.720000 0.000000 0.000000
           0.000001
0.000001
           14232 0.000000 0.720000 0.720000 0.000000 0.000000
           0.000001
33 14
0.000001
33 14

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

0.000001
33 14
0.000001
33 14
          0.000001
33 14
0.000001
33 14
0.000001
           14431 0.000000 0.720000 0.720000 0.000000 0.000000
33 14

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000

    1.5121
    0.000000
    0.720000
    0.720000
    0.000000

0.000001
33 14
0.000001
33 14

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    15122
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000

0.000001
33 14
33 14
           0.000001
33 14
           1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
           15221 0.000000 0.720000 0.720000 0.000000 0.000000
33 14

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      15222
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

0.000001
33 14
          0.000001
33 14
0.000001
33 14
0.000001
33 14
33 14
          0.000001
33 14
0.000001
33 14
0.000001
33 14
           1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                  0 000000
           33 14
0.000001
33 14
0.000001
           15432 0.000000 0.720000 0.720000 0.000000 0.000000
33 14
           1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
           33 14
           40 3
0.500000
           40 3
0.500000
                                                                  0.000000
40 3
0.500000
           4000 0.000000 0.000000 0.000000 0.000000 0.060000
           1.400000
           5000 0.000000 0.000000 0.000000 0.000000 0.080000
40 3
           1.400000
           6000 0.000000 0.000000 0.000000 0.000000 0.200000
40 3
           0.800000 0.000000 0.000000 0.000000 0.000000 0.000000
           7000 0.000000 0.000000 0.000000 0.000000 0.100000
40 3
           40 3
           9000 0.000000 0.000000 0.000000 0.000000 0.020000
40 3
           0.800000
40 3
           11111 0.000000 0.000000 0.000000 0.000000 0.010000
           1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
```

```
11112 0.000000 0.000000 0.000000 0.000000 0.010000
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
11121 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
0.800000
            11122 0.000000 0.000000 0.000000 0.000000 0.010000
40 3

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      11211
      0.000000
      0.000000
      0.000000
      0.000000
      0.010000

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      11212
      0.000000
      0.000000
      0.000000
      0.000000
      0.010000

0.800000
40 3
            40 3
            11222 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
            0.800000
40 3
0.800000
            11312 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
            11321 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
                                                                           0.000000
            11322 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000
11411 0.000000 0.000000 0.000000 0.000000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.0000000
11412 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
40 3
            11421 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
            0.800000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
            12111 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
12112 0.000000 0.000000 0.000000 0.000000
40 3
0.800000
            1.640000 0.000000 1.000000 0.300000 0.000000
0.00000
                                                                           0 000000
            12121 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000
12122 0.000000 0.000000 0.000000 0.000000
0.800000
40 3
            40 3
            12212 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
            40 3
0.800000
            12222 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.0
12311 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
0.800000
                                                                           0.000000
            1.640000 0.000000 1.000000 0.300000 0.000000
0.00000
                                                                           0 000000
            12312 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
12321 0.000000 0.000000 0.000000 0.000000
0.800000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            12322 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            12411 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
            40 3
0.800000
            12421 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.010000
12422 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
0.800000
                                                                           0.000000
40 3
0.800000
            1.640000 0.000000 1.000000 0.300000 0.000000
            8.000000
            13112 0.000000 0.000000 0.000000 0.000000 1.500000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
8.000000
            13121 0.000000 0.000000 0.000000 1.500000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            13122 0.000000 0.000000 0.000000 0.000000 1.500000
40 3
            40 3
            13212 0.000000 0.000000 0.000000 0.000000 1.500000
40 3
            8.000000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            13222 0.000000 0.000000 0.000000 0.000000 1.500000
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
8.000000
```

```
13231 0.000000 0.000000 0.000000 1.500000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    1.322
    0.000000
    0.000000
    0.000000
    0.000000
    1.500000

    1.640000
    0.000000
    0.300000
    0.000000
    0.000000

8.000000
8.000000
             13311 0.000000 0.000000 0.000000 1.500000
40 3

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      1.3312
      0.000000
      0.000000
      0.000000
      0.000000
      1.500000

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      1.500000
      0.000000
      0.000000
      0.000000
      1.500000

8.000000
40 3
             40 3
             13331 0.000000 0.000000 0.000000 0.000000 1.500000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.0000000
13411 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
8.000000
40 3
8.000000
             8.000000
             13421 0.000000 0.000000 0.000000 1.500000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000
8.000000
                                                                                 0.000000

    13422
    0.000000
    0.000000
    0.000000
    1.500000

    1.640000
    0.000000
    1.000000
    0.000000
    0.000000

    13431
    0.000000
    0.000000
    0.000000
    1.500000

40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.0000000
13432 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
40 3
             14121 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
             0.500000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000

    14131
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000

    14132
    0.000000
    0.000000
    0.000000
    0.000000

40 3
0.500000
             1.640000 0.000000 1.000000 0.300000 0.000000
0 500000
                                                                                 0 000000

    14221
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000

    14222
    0.000000
    0.000000
    0.000000
    0.050000

0.500000
40 3
             0.500000
40 3
             14232 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
             40 3
0.500000

    14322
    0.000000
    0.000000
    0.000000
    0.000000
    0.050000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.0

    14331
    0.000000
    0.000000
    0.000000
    0.000000
    0.050000

40 3
0.500000
                                                                                 0.000000
             1.640000 0.000000 1.000000 0.300000 0.000000
0 500000
                                                                                 0 000000
             0.500000
40 3
0.500000
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             14422 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             14431 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
             40 3
0.500000
             15121 0.000000 0.000000 0.000000 0.000000 0.050000

1.640000 0.000000 1.000000 0.300000 0.000000 0.0

15122 0.000000 0.000000 0.000000 0.050000
40 3
0.500000
                                                                                 0.000000
40 3
0.500000
             1.640000 0.000000 1.000000 0.300000 0.000000
                                                                                 0.000000
             0.500000
             15132 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
             15221 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             15222 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
             40 3
             15232 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
             0.500000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             15322 0.000000 0.000000 0.000000 0.000000 0.050000
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
```

```
15331 0.000000 0.000000 0.000000 0.000000 0.050000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    15332
    0.000000
    0.000000
    0.000000
    0.000000
    0.050000

    1.640000
    0.000000
    0.300000
    0.000000
    0.000000

0.500000
0.500000
           15421 0.000000 0.000000 0.000000 0.000000 0.050000
40 3

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    1.6422
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    1.643000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    1.6431
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

0.500000
0.500000
40 3
0.500000
           1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
           15432 0.000000 0.000000 0.000000 0.000000 0.050000 1.640000 0.000000 1.000000 0.300000 0.000000 0.
40 3
           40 3
0.000001
           0.000001
           0.000001
           3000 0.000000 4.462500 4.462500 0.000000 0.000000
40 7
           0.000001
                                                                    0.000000
           4000 0.000000 7.350000 7.350000 0.000000 0.000000
           0.000001
           5000 0.000000 6.825000 6.825000 0.000000 0.000000
40 7
           0.000001
40 7
           7000 0.000000 7.350000 7.350000 0.000000 0.000000
40 7
0.000001
           8000 0.000000 1.050000 1.050000 0.000000 0.000000
40 7
           0.000001
           9000 0.000000 1.050000 1.050000 0.000000 0.000000
           0.000001
           1.640000 0.400000 0.000000 0.000000 0.000000
0 000001
                                                                    0 000000
           0.000001
           11112 0.000000 2.000000 2.000000 0.000000 0.000000
           0.000001
40 7
           11122 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000
           11211 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.
0.000001
           11212 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.0
11221 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
0.000001
                                                                    0.000000
           1.640000 0.000000 0.400000 0.200000 0.000000
0 000001
                                                                    0 000000
           11222 0.000000 2.000000 2.000000 0.000000 0.000000
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
           11311 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
           11312 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
           11321 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000
           11322 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.0
40 7
0.000001
40 7
           11411 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.400000
      0.200000
      0.000000
      0.0

      11412
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

0.000001
                                                                    0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000
                                                                    0.000000
0.000001
           11421 0.000000 2.000000 0.000000 0.000000
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
           11422 0.000000 2.000000 2.000000 0.000000 0.000000
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
           12111 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
           12112 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000
           12121 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000
           12122 0.000000 2.000000 2.000000 0.000000 0.000000
40 7

      1.640000
      0.000000
      0.400000
      0.200000
      0.000000
      0.000000

      12211
      0.000000
      2.000000
      0.000000
      0.000000
      0.000000

0.000001
40 7
           1.640000 \qquad 0.000000 \qquad 0.400000 \qquad 0.200000 \qquad 0.000000 \qquad 0.000000
           12212 0.000000 2.000000 0.000000 0.000000
           1.640000 \qquad 0.000000 \qquad 0.400000 \qquad 0.200000 \qquad 0.000000 \qquad 0.000000
0.000001
```

```
12221 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.400000
      0.200000
      0.000000
      0.000000

      1.2222
      0.000000
      2.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.200000
      0.000000
      0.000000

0.000001
0.000001
40 7
              12311 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
              1.640000 0.000000 0.400000 0.200000 0.000000
              12312 0.000000 2.000000 2.000000 0.000000 0.0000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.000000 12321 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
40 7
0.000001
              1.640000 0.000000 0.400000 0.200000 0.000000 0.000000

      12322
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.400000
      0.200000
      0.000000
      0.

40 7
              12411 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
              1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
              12412 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
              0.000001
              12422 0.000000 2.000000 2.000000 0.000000 0.000000
              1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
                                                                                        0.000000
              13112 0.000000 8.000000 8.000000 0.000000 0.000000
              1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
13121 0.000000 8.000000 8.000000 0.000000 0.000000
1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
40 7
              13122 0.000000 8.000000 8.000000 0.000000 0.000000
40 7
0.000001
              1.640000 0.000000 1.200000 0.600000 0.000000
              13211 0.000000 8.000000 8.000000 0.000000 0.000000
40 7
              1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001

    13212
    0.000000
    8.000000
    8.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.200000
    0.600000
    0.000000
    0.000000

    13212
    0.000000
    8.000000
    0.000000
    0.000000
    0.000000

0.000001
              1.640000 0.000000 1.200000 0.600000 0.000000
0 000001
                                                                                         0 000000

    13222
    0.000000
    8.000000
    8.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.200000
    0.600000
    0.000000
    0.000000

    13231
    0.000000
    8.000000
    0.000000
    0.000000

0.000001
40 7
              1.640000 0.000000 1.200000 0.600000 0.000000 0.0000000
13232 0.000000 8.000000 8.000000 0.600000 0.000000
1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
40 7
              13311 0.000000 8.000000 8.000000 0.000000 0.000000
40 7
              0.000001
              13321 0.000000 8.000000 0.000000 0.000000
1.640000 0.000000 1.200000 0.600000 0.000000 0.0
13322 0.000000 8.000000 8.000000 0.000000 0.000000
0.000001
                                                                                        0.000000
              1.640000 0.000000 1.200000 0.600000 0.000000
0 000001
                                                                                         0 000000
              13331 0.000000 8.000000 8.000000 0.000000 0.000000
              1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
              13411 0.000000 8.000000 8.000000 0.000000 0.000000
0.000001
              1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
              13412 0.000000 8.000000 8.000000 0.000000 0.000000
40 7
              1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
              13421 0.000000 8.000000 8.000000 0.000000 0.000000
40 7
              1.640000 0.000000 1.200000 0.600000 0.000000

      13422
      0.000000
      8.000000
      8.000000
      0.000000
      0.000000

      1.640000
      0.000000
      1.200000
      0.600000
      0.000000
      0.0

40 7
0.000001

    13431
    0.000000
    8.000000
    8.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.200000
    0.600000
    0.000000
    0.000000

    13432
    0.000000
    8.000000
    0.000000
    0.000000

40 7
0.000001
                                                                                        0.000000
40 7
              1.640000 0.000000 1.200000 0.600000 0.000000
                                                                                         0.000000
0.000001
              0.000001
              14122 0.000000 2.000000 2.000000 0.000000 0.000000
              1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
              14131 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
              1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
              14132 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
              1.640000 0.000000 0.200000 0.200000 0.000000
              14221 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
              1.640000 0.000000 0.200000 0.200000 0.000000
              14222 0.000000 2.000000 2.000000 0.000000 0.000000
40 7

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

      14231
      0.000000
      2.000000
      0.000000
      0.000000
      0.000000

0.000001
40 7
              1.640000 \qquad 0.000000 \qquad 0.200000 \qquad 0.200000 \qquad 0.000000 \qquad 0.000000
              14232 0.000000 2.000000 2.000000 0.000000 0.000000
              1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
```

```
14321 0.000000 2.000000 2.000000 0.000000 0.000000
         0.000001
0.000001
         14331 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
         1.640000 0.000000 0.200000 0.200000 0.000000
         14421 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000

      14422
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

40 7
         14431 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
0.000001
         1.640000 0.000000 0.200000 0.200000 0.000000
         14432 0.000000 2.000000 2.000000 0.000000 0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
         0.000001
         15122 0.000000 2.000000 0.000000 0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000
0.000001
                                                         0.000000
         15131 0.000000 2.000000 2.000000 0.000000 0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
         15132 0.000000 2.000000 2.000000 0.000000 0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
15221 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
40 7
         15222 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
0.000001
         1.640000 0.000000 0.200000 0.200000 0.000000
         15231 0.000000 2.000000 0.000000 0.000000
40 7
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
         15232 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

      15321
      0.000000
      2.000000
      0.000000
      0.000000
      0.000000

0.000001
         1.640000 0.000000 0.200000 0.200000 0.000000
0 000001
                                                         0 000000
         15322 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
         15331 0.000000 2.000000 2.000000 0.000000 0.000000
         0.000001
40 7
         15421 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
         1.640000 0.000000 0.200000 0.200000 0.000000
         15422 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.200000 0.200000 0.200000 0.000000 0.
0.000001
         15431 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

      1.5432
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

0.000001
                                                         0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000
0.000001
                                                         0 000000
         0.000001
         1000 0.000000 0.017500 0.017500 0.000000 0.000000
40 10
0.000001
         2000 0.000000 0.015000 0.015000 0.000000 0.000000
40 10
0.000001
         3000 0.000000 0.012000 0.012000 0.000000 0.000000
40 10
         0.000001
         40 10
0.000001
40 10
         5000 0.000000 0.007500 0.007500 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    6000
    0.000000
    0.020000
    0.020000
    0.000000
    0.000000

0.000001
                                                         0.000000
40 10
         0.000001
         7000 0.000000 0.025000 0.025000 0.000000 0.000000
40 10
         0.000001
         8000 0.000000 0.011250 0.011250 0.000000 0.000000
40 10
         0.000001
40 10
         9000 0.000000 0.003750 0.003750 0.000000 0.000000
         0.000001
         40 10
         1.640000 0.100000 0.000000 0.000000 0.000000
0.000001
         40 10
         11112 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
         0.000001
40 10
0.000001
         1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
         11122 0.000000 0.005000 0.005000 0.000000 0.000000
         0.000001
```

```
11211 0.000000 0.005000 0.005000 0.000000 0.000000
     0.000001
0.000001
     11221 0.000000 0.005000 0.005000 0.000000 0.000000
     0.000001
40 10
0.000001
40 10
0.000001
     11312 0.000000 0.005000 0.005000 0.000000 0.000000 1.640000 0.000000 0.000000 0.000000 0.
40 10
     11321 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
0.000001
     40 10
0.000001
     40 10
0.000001
40 10
     11412 0.000000 0.005000 0.005000 0.000000 0.000000
     0.000001
                                 0.000000
     40 10
0.000001
     11422 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
     0.000001
40 10
     12112 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
0.000001
     12121 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
     0.000001
     40 10
0.000001
40 10
     0.000001
                                 0 000000
     40 10
0.000001
40 10
     0.000001
40 10
     12311 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
     0.000001

      12312
      0.000000
      0.005000
      0.005000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000

40 10
0.000001
     40 10
0.000001
                                 0.000000
40 10
     0.000001
                                 0 000000
     40 10
0.000001
40 10
0.000001
     40 10
     12421 0.000000 0.005000 0.005000 0.000000 0.000000
0.000001
     12422 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
     0.000001
40 10
0.000001
     40 10
0.000001
                                 0.000000
40 10
     0.000001
     13122 0.000000 0.001000 0.001000 0.000000 0.000000
     0.000001
     13211 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
     0.000001
40 10
     13212 0.000000 0.001000 0.001000 0.000000 0.000000
     13221 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
     0.000001
40 10
     13231 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
     0.000001
40 10
     1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
     13311 0.000000 0.001000 0.001000 0.000000 0.000000
     0.000001
```

```
13312 0.000000 0.001000 0.001000 0.000000 0.000000
          0.000001
0.000001
          13322 0.000000 0.001000 0.001000 0.000000 0.000000
          0.000001
          40 10
0.000001
40 10
          0.000001
40 10
          13421 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
          0.000001
40 10
          0.000001
          40 10
0.000001
          13432 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
0.000001
          0.000000
          40 10
0.000001
          14122 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
          0.000001
40 10
          14132 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
          0.000001
40 10
          0.000001
                                                               0.000000
40 10
          14222 0.000000 0.001000 0.001000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    1.221
    0.000000
    0.001000
    0.000000
    0.000000
    0.000000

0.000001
                                                               0.000000
40 10
          0 000001
                                                               0 000000
          40 10
0.000001
          14321 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
          0.000001
40 10
          14331 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
          0.000001

      14332
      0.000000
      0.001000
      0.001000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000

40 10
0.000001
40 10
          14421 0.000000 0.001000 0.001000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
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      0.000000
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0.000001
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40 10
          0.000001
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          40 10
0.000001
          14432 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
0.000001
          40 10
          15121 0.000000 0.001000 0.001000 0.000000 0.000000
0.000001
          15122 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
          0.000001
40 10
0.000001
40 10
          15132 0.000000 0.001000 0.001000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.5221
    0.000000
    0.001000
    0.001000
    0.000000

0.000001
                                                               0.000000
40 10
          0.000001
          15222 0.000000 0.001000 0.001000 0.000000 0.000000
          0.000001
          15231 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
          0.000001
40 10
          15232 0.000000 0.001000 0.001000 0.000000 0.000000
          15321 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
          0.000001
          40 10
          15331 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
          0.000001
40 10
          1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
          15421 0.000000 0.001000 0.001000 0.000000 0.000000
          1.640000 0.000000 0.000000 0.000000 0.000000 0.000000
0.000001
```

```
15422 0.000000 0.001000 0.001000 0.000000 0.000000
         0.000001
0.000001
          15432 0.000000 0.001000 0.001000 0.000000 0.000000

      15432
      0.00000
      0.00000
      0.00000
      0.00000
      0.00000
      0.00000
      0.00000
      0.00000
      0.00000
      0.000000
      0.000000
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      0.000000
      0.000000</
0.000001
40 10
0.000001
40 11
0.000001
          40 11
40 11
          0.000001
40 11
0.000001
          0.000001
          6000 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
          0.000000
          40 11
          8000 0.000000 1.125000 1.125000 0.000000 0.000000
40 11

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    9000
    0.000000
    0.375000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000

0.000001
40 11
          40 11
0.000001
          1.640000 25.000000 0.000000 0.000000 0.000000
          11111 0.000000 0.500000 0.500000 0.000000 0.000000
40 11
          0.000001
          40 11
0.000001
40 11
0.000001
          0 000000
          0.000001
40 11
          0.000001
40 11
          11221 0.000000 0.500000 0.500000 0.000000 0.000000
40 11
          0.000001
40 11
0.000001
          40 11
0.000001
40 11
0.000001
          0 000000
          0.000001
40 11
0.000001
          11411 0.000000 0.500000 0.500000 0.000000 0.000000
40 11
0.000001
          11412 0.000000 0.500000 0.500000 0.000000 0.000000
40 11
          0.000001
40 11
          40 11
0.000001
40 11
0.000001
          12112 0.000000 0.500000 0.030000 0.000000 0.000000
          0.000001
          12121 0.000000 0.500000 0.030000 0.000000 0.000000
40 11
0.000001
          40 11
          12122 0.000000 0.500000 0.030000 0.000000 0.000000
          12211 0.000000 0.500000 0.030000 0.000000 0.000000
40 11
          0.000001

    12212
    0.000000
    0.500000
    0.030000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

40 11
          12221 0.000000 0.500000 0.030000 0.000000 0.000000
40 11
          0.000001
40 11
          1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
          12311 0.000000 0.500000 0.030000 0.000000 0.000000
          0.000001
```

```
12312 0.000000 0.500000 0.030000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.500000
      0.030000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

0.000001
0.000001
      12322 0.000000 0.500000 0.030000 0.000000 0.000000
      0.000001
      40 11
40 11
      40 11
      12422 0.000000 0.500000 0.030000 0.000000 0.000000
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      40 11
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      0.000001
      13121 0.000000 0.100000 0.100000 0.000000 0.000000
      0.000001
                                     0.000000
      40 11
      0.000001
40 11
      13221 0.000000 0.100000 0.100000 0.000000 0.000000
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      0.000001
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      0.000001
                                     0.000000
      40 11
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      0 000000
      0.000001
40 11
      0.000001
40 11
      13322 0.000000 0.100000 0.100000 0.000000 0.000000
40 11

    1.640000
    0.000000
    0.000000
    0.000000
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    13331
    0.000000
    0.100000
    0.000000
    0.000000

    1.640000
    0.000000
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      40 11
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      0 000000
      0.000001
      13422 0.000000 0.100000 0.100000 0.000000 0.000000
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0.000001
      13431 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
0.000001
      13432 0.000000 0.100000 0.100000 0.000000 0.000000
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      0.000001
40 11
      40 11
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0.000001
      14132 0.000000 0.100000 0.100000 0.000000 0.000000
      0.000001
      14221 0.000000 0.100000 0.100000 0.000000 0.000000
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0.000001
      40 11
      14222 0.000000 0.100000 0.100000 0.000000 0.000000
      14231 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
      0.000001
40 11
40 11
      0.000001
40 11
      1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
      14331 0.000000 0.100000 0.100000 0.000000 0.000000
      1.640000 0.000000 0.000000 0.000000 0.000000 0.000000
0.000001
```

```
14332 0.000000 0.100000 0.100000 0.000000 0.000000

    1432
    0.10000
    0.10000
    0.10000
    0.00000
    0.00000

    1.64000
    0.00000
    0.10000
    0.00000
    0.00000
    0.00000

    1.64000
    0.00000
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    0.00000
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    1.64000
    0.00000
    0.00000
    0.00000
    0.00000
    0.00000

0.000001
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       14422 0.000000 0.100000 0.100000 0.000000 0.000000
       0.000001
       40 11
40 11
       40 11
       15122 0.000000 0.100000 0.100000 0.000000 0.000000
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0.000001
       40 11
0.000001
       40 11
0.000001
       15221 0.000000 0.100000 0.100000 0.000000 0.000000
       0.000001
                                              0.000000
       40 11
40 11
       0.000001
40 11
       15321 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
       0.000001
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       0.000001
                                              0.000000
       40 11
0.000001
40 11
0.000001
       0 000000
       0.000001
       15422 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
       0.000001
40 11
       15432 0.000000 0.100000 0.100000 0.000000 0.000000
40 11

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      16000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

0.000001
40 11
0.000001
       40 12
0.000001
40 12
       0.000001
                                              0 000000
       3000 0.000000 0.108000 0.108000 0.000000 0.000000
       0.000001
       4000 0.000000 0.432000 0.432000 0.000000 0.000000
40 12
0.000001
       5000 0.000000 0.378000 0.378000 0.000000 0.000000
40 12
0.000001
       6000 0.000000 0.518400 0.518400 0.000000 0.000000
40 12
       0.000001
       7000 0.000000 0.691200 0.691200 0.000000 0.000000
1.640000 0.000000 0.270000 0.270000 0.000000 0.000000 0.000000
40 12
0.000001
40 12

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      9000
      0.000000
      0.090000
      0.090000
      0.000000
      0.000000

0.000001
                                              0.000000
40 12
       0.000001
       40 12
       0.000001
       11111 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
0.000001
       11112 0.000000 0.010000 0.010000 0.000000 0.000000
       11121 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
       0.000001
40 12
       11211 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
       0.000001
40 12
       1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
       11221 0.000000 0.010000 0.010000 0.000000 0.000000
       1.640000 0.000000 0.000000 0.000000 0.000000 0.000000
0.000001
```

```
11222 0.000000 0.010000 0.010000 0.000000 0.000000
      0.000001
0.000001
      11312 0.000000 0.010000 0.010000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.010000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.322
      0.000000
      0.010000
      0.010000
      0.000000
      0.000000
      0.000000

0.000001
40 12
0.000001
40 12
      0.000001
40 12
      11412 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
      0.000001
40 12
0.000001
      40 12
0.000001
      12111 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
      0.000001
                                     0.000000
      40 12
0.000001
40 12
      0.000001
40 12
      12211 0.000000 0.010000 0.010000 0.000000 0.000000
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      0.000001
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      0.000001
      40 12
0.000001
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      0.000001
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40 12
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      12322 0.000000 0.010000 0.010000 0.000000 0.000000
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40 12
0.000001
      40 12
      13112 0.000000 0.010000 0.010000 0.000000 0.000000
0.000001
      13121 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
      0.000001
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      40 12
0.000001
                                     0.000000
40 12
      0.000001
      13221 0.000000 0.010000 0.010000 0.000000 0.000000
      0.000001
      13222 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
0.000001
      40 12
      13231 0.000000 0.010000 0.010000 0.000000 0.000000
      13232 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
      0.000001
40 12
      13312 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
      0.000001
40 12
      1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
      13322 0.000000 0.010000 0.010000 0.000000 0.000000
      0.000001
```

```
13331 0.000000 0.010000 0.010000 0.000000 0.000000
      0.000001
0.000001
      13412 0.000000 0.010000 0.010000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.010000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

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40 12
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40 12
      0.000001
40 12
      13432 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
      0.000001
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0.000001
      40 12
0.000001
      14131 0.000000 0.010000 0.010000 0.000000 0.000000
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      0.000001
                                    0.000000
      40 12
0.000001
40 12
      0.000001
40 12
      14231 0.000000 0.010000 0.010000 0.000000 0.000000
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      0.000001
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      0.000001
                                    0.000000
      40 12
0.000001
40 12
      0.000001
                                    0 000000
      0.000001
40 12
      0.000001
40 12
      14422 0.000000 0.010000 0.010000 0.000000 0.000000
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      0.000001
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      0.000001
      40 12
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      0.000001
                                    0 000000
      0.000001
      15131 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
0.000001
      40 12
      15132 0.000000 0.010000 0.010000 0.000000 0.000000
0.000001
      15221 0.000000 0.010000 0.010000 0.000000 0.000000
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      0.000001
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      40 12
0.000001
                                    0.000000
40 12
      0.000001
      15321 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
      0.000001
      15322 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
0.000001
      40 12
      15331 0.000000 0.010000 0.010000 0.000000 0.000000
      15332 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
      0.000001
40 12
      15422 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
      0.000001
40 12
      1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
      15432 0.000000 0.010000 0.010000 0.000000 0.000000
      1.640000 0.000000 0.000000 0.000000 0.000000 0.000000
0.000001
```

```
16000 0.000000 0.000000 0.000000 0.000000
0.000001
               0.000001
               2000 0.000000 6.912000 6.912000 0.000000 0.000000
               0.000001
               40 14
0.000001
40 14

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      5000
      0.000000
      2.700000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      6000
      0.000000
      5.760000
      0.000000
      0.000000
      0.000000

0.000001
40 14
40 14
               0.000001
40 14
0.000001
               40 14
0.000001
               9000 0.000000 5.400000 5.400000 0.000000 0.000000
40 14
               0.000001
                                                                                             0.000000
               40 14
0.000001
40 14
               1.640000 0.000000 0.000000 50.000000 0.000000 0.0000000 11112 0.000000 3.600000 3.600000 0.000000 0.000000 0.000000 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
40 14
               11121 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
               0.000001
40 14
               1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001

    11211
    0.000000
    3.600000
    3.600000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    11212
    0.000000
    3.600000
    0.000000
    0.000000
    0.000000

40 14
0.000001
40 14
               1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                                             0 000000

      1.640000
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      3.600000
      50.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      3.600000
      50.000000
      0.000000
      0.000000

      1.640000
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000

      1.640000
      0.000000
      3.600000
      50.000000
      0.000000
      0.000000

      11312
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000
      0.000000

      11640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

40 14
0.000001
40 14
0.000001
40 14
40 14
               0.000001
40 14
0.000001
               1.322 0.000000 3.600000 3.600000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000 0.0

1.411 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
0.000001
                                                                                             0.000000
40 14
               1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                                             0 000000

      1.412
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      11421
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

40 14
0.000001
40 14
0.000001
40 14
               11422 0.000000 3.600000 3.600000 0.000000 0.000000
               1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
               12111 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
               1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
               12112 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000 0.0
40 14
0.000001
               12121 0.000000 3.600000 3.600000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000 0.0

12122 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
0.000001
                                                                                             0.000000
40 14
0.000001
               1.640000 0.000000 0.000000 50.000000 0.000000
                                                                                             0.000000
               0.000001
               12212 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
0.000001
               1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
40 14
               12221 0.000000 3.600000 3.600000 0.000000 0.000000
               1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
               12222 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
               1.640000 0.000000 0.000000 50.000000 0.000000
0.000001

      12311
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.0

40 14
               12312 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
               0.000001
40 14
               1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 50.000000 \qquad 0.000000 \qquad 0.000000
               12322 0.000000 3.600000 3.600000 0.000000 0.000000
               1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
```

```
12411 0.000000 3.600000 3.600000 0.000000 0.000000
              0.000001
0.000001
               12421 0.000000 3.600000 3.600000 0.000000 0.000000
               1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
              12422 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000
13111 0.000000 0.720000 0.720000 0.000000 0.000000
40 14
0.000001
40 14

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000

0.000001
40 14
40 14
              0.000001
40 14
0.000001
40 14
0.000001
               13212 0.000000 0.720000 0.720000 0.000000 0.000000
40 14

    13212
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    13222
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

0.000001
40 14
0.000001
40 14

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      1.222
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

0.000001
40 14
40 14
              0.000001
40 14
               1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
              1.3412 0.000000 0.720000 0.720000 0.000000 0.000000
1.640000 0.000000 0.720000 50.000000 0.000000
13321 0.000000 0.720000 0.720000 0.000000 0.000000
40 14
0.000001
40 14
              0.000001
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0.000001
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              0.000001
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0.000001
40 14
0.000001
40 14
               40 14
              0.000001
40 14
0.000001
40 14
0.000001
                                                                                          0.000000
40 14
0.000001
               1.640000 0.000000 0.000000 50.000000 0.000000
               14231 0.000000 0.720000 0.720000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      14232
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

0.000001
40 14
               1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
40 14
               14321 0.000000 0.720000 0.720000 0.000000 0.000000
               40 14
              1.640000 0.000000 0.000000 50.000000 0.000000 0.0
14331 0.000000 0.720000 0.720000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000 0.0
14332 0.000000 0.720000 0.720000 0.000000 0.000000
0.000001
40 14
40 14
              0.000001
40 14
               1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
               14422 0.000000 0.720000 0.720000 0.000000 0.000000
              1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
```

```
      40
      14
      14431
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000

      0.000001
      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      40
      14
      14432
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000

                 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
      0.000001
                 15121 0.000000 0.720000 0.720000 0.000000 0.000000
      40 14
      0.000001
                   1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
                   15122 0.000000 0.720000 0.720000 0.000000 0.000000
                   1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
      0.000001
                   15131 0.000000 0.720000 0.720000 0.000000 0.000000
      40 14
                   1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
      0.000001
      40 14
                   15132 0.000000 0.720000 0.720000 0.000000 0.000000
                   1.640000 0.000000 0.000000 50.000000 0.000000
                   15221 0.000000 0.720000 0.720000 0.000000 0.000000
      40 14
      0.000001
                   1.640000 0.000000 0.000000 50.000000 0.000000
                  15222 0.000000 0.720000 0.720000 0.000000 0.000000
      40 14
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
      0.000001
      40 14
                   15231 0.000000 0.720000 0.720000 0.000000 0.000000
                   1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
      0.000001
                   15232 0.000000 0.720000 0.720000 0.000000 0.000000
      40 14
                   1.640000 0.000000 0.000000 50.000000 0.000000
      0.000001
                                                                                     0.000000
                   15321 0.000000 0.720000 0.720000 0.000000 0.000000
                   1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
      0.000001
                  15322 0.000000 0.720000 0.720000 0.000000 0.000000
      40 14
                   1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
      0.000001
                 1.640000 0.000000 0.000000 50.000000 0.000000
15331 0.000000 0.720000 0.720000 0.000000 0.000000
      40 14
                 1.640000 0.000000 0.000000 50.000000 0.000000
                40 14
      0.000001
                   1.640000 0.000000 0.000000 50.000000 0.000000
                15421 0.000000 0.720000 0.720000 0.000000 0.000000 1.640000 0.000000 0.000000 50.000000 0.000000 0.
      40 14
      0.000001
                                                                                     0.000000

      40
      14
      16000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      0.000001
      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

C-----
c270 mon-accumulation rate (monaccum)
  only required if vqofg =1 (see card 255)
  defid parameter group id
 dwqid general quality id
    deluid landuse id
    jan-dec accumulation rate at start of each month (lb/acre/day)
c if in card 250, the unit is #/100ml, the above unit should be #/acre/day
c defid dwqid \, deluid \, jan \, feb \, mar \, apr \, may \, jun \, jul \, aug \, sep \, oct \, nov
                                                                               dec
C-----
c271 mon-storage limit of quality constituent (monsqolim)
c only required if vqofg = 1 (see card 255)
 defid parameter group id
 dwqid general quality id
  deluid landuse id
    jan-dec maximum storage at start of each month (lb/acre)
c if in card 250, the unit is \#/100ml, the above unit should be \#/acre
c defid dwqid deluid jan feb mar apr may jun jul aug sep oct nov
C-----
c272 mon-surfaceflow concentration (monsuroconc)
   only required if vsqcfg = 1 (see card 255)
    defid parameter group id
    dwqid general quality id deluid landuse id
    jan-dec concentration of constituent in surface flow at start of each month (mg/l), (ug/l), or (#/100ml)
c if in card 250, the unit is #/100ml, the above unit should be #/100ml
c defid dwqid \, deluid \, jan \, feb \, mar \, apr \, may \, jun \, jul \, aug \, sep \, oct \, nov \,
                                                                               dec
c273 mon-interflow concentration (moninterconc)
   only required if viqcfg = 1 (see card 255)
    defid parameter group id dwqid general quality id deluid landuse id
    jan-dec concentration of constituent in interflow at start of each month (mg/l), (ug/l), or (#/100ml)
```

C

С

C

С

C

C

C

C

C

C

C С

```
c if in card 250, the unit is #/100ml, the above unit should be #/100ml
c defid dwgid deluid jan feb mar apr may jun jul aug sep oct nov
C-----
c274 mon-groundwater concentration (mongrndconc)
C
   only required if vaqcfg = 1 (see card 255)
С
  defid parameter group id
C
c dwqid general quality id c deluid landuse id
C
    jan-dec concentration of constituent in groundwater at start of each month (mg/l), (ug/l), or (#/100ml)
C
c if in card 250, the unit is #/100ml, the above unit should be #/100ml
C
c defid dwqid deluid jan feb mar apr may jun jul aug sep oct nov
C-----
c275 mon-atmospheric dry deposition flux
C
   only required if maddfglnd = 1 (see card 255)
C
  defid parameter group id
C
c dwqid general quality id
c deluid landuse id
   jan-dec flux of constituent in dry deposition at start of each month (lb/acre/day or #/acre/day)
C
c defid dwqid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c276 mon-atmospheric wet deposition concentration
  only required if mawdfglnd = 1 (see card 255)
C
C
  defid parameter group id
C
c dwqid general quality id
c deluid landuse id
C
   jan-dec concentration of constituent in atmospheric wet deposition at start of each month (mg/l), (ug/l),
C
or (#/100ml)
С
c defid dwqid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
                           C280 stream water quality control
C
С
              if = 1 atmosperic deposition on reach (0 for no atmospheric deposition)
   maddfgrch if = 1 atmosperic dry deposition varies monthly on reach (card 282)
C
  mawdfgrch if = 1 atmosperic wet deposition varies monthly on reach (card 283)
C
C
c adfgrch maddfgrch mawdfgrch
 0 0 0
C---
c281 general quality constituent control
C
    rgid stream parameter group id
dwqid general quality id
qsdfg if = 0 no sediment associated qual
С
С
C
     if = 1 sediment associated in stream, adsorption/desorption of qual is simulated
    iniCond initial instream concentration at start of simulation by group (mg/1), (ug/1), or (\#/100ml)
C
           general first-order instream loss rate of qual by reach group (1/day)
С
   tcdecay temperature correction coefficient for first-order decay of qual (min=1, max=2)
C
   addc atmospheric dry deposition flux (lb/acre/day or #/acre/day)
C
            atmospheric wet deposition concentration (mg/l), (ug/l), or (#/100ml)
C
    potber scour potency pactor for stream bank erosion (lb or #)/ton-sediment
С
c rgid dwqid qsdfg iniCond decay tcdecay addc awdc potber 33 0 0.000000 0.300000 1.000000
                                                 1.000000 0.000000
                                                                               0.000000
      0.000000
      33 7
                   0
                          0.000000
                                       0.100000
                                                      1.000000
                                                                  0.000000
                                                                                 0.000000
      0.000000
                          0.000000
                                       0.100000
                                                                   0.000000
      33 10
                  0
                                                      1.000000
                                                                                 0.000000
      0.000000
      33 11
                  0
                          0.000000
                                       0.100000
                                                      1.000000
                                                                   0.000000
                                                                                 0.000000
      0.000000
      33 12
                          0.000000
                                       0.100000
                                                      1.000000
                                                                   0.000000
                                                                                 0.000000
      0.000000
      33 14
                    0
                          0.000000
                                        0.100000
                                                      1.000000
                                                                   0.000000
                                                                                 0.000000
      0.000000
                   0
                           0.000000
                                        0.100000
                                                      1.000000
                                                                   0.000000
                                                                                 0.000000
       40 3
      0.000000
                                                                   0.000000
      40 7
                    Ω
                           0.000000
                                        0.100000
                                                      1.000000
                                                                                 0.000000
      0.000000
                                                                   0.000000
       40 10
                  Ο
                          0.000000
                                       0.100000
                                                      1.000000
                                                                                 0.000000
       0.000000
       40 11
                                                                   0.000000
                  0
                          0.000000
                                       0.100000
                                                      1.000000
                                                                                 0.000000
       0.000000
```

```
0.000000
                                                  0.100000
                                                                   1.000000
                                                                                    0.000000
                                                                                                      0.000000
        0.000000
                                                  0.100000
                                                                   1.000000
        40 14
                                 0.000000
                                                                                    0.000000
                                                                                                      0.000000
        0.000000
C------
c282 mon-atmospheric dry deposition flux
     only required if maddfgrch = 1 (see card 280)
C
     rgid reach group id dwqid general quality id
С
     jan-dec flux of constituent in dry deposition at start of each month (lb/acre/day or #/acre/day)
С
c rgid dwqid jan feb mar apr may jun jul aug sep oct nov dec
c283 mon-atmospheric wet deposition concentration
    only required if mawdfgrch = 1 (see card 280)
C
С
     rgid
            reach group id
     dwqid general quality id
C
C
     jan-dec concentration of constituent in atmospheric wet deposition at start of each month (mg/l), (ug/l),
or (#/100ml)
C
c rgid dwqid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c285 parameters for decay of contaminant adsorbed to sediment
     only required if gsdfg > 0 (see card 281)
C
C
                reach group id
C
                general quality id
     dwaid
С
     addcpml decay rate for qual adsorbed to suspended sediment (/day)
С
С
     addcpm2 temperature correction coefficient for decay of qual on suspended sediment (range from 1.0 to
2.0)
     addcpm3 decay rate for qual adsorbed to bed sediment (/day)
С
     addcpm4 temperature correction coefficient for decay of qual on bed sediment (range from 1.0 to 2.0)
С
С
    rgid dwqid addcpm1 addcpm2 addcpm3 addcpm4
С
        33 3 0.000000 1.000000 0.000000
                                                                           1.000000

        7
        0.000000
        1.000000
        0.000000
        1.000000

        10
        0.000000
        1.000000
        0.000000
        1.000000

        11
        0.000000
        1.000000
        0.000000
        1.000000

        12
        0.000000
        1.000000
        0.000000
        1.000000

        14
        0.000000
        1.000000
        0.000000
        1.000000

        7
        0.000000
        1.000000
        0.000000
        1.000000

        10
        0.000000
        1.000000
        0.000000
        1.000000

        11
        0.000000
        1.000000
        0.000000
        1.000000

        12
        0.000000
        1.000000
        0.000000
        1.000000

        14
        0.000000
        1.000000
        0.000000
        1.000000

        33
                7
                         0.000000
                                          1.000000
                                                           0.000000
                                                                            1.000000
        33
        33
        33
33
        40
        40
        40
40
        40
        40
c286 adsorption coefficients of qual
    only required if qsdfg > 0 (see card 281)
C
    rgid reach group id dwqid general quality id
С
С
    {\tt adpml} \qquad {\tt distribution} \ {\tt coefficients} \ {\tt for} \ {\tt qual} \ {\tt with} \ {\tt suspended} \ {\tt sand} \ ({\tt l/mg})
С
                distribution coefficients for qual with suspended silt (1/mg)
С
    adpm3
                distribution coefficients for qual with suspended clay (1/mg)
С
    adpm4 distribution coefficients for qual with bed sand (1/mg)
С
    adpm5
              distribution coefficients for qual with bed silt (1/mg)
C
С
     adpm6
                distribution coefficients for qual with bed clay (1/mg)
C
    rgid dwqid adpm1 adpm2 adpm3 adpm4 adpm5
                                                                adpm6
        33 3 1.000e-10 1.000e-10 1.000e-10
33 7 1.000e-10 1.000e-10 1.000e-10
                                                                            1.000e-10
                                                                                             1.000e-10
                                                                                                              1.000e-10
                                                                                           1.000e-10
                                                                          1.000e-10
                                                                                                              1.000e-10
               10
                       1.000e-10
                                        1.000e-10 1.000e-10
                                                                          1.000e-10
                                                                                           1.000e-10
                                                                                                             1.000e-10
        33
                                         1.000e-10
        33
                                                                           1.000e-10
1.000e-10
                                                                                            1.000e-10
                                                          1.000e-10
                11
                        1.000e-10
                                                                                                              1.000e-10
        33
                 12
                         1.000e-10
                                          1.000e-10
                                                           1.000e-10
                                                                                             1.000e-10
                                                                                                              1.000e-10
                                        1.000e-10
        33
               14
                       1.000e-10
                                                                          1.000e-10
                                                          1.000e-10
                                                                                           1.000e-10
                                                                                                              1.000e-10
                                                                                           1.000e-10
               3
                       1.000e-10 1.000e-10 1.000e-10
                                                                          1.000e-10
        40
                                        1.000e-10
1.000e-10
                                                                                                              1.000e-10
        40
                7
                         1.000e-10
                                                           1.000e-10
                                                                            1.000e-10
                                                                                             1.000e-10
                                                                                                              1.000e-10
                        1.000e-10
                                          1.000e-10
                                                                            1.000e-10
                                                                                             1.000e-10
                                                          1.000e-10
               10
        40
                                                                                                              1.000e-10
                       1.000e-10
                                        1.000e-10
                                                                          1.000e-10
                                                                                           1.000e-10
        40
               11
                                                         1.000e-10
                                                                                                             1.000e-10
                12 1.000e-10 1.000e-10 1.000e-10
14 1.000e-10 1.000e-10 1.000e-10
                                                                       40
40
                                                                                                              1.000e-10
                                                                                                              1.000e-10
c287 adsorption/desorption rate parameters
C
    only required if gsdfg > 0 (see card 281)
С
     rgid
              reach group id
C
```

40

12

```
dwaid
              general quality id
C
              transfer rates between adsorbed and desorbed states of qual with suspended sand (/day)
     adpm1
              transfer rates between adsorbed and desorbed states of qual with suspended silt (/day)
С
              transfer rates between adsorbed and desorbed states of qual with suspended clay (/day)
С
    adpm3
              transfer rates between adsorbed and desorbed states of qual with bed sand (/day)
     adpm4
С
              transfer rates between adsorbed and desorbed states of qual with bed silt (/day)
С
     adpm5
              transfer rates between adsorbed and desorbed states of qual with bed clay (/day)
С
     adpm6
C
    rgid dwqid
                 adpm1 adpm2
                                 adpm3
                                        adpm4
                                                adpm5
                                                        adpm6
              3
                     0.000010
                                    0.000010
                                                   0.000010
                                                                  0.000010
                                                                                0.000010
                                                                                               0.000010
       33
              7
                     0.000010
                                    0.000010
                                                   0.000010
                                                                  0.000010
                                                                                0.000010
       33
                                                                                               0.000010
                      0.000010
                                    0.000010
                                                   0.000010
                                                                  0.000010
                                                                                0.000010
                                                                                               0.000010
       33
                                    0.000010
                                                                 0.000010
       33
              11
                     0.000010
                                                   0.000010
                                                                                0.000010
                                                                                               0.000010
       33
                     0.000010
                                    0.000010
                                                   0.000010
                                                                 0.000010
                                                                                0.000010
                                                                                               0.000010
              12
                     0.000010
                                    0.000010
                                                  0.000010
                                                                 0.000010
                                                                                0.000010
       33
              14
                                                                                               0.000010
                                                                 0.000010
       40
              3
                     0.000010
                                    0.000010
                                                   0.000010
                                                                                0.000010
                                                                                               0.000010
       40
              7
                     0.000010
                                    0.000010
                                                   0.000010
                                                                 0.000010
                                                                                0.000010
                                                                                               0.000010
       40
              10
                                    0.000010
                                                                                0.000010
                     0.000010
                                                  0.000010
                                                                 0.000010
                                                                                               0.000010
       40
              11
                     0.000010
                                    0.000010
                                                   0.000010
                                                                 0.000010
                                                                                0.000010
                                                                                               0.000010
       40
              12
                     0.000010
                                    0.000010
                                                   0.000010
                                                                 0.000010
                                                                                0.000010
                                                                                               0.000010
                     0.000010
                                                                                               0.000010
       40
              14
                                    0.000010
                                                   0.000010
                                                                 0.000010
                                                                                0.000010
c288 adsorption/desorption temperature correction parameters
    only required if qsdfg > 0 (see card 281)
C
С
              reach group id
С
С
     dwaid
              general quality id
     adpm1
              temperature correction coefficients for adsorption/desorption on suspended sand (range from 1.0
С
to 2.0)
    adpm2
              temperature correction coefficients for adsorption/desorption on suspended silt (range from 1.0
С
to 2.0)
С
    adpm3
              temperature correction coefficients for adsorption/desorption on suspended clay (range from 1.0
to 2.0)
              temperature correction coefficients for adsorption/desorption on bed sand (range from 1.0 to 2.0)
С
     adpm4
              temperature correction coefficients for adsorption/desorption on bed silt (range from 1.0 to 2.0)
С
     adpm5
              temperature correction coefficients for adsorption/desorption on bed clay (range from 1.0 to 2.0)
     adpm6
C
С
   rgid dwgid
                                 adpm3 adpm4
                                                adpm5
C
                 adpm1 adpm2
                                                       adpm6
                                    1.000000
                                                   1.000000
                                                                 1.000000
                                                                                1.000000
       33
              3
                     1.000000
                                                                                               1.000000
       33
              7
                     1.000000
                                    1.000000
                                                   1.000000
                                                                 1.000000
                                                                                1.000000
                                                                                               1.000000
                     1.000000
                                    1.000000
                                                   1.000000
                                                                 1.000000
                                                                                1.000000
       33
              10
                                                                                               1.000000
       33
              11
                     1.000000
                                    1.000000
                                                   1.000000
                                                                 1.000000
                                                                                1.000000
                                                                                               1.000000
                                                                 1.000000
                     1.000000
                                    1.000000
                                                                                               1.000000
       33
              12
                                                   1.000000
                                                                                1.000000
       33
                     1.000000
                                    1.000000
                                                  1.000000
                                                                 1.000000
                                                                                1.000000
                                                                                               1.000000
       40
                     1.000000
                                                   1.000000
                                                                 1.000000
                                                                                1.000000
              3
                                    1.000000
                                                                                               1,000000
       40
              7
                     1.000000
                                    1.000000
                                                   1.000000
                                                                 1.000000
                                                                                1.000000
                                                                                               1.000000
       40
              10
                    1.000000
                                    1.000000
                                                   1.000000
                                                                 1.000000
                                                                                1.000000
                                                                                               1.000000
                                    1.000000
                     1.000000
                                                                 1.000000
       40
              11
                                                   1.000000
                                                                                1.000000
                                                                                               1.000000
       40
              12
                     1.000000
                                    1.000000
                                                   1.000000
                                                                  1.000000
                                                                                1.000000
                                                                                               1.000000
       40
              14
                     1.000000
                                    1.000000
                                                   1.000000
                                                                 1.000000
                                                                                1.000000
                                                                                               1.000000
C-----
c289 initial concentrations on sediment
     only required if qsdfg > 0 (see card 281)
C
     rgid
              reach group id
С
     dwqid
              general quality id
С
     sgal1
              initial concentrations of qual on suspended sand (concu/mg)
              initial concentrations of qual on suspended silt (concu/mg)
    sqal3
              initial concentrations of qual on suspended clay (concu/mg)
C
    sqal4
              initial concentrations of qual on bed sand (concu/mg)
    sgal5
              initial concentrations of qual on bed silt (concu/mg)
C
              initial concentrations of qual on bed clay (concu/mg)
С
    sqal6
С
   rgid dwqid
                        sqal2
                                                sqal5
                                 sqal3 sqal4
C
                 sqall
                                                       sgal6
              3
                     0.000000
                                 0.000000
                                                   0.000000
                                                                  0.000000
                                                                                0.000000
                                                                                               0.000000
       33
       33
              7
                     0.000000
                                    0.000000
                                                   0.000000
                                                                  0.000000
                                                                                0.000000
                                                                                               0.000000
       33
              10
                      0.000000
                                    0.000000
                                                   0.000000
                                                                  0.000000
                                                                                0.000000
                                                                                               0.000000
       33
              11
                     0.000000
                                    0.000000
                                                   0.000000
                                                                  0.000000
                                                                                0.000000
                                                                                               0.000000
       33
              12
                     0.000000
                                    0.000000
                                                   0.000000
                                                                  0.000000
                                                                                0.000000
                                                                                               0.000000
       33
              14
                     0.000000
                                    0.000000
                                                   0.000000
                                                                  0.000000
                                                                                0.000000
                                                                                               0.000000
                     0.000000
                                    0.000000
                                                   0.000000
                                                                  0.000000
                                                                                0.000000
                                                                                               0.000000
       40
              3
                                    0.000000
                                                                 0.000000
              7
                     0.000000
       40
                                                   0.000000
                                                                                0.000000
                                                                                               0.000000
                                                                 0.000000
       40
              10
                     0.000000
                                    0.000000
                                                   0.000000
                                                                                0.000000
                                                                                               0.000000
       40
              11
                     0.000000
                                    0.000000
                                                   0.000000
                                                                 0.000000
                                                                                0.000000
                                                                                               0.000000
                     0.000000
                                                   0.000000
                                                                                0.000000
                                                                                               0.000000
       40
              12
                                    0.000000
                                                                  0.000000
       40
              14
                     0.000000
                                    0.000000
                                                   0.000000
                                                                  0.000000
                                                                                0.000000
                                                                                               0.000000
```

```
admod advection method (1 for dynamic mixing same as in HSPF and 2 for static mixing)
C
    kc crop factor associated with PEVT (used to back-calculate EVAP; EVAP = PEVT/kc)
С
    sedber stream bank erosion sediment (1 for on and 0 for off) (if sedfg=1)
С
  vconfg a value of 1 for vconfg means that F(vol) (volume-dependent) outflow demand components are
C
multiplied by a factor which is allowed to vary through the year.
C
            These monthly adjustment factors are input in Table-type MON-CONVF in this section (card 401)
С
c admod kc sedber
                       vconfa
  1 8.50000000000e-01 0
C--
c401 monthly F(vol) adjustment factors
    only required if vconfg = 1 (see card 400)
C
             stream parameter group id
С
   jan-dec F(vol) adjustment factors at the start of each month
C
c rgid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c405 channel routing network
С
           reach id (same as subbasin id)
С
    control output control switch for the corresponding reach
C
            0 = will not write general output
            1 = will write general output
C
    NumOutlets number of downstream outlets
С
    DSn downstream outlets DS1 Ds2 .... DSn
C
C
    rchid control NumOutlets DS1 DS2 ......
      6665 1 1 0
       6671 1
                    1
                             Ω
             1
1
                    1
       6673
                            0
       6674
                     1
                            0
       6675 1
                    1
       6684 1
                    1
       6839
       6844 1
                    1
       6850 1
                    1
              1
1
       6856
                    1
       6859
                     1
            1
       6861
c407 reach weather multiplier
C
              reach id (same as subbasin id)
    premult multiplier for precipitation
petmult multiplier for potential evapotranspiration
c rchid premult petmult
      6665 1.000000
6671 1.000000
                            1.000000
                         1.000000
1.000000
1.000000
1.000000
1.000000
1.000000
1.000000
       6673 1.000000
       6674 1.000000
6675 1.000000
       6684 1.000000
       6839 1.000000
       6844
              1.000000
                          1.000000
            1.000000
       6850
       6856 1.000000

      6859
      1.000000
      1.000000

      6861
      1.000000
      1.000000

C-----
c410 reach geometry information
C
    rchid reach/lake id (same as subbasin id)
C
  rgid reach/lake group id
    trgid threshold reach/lake group id
C
            reach/lake flag (0 for reach otherwise lake)
            lake flag = 1 (rectangular weir for internal option)
C
            lake flag = 2 (triangular weir for internal option)
            lake flag = 11 (BMP with rectangular weir for internal option)
С
            lake flag = 12 (BMP with triangular weir for internal option)
С
    idepth reach/lake initial water depth (feet)
С
    length reach/lake length (miles)
C
            reach/lake bank full depth (feet)
    width reach/lake bankfull width (feet)
    slope reach longitudinal slope
C
    mann reach Manning's roughness coefficient/lake weir width (ft)
    r1
r2
            reach ratio of bottom width to bank full width (bottom width = r1 * width)/lake orifice height (ft)
С
            reach side slope of flood plane/lake orifice diameter (ft)
```

```
w1
           reach flood plane width factor (total width of flood plane = w1*Width)/lake median particle size
C
diameter, db50 (ft)
C
   crat ratio of maximum velocity to mean velocity in the RCHRES cross-section under typical flow
conditions (greater than or equal to 1)
  ks weighting factor for hydraulic routing (calibration)
C
С
    qloss constant flow loss rate (e.g., infiltration, pumping [in / hr])
С
    qloss_t flow loss target reach ID
   qloss_f flow loss water quality flag for target reach ID (0 - use the target reach instream concentration;
1 - use the source reach instream concentration)
C
c rchid rgid trgid lkfg idepth length depth width slope
                                                            mann r1 r2 w1 crrat ks
qloss qloss_t qloss_f
      6665 33 0
                                                                        60.826032
                         Ω
                                 3.710585
                                              3.279134
                                                           3.710585
                                                                                      0.003924
      0.020000
                   0.500000
                                0.500000
                                              1.500000
                                                           1.500000
                                                                         0.000000
                                                                                      0.000000
      0 0
                  0 0
      6671 33
                                                                        0.000000
                                 0.000000
                                              0.000000
                                                           0.000000
                                                                                      0.001000
                  0.500000
      0.020000
                                0.500000
                                              1.500000
                                                           1.500000
                                                                        0.000000
                                                                                      0.000000
      0 0
      6673 33
                                 1.351690
                                              2.270340
                                                           1.351690
                                                                         14.684861
                                                                                      0.005145
      0.020000
                  0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                        0.000000
                                                                                      0.000000
           0
                   0 0
      6674 33
                                 0.000000
                                              0.000000
                                                           0.000000
                                                                         0.000000
                                                                                      0.001000
                   0.500000
      0.020000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                         0.000000
                                                                                      0.000000
            0
      6675 33
                   0 0
                                 1.289354
                                              4.503094
                                                           1.289354
                                                                         13.694059
                                                                                      0.009414
      0.020000
                   0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                         0.000000
                                                                                      0.000000
      0 0
                    0 0
      6684
            40
                                 0.744742
                                              2.987388
                                                           0.744742
                                                                         6.338506
                                                                                      0.008740
      0.020000
                   0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                         0.000000
                                                                                      0.000000
      0 0
6839 33
                   0 0
                                 0.000000
                                              0.000000
                                                           0.000000
                                                                        0.000000
                                                                                      0.001000
      0.020000
                   0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                        0.000000
                                                                                      0.000000
      0 0
                   0 0
      6844
            40
                                 0.000000
                                              0.000000
                                                           0.000000
                                                                         0.000000
                                                                                      0.001000
      0.020000
                   0.500000
                                                                         0.000000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                                      0.000000
      0 0
                   0 0
      6850 33
                                 0.000000
                                              0.000000
                                                           0.000000
                                                                        0.000000
                                                                                      0.001000
      0.020000
                   0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                        0.000000
                                                                                      0.000000
      0 0
      6856 40
                                 0.748022
                                              2.776538
                                                           0.748022
                                                                         6.377875
                                                                                      0.006990
                   0.500000
      0.020000
                                 0.500000
                                                           1.500000
                                                                                      0.000000
                                              1.500000
                                                                        0.000000
           0
                   0
      6859 33
                         0
                                              0.000000
                                                           0.000000
                                 0.000000
                                                                         0.000000
                                                                                      0.001000
      0.020000
                  0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                         0.000000
                                                                                      0.000000
            0
      Ω
                   0 0
      6861
            40
                                 0.000000
                                              0.000000
                                                           0.000000
                                                                         0.000000
                                                                                      0.001000
      0.020000
                  0.500000
                                0.500000
                                              1.500000
                                                           1.500000
                                                                        0.000000
                                                                                      0.000000
      0 0
c413 Reach Cross-section Information
    rchid    x1 y1 x2 y2...
rchid    reach id (same as subbasin id)
C
С
           distance from the left reach bank (ft)
C
           it should not be greater than bank full width in card 410 (ft)
С
           depth from the bank full reach segment (ft)
C
           it should not be greater than bank full depth in card 410 (ft)
С
c-----
c415 reach discharge-volume relationship
C
   rchid reach id
С
С
   depth water depth (feet)
   area water surrace u_vol water volume (ac-ft)
           water surface area (acres)
С
   disch(1, 2, 3, ....noutflows) outflows (cfs)
C
c rchid depth area vol disch1 disch2 ...... dischN
C------
c420 general point source information
С
    nPtSource number of individual point sources
С
  nPtQuals number of point source quals
C
 nPtSource nPtOuals
C
   0 0
c425 point source
  Qualindex point source qual index
```

```
Qualname point source qual name
C
    Qualid point source qual id
С
           point source sediment associated qual fraction (0-1)
С
С
c Qualindex Qualname qualid
C---
c430 point source withdrawal
    subbasin point source reach id
C
    permit point source permit pipe point source pipe
С
С
    wd_target point source withdrawal target reach id
C
c subbasin permit pipe wd_target
c435 linkage controls (optional)
                 reach id (same as subbasin id)
C
    rchid
                 outlet control switch for the corresponding reach
С
    outlet
                 0 = will read input timeseries file
С
С
                    (rchid/outlet can be duplicated for multiple input files)
                 n = will write output timeseries file for outlet n.
С
С
    filepath
                the timeseries file path (continuous string without space)
        outlet filepath
c rchid
C-----
c440 sediment parameters controls
C
           if crvfg = 1, erosion-related cover may vary throughout the year.
С
           values are supplied in Table-type MON-COVER (card 453)
C
    vsivfg if vsivfg = 1, the rate of net vertical sediment input may vary throughout the year.
С
            if vsivfg = 2, the vertical sediment input is added to the detached sediment storage only on days
C
when no rainfall occurred during the previous day.
           values are supplied in Table-type MON-NVSI (card 454)
C
С
    sandfg if sandfg = 0, the sand is not simulated.
            if sandfg = 1, the sand transport capacity is calculated using the Toffaleti method.
C
           if sandfg = 2, the sand transport capacity is calculated using the Colby method.
C
           if sandfg = 3, the sand transport capacity is calculated using the power function of velocity.
    sweepfg if sweepfg = 0, the street sweeping is not simulated.
C
С
           if sweepfg = 1, the street sweeping is applied to sediemnt only.
           if sweepfg = 2, the street sweeping is applied to sediment and general water quality constituents.
C
С
      g vsivfg sandfg 0 0 3
                           sweepfg
                           0
C------
c445 street sweeping for sediment (read if sedfg = 1)
C
   deluid landuse id (impervious only)
deluname landuse name
C
c deluid
С
  start_month start month of street sweeping requirement
C
  end_month end month of street sweeping requirement
C
                days between street sweeping within the landuse (0 for no sweeping)
   frequency
C
   percent_area fraction of land surface which is available for street sweeping (0 for no sweeping)
С
   effic_sand fraction of sand in solids storage that is available for removal by sweeping (0-1)
С
  effic_silt
                fraction of silt in solids storage that is available for removal by sweeping (0-1)
C
   effic_clay fraction of clay in solids storage that is available for removal by sweeping (0-1)
С
С
c defid deluid deluname start_month end_month frequency percent_area effic_sand effic_silt
effic_clay
C-----
c446 street sweeping for GQual (read if sedfg = 1 and pqalfg = 1)
С
                parameter group id
C
    defid
   deluid
                 landuse id (impervious only)
C
  deluname
                landuse name
   effic_GQual fraction of general water quality constituent in surface storage that is available for
C
removal by sweeping (0-1)
c defid deluid deluname effic_GQual1 effic_GQual2 ... effic_GQualn
C--
c450 sediment parameter group 1 (read if sedfg =1)
    defid parameter group id
deluid landuse id
C
C
   smpf supporting management practice factor
C
   krer
           coefficient in the soil detachment equation
С
    jrer
           exponent in the soil detachment equation
    affix fraction by which detached sediment storage decreases each day as a result of
C
            soil compaction. (/day)
```

```
fraction of land surface which is shielded from rainfall erosion
С
             rate at which sediment enters detached storage from the atmosphere (lb/ac/day)
C
    nvsi
С
             negative value may be used to simulate removal by human activity or wind
    kser
             coefficient in the detached sediment washoff equation
С
     jser
             exponent in the detached sediment washoff equation
С
     kger
             coefficient in the matrix soil scour equation, which simulates gully erosion
С
С
     jger
             exponent in the matrix soil scour equation, which simulates gully erosion
     accsdp rate at which solids accumulate on the land surface (used in impervious land)
С
     remsdp fraction of solids storage which is removed each day when there is no runoff,
             for example because of street sweeping (used in impervious land)
```

	ple, because o	of street sweepi	ng (used in ir	mpervious land	.)	
c c defid deluid smpf	krer jrer	affix cover	nvsi kser	jser kger	jger accsdp i	remsdp
33 1000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.004000	0.050000	0.00000
33 2000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.003000	0.050000	0.00000
33 3000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.20000	1.800000	0.000000	1.000000	0.002000	0.050000	0.00000
33 4000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.003000	0.050000	0.000000
33 5000	1.000000	0.000000	0.000000	0.003000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.000000	0.050000	0.00000
33 6000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000				0.050000	0.00000
		0.00000 0.00000	1.000000	0.003000	0.000000	0.000000
33 7000 0.200000	1.000000			0.000000		0.00000
	1.800000	0.000000	1.000000	0.004000	0.050000	0.000000
33 8000	1.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.200000	1.800000	0.000000	1.000000	0.002500	0.050000	0 000000
33 9000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.000200	0.050000	0 000000
33 10000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	1.800000	0.000000	1.000000	0.000000	0.000000	0 000000
33 11111	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0 000000
33 11112	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 11121	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.00000	0.00000	0.00000	
33 11122	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 11211	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 11212	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.00000	0.00000	
33 11221	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.00000	
33 11222	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 11311	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 11312	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 11321	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.00000	
33 11322	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.00000	0.000000	
33 11411	1.000000	0.150000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 11412		0.150000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 11421	1.000000	0.150000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 11422	1.000000	0.150000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 12111	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 12112	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 12121	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 12122	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.00000	
33 12211	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.00000	
33 12212	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 12221	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.00000	

33 12222	1.000000	0.40000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 12311	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 12312	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
33 12321	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
						0.00000
0.350000	2.000000	0.00000	1.000000	0.00000	0.00000	
33 12322	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 12411	1.000000	0.110000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 12412	1.000000	0.110000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.000000	0.000000	
33 12421	1.000000	0.110000	2.000000	0.100000	0.920000	0.000000
0.350000						0.00000
	2.000000	0.000000	1.000000	0.000000	0.000000	0 000000
33 12422	1.000000	0.110000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.00000	
33 13111	1.000000	0.150000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13112	1.000000	0.150000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 13121	1.000000	0.150000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	0.000000
						0 000000
33 13122	1.000000	0.150000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 13211	1.000000	0.200000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13212	1.000000	0.200000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13221	1.000000	0.200000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	0.00000
						0.000000
33 13222	1.000000	0.200000	2.000000	0.100000	0.500000	0.00000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 13231	1.000000	0.200000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13232	1.000000	0.200000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13311	1.000000	0.180000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 13312	1.000000	0.180000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000		2.500000		0.000000	0.00000
		1.500000		0.000000		0 000000
33 13321	1.000000	0.180000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 13322	1.000000	0.180000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13331	1.000000	0.180000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13411	1.000000	0.220000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 13412	1.000000	0.220000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	0.000000
						0 000000
33 13421	1.000000	0.220000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.00000	
33 13422	1.000000	0.220000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 13431	1.000000	0.220000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13432	1.000000	0.220000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 14121	1.000000	0.225000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.00000	0.000000
						0 000000
33 14122	1.000000	0.225000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 14131	1.000000	0.225000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 14132	1.000000	0.225000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 14221	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 14222	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
						0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	0 000000
33 14231	1.000000	0.330000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 14232	1.000000	0.330000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 14321	1.000000	0.405000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
						

22 14200	1 000000	0 405000	0.00000	0 100000	0 500000	0 000000
33 14322	1.000000	0.405000	2.000000	0.100000	0.70000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 14331	1.000000	0.405000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.00000	0.000000	
33 14332	1.000000	0.405000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	0.00000
						0 000000
33 14421	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 14422	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.00000	0.00000	
33 14431	1.000000	0.330000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.00000	0.000000	
33 14432	1.000000	0.330000	2.000000	0.100000	0.600000	0.000000
						0.00000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 15121	1.000000	0.075000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.00000	0.00000	
33 15122	1.000000	0.075000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.00000	
33 15131	1.000000	0.075000	2.000000	0.100000	0.900000	0.000000
0.500000						0.000000
	2.000000	0.375000	2.500000	0.000000	0.000000	
33 15132	1.000000	0.075000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	
33 15221	1.000000	0.110000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.00000	
33 15222	1.000000	0.110000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.000000	0.00000
				0.100000		0.000000
33 15231	1.000000	0.110000	2.000000		0.800000	0.00000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	
33 15232	1.000000	0.110000	2.000000	0.100000	0.80000	0.000000
0.500000	2.000000	0.375000	2.500000	0.00000	0.00000	
33 15321	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.00000	0.000000	
33 15322	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
						0.00000
0.350000	2.000000	0.375000	2.500000	0.000000	0.000000	
33 15331	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.500000	2.000000	0.375000	2.500000	0.00000	0.000000	
33 15332	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	
33 15421	1.000000	0.011000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.075000	2.500000	0.000000	0.000000	0.00000
						0.000000
33 15422	1.000000	0.011000	2.000000	0.100000	0.700000	0.00000
0.350000	2.000000	0.075000	2.500000	0.000000	0.000000	
33 15431	1.000000	0.011000	2.000000	0.100000	0.900000	0.00000
0.500000	2.000000	0.075000	2.500000	0.00000	0.00000	
33 15432	1.000000	0.011000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.075000	2.500000	0.000000	0.000000	
33 16000	1.000000	0.00000	2.000000	0.100000	0.000000	0.000000
0.000000	2.000000	0.000000	1.000000	0.000000	0.000000	0.000000
40 1000	1.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.200000	1.800000	0.00000	1.000000	0.004000	0.050000	
40 2000	1.000000	0.00000	0.000000	0.000000	0.00000	0.000000
0.200000	1.800000	0.00000	1.000000	0.003000	0.050000	
40 3000	1.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.00000	1.000000	0.002000	0.050000	
40 4000	1.000000	0.000000	0.000000	0.002000	0.000000	0.000000
0.200000						0.00000
	1.800000	0.000000	1.000000	0.003000	0.050000	0 000000
	1.000000		0.000000	0.00000	0.000000	0.000000
0.200000	1.800000	0.00000	1.000000	0.001500	0.050000	
40 6000	1.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.003000	0.050000	
40 7000	1.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.004000	0.050000	0.00000
40 8000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.200000	1.800000	0.000000	1.000000	0.002500	0.050000	
40 9000	1.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.00000	1.000000	0.000200	0.050000	
40 10000	1.000000	0.00000	0.00000	0.000000	0.000000	0.000000
0.000000	1.800000	0.00000	1.000000	0.000000	0.000000	
40 11111	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	3.30000
						0 000000
40 11112	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.000000	0.000000	
40 11121	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.000000	0.000000	
40 11122	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.000000	0.000000	
40 11211	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
						0.00000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	

40 11212	1.000000	0.40000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11221	1.000000	0.40000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11222	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
						0.00000
0.200000	2.000000	0.00000	1.000000	0.00000	0.00000	
40 11312	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11321	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.00000	
40 11322	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
40 11411	1.000000	0.150000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0.000000
						0 000000
40 11412	1.000000	0.150000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	
40 11421	1.000000	0.150000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11422	1.000000	0.150000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.000000	0.000000	
40 12111	1.000000	0.200000	2.000000	0.100000	0.900000	0.00000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
	1.000000		2.000000	0.100000		0.000000
		0.200000			0.900000	0.00000
0.200000	2.000000	0.000000	1.000000	0.000000	0.00000	
40 12121	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12122	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12211	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
40 12212	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
						0.00000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	
40 12221	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12222	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12311	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.00000	
40 12312	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000				0.000000	0.00000
		0.000000	1.000000	0.000000		0 00000
40 12321	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
40 12322	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12411	1.000000	0.110000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12412	1.000000	0.110000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
40 12421	1.000000	0.110000	2.000000	0.100000	0.920000	0.000000
0.350000						0.00000
	2.000000	0.000000	1.000000	0.000000	0.000000	
40 12422	1.000000	0.110000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
40 13111	1.000000	0.150000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13112	1.000000	0.150000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.00000	
40 13121	1.000000	0.150000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13122	1.000000	0.150000	2.000000	0.100000	0.500000	0.000000
0.350000		1.500000	2.500000			0.00000
	2.000000			0.000000	0.000000	0 000000
40 13211	1.000000	0.200000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13212	1.000000	0.200000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13221	1.000000	0.200000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13222	1.000000	0.200000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13231	1.000000	0.200000	2.000000	0.100000	0.300000	0.000000
						0.000000
0.500000	2.000000	1.500000	2.500000	0.000000	0.000000	0 000000
40 13232	1.000000	0.200000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13311	1.000000	0.180000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13312	1.000000	0.180000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	

40 13321	1.000000	0.180000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13322	1.000000	0.180000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13331	1.000000	0.180000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13411	1.000000	0.220000	2.000000	0.100000	0.800000	0.000000
						0.00000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13412	1.000000	0.220000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13421	1.000000	0.220000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.00000	
40 13422	1.000000	0.220000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.00000	
40 13431	1.000000	0.220000	2.000000	0.100000	0.300000	0.000000
0.500000						0.000000
	2.000000	1.500000	2.500000	0.000000	0.000000	0 000000
40 13432	1.000000	0.220000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 14121	1.000000	0.225000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.00000	0.00000	
40 14122	1.000000	0.225000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14131	1.000000	0.225000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	0.00000
						0 000000
40 14132	1.000000	0.225000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.750000	2.500000	0.00000	0.00000	
40 14221	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.00000	0.000000	
40 14222	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14231	1.000000	0.330000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	0.00000
						0.000000
	1.000000	0.330000	2.000000	0.100000	0.800000	0.00000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14321	1.000000	0.405000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.00000	0.000000	
40 14322	1.000000	0.405000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.00000	0.000000	
40 14331	1.000000	0.405000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.00000	
40 14332	1.000000	0.405000	2.000000	0.100000	0.600000	0.000000
						0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	0 00000
40 14421	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14422	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.00000	0.00000	
40 14431	1.000000	0.330000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.00000	0.000000	
40 14432	1.000000	0.330000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	0.00000
40 15121	1.000000	0.075000	2.000000	0.100000	0.700000	0.000000
0.350000						0.000000
	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15122	1.000000	0.075000	2.00000	0.100000	0.70000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.00000	
40 15131	1.000000	0.075000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.375000	2.500000	0.00000	0.000000	
40 15132	1.000000	0.075000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.375000	2.500000	0.00000	0.00000	
40 15221	1.000000	0.110000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15222	1.000000	0.110000	2.000000	0.100000	0.700000	0.000000
0.350000			2.500000			0.00000
	2.000000	0.375000		0.000000	0.000000	0 000000
40 15231	1.000000	0.110000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15232	1.000000	0.110000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15321	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15322	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.000000	2.00000
40 15331	1.000000	0.375000	2.000000	0.100000	0.700000	0.000000
						0.00000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	0 000000
40 15332	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.500000	2.000000	0.375000	2.500000	0.00000	0.00000	
40 15421	1.000000	0.011000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.075000	2.500000	0.000000	0.000000	
40 15422	1.000000	0.011000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.075000	2.500000	0.000000	0.000000	

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               15431 1.000000
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c451 sediment parameter group 2 (read if sedfg =1)
     defid
               parameter group id
     deluid
               landuse id
     sed-suro background concentration associated with surface flow (mg/l)
     sed-ifwo background concentration associated with interflow outflow (mg/l)
               background concentration associated with groundwater outflow (mg/l)
     sed_i
               fraction of sediment class_i (sand, silt, and clay)
     (sand + silt + clay = 1)
     Background sediment load is added to total sediment from LAND prior to applying fractions
c defid
         deluid
                    sed suro
                              sed_ifwo sed_agwo
                                                     sed 1
                                                            sed_2
                                                                     sed_3 ....sed_n
               1000
                      0.000000
                                     0.000000
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33	13422	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	13431	0.000000					
			1.000000	1.000000	0.600000	0.200000	0.200000
33	13432	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	14121	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	14122	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	14131	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33							
	14132	0.000000	1.000000	1.000000	0.70000	0.100000	0.200000
33	14221	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	14222	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	14231	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	14232	0.00000	1.000000	1.000000	0.200000	0.650000	0.150000
33	14321	0.000000	1.000000		0.500000	0.200000	0.300000
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33	14322	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	14331	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	14332	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	14421	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	14422	0.00000	1.000000	1.000000	0.600000	0.200000	0.200000
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	14431	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	14432	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	15121	0.000000	1.000000	1.000000	0.70000	0.100000	0.200000
33	15122	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	15131	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	15132	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
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	15221	0.000000	1.000000	1.000000		0.650000	0.150000
33	15222	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	15231	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	15232	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	15321	0.00000	1.000000	1.000000	0.500000	0.200000	0.300000
33	15322	0.000000	1.000000	1.000000			0.300000
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33	15331	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	15332	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	15421	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	15422	0.00000	1.000000	1.000000	0.600000	0.200000	0.200000
33	15431	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	15432	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	16000	0.000000	0.000000	0.000000	0.00000	0.00000	0.00000
40	1000	0.000000	0.000000	0.00000	0.100000	0.70000	0.200000
40	2000	0.000000	0.000000	0.000000	0.100000	0.700000	0.200000
40	3000	0.00000	0.000000	0.000000	0.100000	0.700000	0.200000
40	4000	0.000000	0.000000	0.000000	0.100000	0.700000	0.200000
40	5000	0.00000	0.00000	0.00000	0.100000	0.70000	0.200000
40	6000	0.000000	0.000000	0.000000	0.100000	0.700000	0.200000
40	7000	0.000000	0.00000	0.00000	0.100000	0.70000	0.200000
40	8000	0.000000	0.000000	0.000000	0.100000	0.700000	0.200000
40	9000	0.000000	0.000000	0.000000	0.100000	0.700000	0.200000
40	10000	150.000000	0.000000	0.000000	0.100000	0.700000	0.200000
40	11111	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	11112	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	11121	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	11122	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	11211	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	11212	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	11221	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	11222	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	11311	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
40	11312	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
40	11321	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
40	11322	0.00000	1.000000	1.000000	0.500000	0.200000	0.300000
40	11411	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
40	11412	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
40	11421	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
40	11422	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
40	12111	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	12112	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	12121	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	12122	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	12211	0.00000	1.00000	1.000000	0.200000	0.650000	0.150000
40	12212	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	12221	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	12222	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	12311	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
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40	12312	0.000000		1.000000	0.500000	0.200000	0.300000
40	12321	0.00000	1.00000	1.000000	0.500000	0.200000	0.300000
40	12322	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
40	12411	0.00000	1.000000	1.000000	0.600000	0.200000	0.200000
40	12412	0.00000	1.000000	1.000000	0.600000	0.200000	0.200000
40	12421	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
40	12421	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
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c452 GQUAL-sediment to stream mapping (read if sediment as gqual)
                         landuse type flow id (1 = impervious surfaceflow,
                         2 = pervious surfaceflow, 3 = pervious interflow, 4 = pervious groundflow)
```

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defid parameter group id
   dwqid general quality id
C
C
   sed_i fraction of sediment class_i (sand, silt, and clay)
C
C-----
                                          _____
c453 monthly erosion-related cover values
  only required if crvfg = 1 (see card 440)
C
  defid parameter group id
   deluid landuse id
C
   jan-dec erosion-related cover values at start of each month
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c454 monthly net vertical sediment input
  only required if vsivfg = 1 (see card 440)
C
  defid parameter group id
C
   deluid landuse id
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```
jan-dec net vertical sediment input at start of each month (lb/acre/day)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c455 sediment general parameters group 3 (read if sedfg = 1)
     general sediment related parameters for instream transport
C
С
                 stream parameter group id
C
c bedwid bed width (ft) - this is constant for the entire simulation period
     beddep initial bed depth (ft)
C
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      por
                 porosity
c burial burial rate of aggregated sediment layer (in/day)
               if burial = 0 then burial rate in card 456 is used
C
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c rgid bedwid beddep por burial

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c456 sediment parameters group 4 (read if sedfg = 1)
     cohesive suspended sediment variables for instream transport
C
c rgid stream parameter group id
c sed_id sediment class id
c sedflg sediment flag indicating sediment class (0 for sand, 1 for silt, and 2 for clay)
c sedo initial sediment conc in fluid phase (mg/liter)
c sedfrac initial sediment fractions (by weight) in the bed material
c db50/d median diameter of the non-cohesive sediment (sand) (in) (sandfg = 1 or 2)
/ effective diameter of the cohesive particles (silt and clay) (in)
                        / effective diameter of the cohesive particles (silt and clay) (in)
C
C W
                       corresponding fall velocity of the particle in still water (in/s)
     ..
rho
                        density of the particles (gm/cm^3)
C
      ksand/taucd coefficient in the sandload power function formula (sandfg = 3)
C
                        / critical bed shear stress for deposition of the cohesive particle - generally taucd <=
С
taucs (lb/ft^2)
С
                         if tau > taucd then no deposition
                        if tau < taucd then deposition rate approaches settling velocity, w
С
   expsnd/taucs
                        exponent in the sandload power function formula (sandfg = 3)
                         / critical bed shear stress for scour of the cohesive particle (lb/ft^2)
C
С
                         if tau < taucs then no scour
                         if tau > taucs then scour steadily increases
C
                         erodibility coefficient of the cohesive particle (lb/ft^2/day)
С
      burial
С
                         burial rate of the sediment particle (in/day)
                         it is used if burial rate in card 455 is zero
C
C
c rgid sed_id sedflg sedo sedfrac db50/d w rho ksand/taucd expsnd/taucs m burial
         33 1 0 0.000000 0.100000 0.010000 0.800000 2.500000 0.100000 0.0000000
         33 2 1 0.000000 0.700000 0.000600
0.104427 0.292396 0.010000 0.000000
                                                                                           0.000500
                                                                                                                2.200000

      0.104427
      0.292396
      0.010000
      0.000000
      0.000000

      33
      3
      2
      0.000000
      0.200000
      0.000100
      0.000050

      40
      1
      0
      0.000000
      0.100000
      0.010000
      0.800000

      40
      2
      1
      0.000000
      0.700000
      0.000600
      0.00050

      40
      2
      1
      0.010000
      0.000000
      0.00050

      0.016708
      0.125311
      0.010000
      0.000000
      0.000100
      0.000050

      40
      3
      2
      0.000000
      0.000000
      0.000100
      0.000050

      0.08354
      0.062655
      0.050000
      0.000000
      0.000000

                                                                                                              2.000000
                                                                                                                2.500000
                                                                                                                2.200000
                                                                                                                2.000000
c457 Streambank erosion sediment parameters (read if sedfg = 1 and sedber = 1)
C
   rchid reach id
С
C
      lber erodible stream length (miles)
   kber
               coefficient for scour of the bank matrix soil (calibration)
C
               exponent for scour of the bank matrix soil (calibration)
     qber bank erosion flow threshold causing channel bank soil erosion (cfs)
C
                if = negative then threshold flow is at the bank full depth (cfs)
С
     potNH4 particulate NH4-N bank erosion potency factor for RQUAL (lb/ton-sediment)
c potPO4 particulate PO4-P bank erosion potency factor for RQUAL (lb/ton-sediment)
     sed_i fraction of sediment class_i (sand, silt, and clay)
С
C
c rchid lber kber jber qber potNH4 potPO4 sed_1 sed_2 sed_3 ....sed_n
C-----
c460 soil temperature control (read if tempfg = 1)
C
      msltfg if = 1 monthly vary aslt and bslt parameters in surface flow temperature calculation
С
     miftfq if = 1 monthly vary aift and bift parameters in interflow temperature calculation
      mgwtfg if = 1 monthly vary agwt and bgwt parameters in ground water temperature calculation
С
```

```
c msltfg
          miftfa
                    mawtfa
                                     ______
c461 Soil Temperature (read if tempfg =1)
C
          parameter group id
C
c deluid landuse id
    tsopfg if = 0 compute subsurface temperatures using a mean departure from air temperature plus a smoothing
factor
           if = 1 compute subsurface temperature using regression
           if = 2 the lower/gw layer temperature is a function of upper layer temperature instead of air
C
temperature
c aslt
           surface layer temperature when the air temperature 0 degrees C
   bslt
C
           slope of the surface layer temperature regression equation
           mean difference between interflow temperature and air temperature (C)
C
   aift
          smoothing factor in the interflow temperature calculation
  bift
C
  agwt
         mean difference between groundwater temperature and air temperature (C)
C
   bgwt
          smoothing factor in the groundwater temperature calculation
С
   islt
          initial surface flow temperature (C)
   iift
          initial interflow temperature (C)
C
C
   i.awt.
         initial groundwater temperature (C)
С
           y = a + b * x
C
c defid deluid tsopfg aslt bslt aift bift agwt bgwt islt iift igwt
C-----
c462 mon-aslt
   only required if tempfg = 1 and msltfg = 1 (see card 460)
C
C
C
           parameter group id
  deluid landuse id
C
c jan-dec surface layer temperature when the air temperature 0 degrees C at start of each month (C)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C----
c463 mon-bslt
C
   only required if tempfg = 1 and msltfg = 1 (see card 460)
C
  defid parameter group id
   deluid landuse id
C
C
    jan-dec slope of the surface layer temperature regression equation at start of each month
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c464 mon-aift
   only required if tempfg = 1 and miftfg = 1 (see card 460)
C
C
   defid parameter group id
   deluid landuse id
C
С
   jan-dec mean difference between interflow temperature and air temperature at start of each month (C)
С
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c465 mon-bift
   only required if tempfg = 1 and miftfg = 1 (see card 460)
C
C
c defid parameter group id
c deluid landuse id
С
   jan-dec smoothing factor in the interflow temperature calculation at start of each month
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c466 mon-agwt
С
   only required if tempfg = 1 and mgwtfg = 1 (see card 460)
C
C
   defid parameter group id
 deluid landuse id
C
   jan-dec mean difference between groundwater temperature and air temperature at start of each month (C)
C
С
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c467 mon-bgwt
   only required if tempfg = 1 and mgwtfg = 1 (see card 460)
C
   defid parameter group id deluid landuse id
C
   jan-dec smoothing factor in the groundwater temperature calculation at start of each month
C
                             apr may jun jul aug sep oct nov dec
c defid deluid jan feb mar
c470 Temperature Parameters for Land Groups (read if tempfg =1)
```

```
C
    subbasin
               subbasin id
С
           the mean watershed elevation (ft)
С
              difference in elevation between watershed and the air temperature gage (ft)
С
    eldat
    rmelev
              the mean RCHRES elevation (ft)
C
С
               difference in elevation between the RCHRES and the air temperature gage (ft)
               (positive if RCHRES is higher than the gage).
С
C
c subbasin melev
                    eldat rmelev
                                     reldat
C-
c474 24-hourly dry lapse rates (read if tempfg = 1)
C
    12AM-11PM lapse_rate - dry period lapse rate varying between 0.0035 to 0.005 (degree F/ft)
C
С
   12AM
         1AM
              2AM 3AM
                         4AM
                               5AM 6AM 7AM 8AM 9AM 10AM 11AM 12PM 1PM 2PM 3PM
                                                                                              4PM
                                                                                                    5PM
C
6PM 7PM 8PM 9PM 10PM 11PM
C-----
c475 Temperature Parameters for Stream Groups (read if tempfg =1)
C
С
  rgid
            stream parameters group id
    cfsaex correction factor for solar radiation; fraction of RCHRES surface exposed to radiation
С
   katrad longwave radiation coefficient
C
c kcond conduction-convection heat transport coefficient
   kevap evaporation coefficient
C
С
c rgid cfsaex katrad
                          kcond
                                   kevap
     ______
c480 Bed Heat Conduction Parameters for Stream Groups (read if tempfg=1)
C
    rgid
            stream parameters group id
C
    preflg flag for heat transfer rates for water surface (0 = off)
С
    bedflg bed conduction flag
С
            0 - bed conduction is not simulated
C
С
            1 - single interface (water-mud) heat transfer method
C
            2 - two-interface (water-mud and mud-ground) heat transfer method
            3 - Jobson method (not supported)
C
  tgflg source of the ground temperature for the bed conduction (used when bedflg is 1 or 2)
            1 - time series (not supported)
C
            2 - single value
С
            3 - monthly values (card 485)
C
   muddep depth of the mud layer in the two-interface model (bedflg = 2) (m)
С
C
           constant (tgflg = 2) ground temperature (bedflg = 1 or 2) (degree C)
           heat conduction coefficient between water and the mud/ground (bedflg = 1 or 2) (kcal/m2/degC/hr)
C
    kmud
    kgrnd heat conduction coefficient between ground and mud in the two-interface model (bedflg = 2)
(kcal/m2/degC/hr)
c rgid preflg bedflg tgflg muddep tgrnd kmud kgrnd
                                                            ______
c485 monthly ground temperatures for bed heat conduction algorithms
    only required if tgflg = 3 (see card 480)
C
   raid
            stream parameter group id
C
    jan-dec tgrndm - monthly ground temperatures for use in the bed heat conduction models (degree C)
С
C
c rgid jan feb mar apr may jun jul aug sep oct nov dec
c-
c500 land to stream mapping (read if oxfg =1)
    deluid landuse id
C
С
    dwaid
           general quality id
    lutype landuse type flow id (1 = impervious surfaceflow,
C
С
            2 = pervious surfaceflow, 3 = pervious interflow, 4 = pervious groundflow)
C
    bod
           bod fraction in pqual
C
   nox
           nitrate fraction in pqual
           total ammonia fraction in pqual
C
          particulate NH4-N fraction in pqual
   snh4
C
           ortho-phosphorus fraction in pqual
С
   spo4 particulate PO4-P fraction in pqual
C
           organic-nitrogen fraction in pqual
С
   orn
           organic-phosphorus fraction in pqual
С
    orp
С
    orc
           organic-carbon fraction in pqual
c deluid dwqid lutype bod nox tam snh4 po4 spo4 orn orp orc
c501 atmosphere to stream mapping
C
    only required if adfgrch = 1 (see card 280)
C
С
    raid
          stream parameter group ID
```

```
dwgid general quality ID
C
    bod
           bod fraction in PQUAL
С
С
    nox
           nitrate fraction in PQUAL
           total ammonia fraction in PQUAL
С
    tam
          orthophosphate fraction in PQUAL
C
   po4
С
    orn
          organic-nitrogen fraction in PQUAL
С
    orp
           organic-phosphorus fraction in PQUAL
           organic-carbon fraction in POUAL
C
    orc
c rgid dwqid bod nox tam po4 orn orp orc
C----
c502 gases control (read if oxfg =1)
C
    midofg if = 1 monthly very DO concentration in interflow
C
    mico2fg if = 1 monthly very CO2 concentration in interflow
C
    madofg if = 1 monthly very DO concentration in ground water
C
    maco2fg if = 1 monthly very CO2 concentration in ground water
С
c midofq
          mico2fq
                      madofq
                                 maco2fq
C----
c503 DO-CO2 Control constant values (read if oxfg =1)
C
           parameter group id
    defid
   deluid landuse id
C
   sdoxp
            concentration of dissolved oxygen in surface flow (mg/l)
С
           concentration of dissolved CO2 in surface flow (mg/l)
С
  sco2p
  idoxp concentration of dissolved oxygen in interflow outflow (mg/l)
C
           concentration of dissolved CO2 in interflow outflow (mg/l)
C
  adoxp concentration of dissolved oxygen in active groundwater outflow (mg/l)
C
  aco2p concentration of dissolved CO2 in active groundwater outflow (mg/l)
C
c defid deluid sdoxp sco2p idoxp ico2p adoxp
                                                         aco2p
C----
c504 mon-DO (interflow) mg C/l
С
   only required if oxfg = 1 and midofg = 1 (see card 502)
C
   defid parameter group id
   deluid landuse id
C
С
    jan-dec interflow dissolved oxygen concentration at start of each month (mg/l)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c505 mon-DO (groundwater)
   only required if oxfg = 1 and madofg = 1 (see card 502)
C
C
   defid parameter group id
   deluid landuse id
C
С
    jan-dec groundwater dissolved oxygen concentration at start of each month (mg/l)
С
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c506 mon-CO2 (interflow) mg C/l
   only required if oxfg = 1 and mico2fg = 1 (see card 502)
С
C
  defid parameter group id deluid landuse id
C
C
С
    jan-dec interflow carbon dioxide concentration at start of each month (mg/l)
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c507 mon-CO2 (groundwater)
   only required if oxfg = 1 and maco2fg = 1 (see card 502)
C
C
C
   defid parameter group id
  deluid landuse id
    jan-dec groundwater carbon dioxide concentration at start of each month (mg/l)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c510 DO/BOD control
C
            benthic release flag (for benthic related parameters)
   reamfg reaeration flag (indicates the method used to calculate the reaeration coefficient for free-flowing
C
streams)
c    if = 1 then Tsivoglou method is used
    if = 2 then Owens, Churchill, or O'Connor-Dobbins method is used depending on velocity and depth of water
   if = 3 then Coefficient is calculated as a power function of velocity and/or depth
C
C
c benrfg
          reamfg
```

```
c511 ox-parm1
C
С
    rgid
            stream parameter group id
    kbod20 bod decay rate at 20oC (1/hr)
C
    t.cbod
            temperature adjustment coefficient for bod decay
C
С
    kodset bod settling rate (m/hr)
    supsat maximum allowable dissolved oxygen supersaturation (expressed as a multiple of the dissolved oxygen
C
saturation concentration)
    tcginv temperature correction coefficient for surface gas invasion
C
С
            empirical constant in the equation
    reak
            if reamfg = 1 then it is an escape coefficient (1/ft)
C
            if reamfg = 3 then it is used to calculate the reaeration coefficient (1/hr)
C
    expred exponent to depth in the reaeration coefficient equation (for reamfg = 3)
C
    exprev exponent to velocity in the reaeration coefficient equation (for reamfg = 3)
C
    cforea correction factor in the lake reaeration equation; it accounts for good or poor circulation
С
characteristics
C
c rgid kbod20 tcbod kodset supsat tcginv reak expred exprev cforea
c512 ox-parm2
C
    rgid
               stream parameter group id
               benthal oxygen demand at 20 degrees C (with unlimited DO concentration) (mg/m2/hr)
    benod
C
   temperature correction coefficient for benthal oxygen demand expod exponential factor in the dissolved oxygen term of the benthal oxygen demand equation brbod benthal release rate of ROD under serobic conditions (m. (2.2))
С
C
C
               benthal release rate of BOD under aerobic conditions.(mg/m2/hr)
    brbod_inc increment to benthal release of BOD under anaerobic conditions. (mg/m2/hr)
C
               the exponent in the DO term of the benthal BOD release equation
C
    expre1
c rgid benod tcben expod brbod brbod_inc exprel
c-----
c513 oxrx-initial conditions
C
С
    rgid stream parameter group id
    dox DO initial condition. (mg/l)
C
c bod BOD initial condition in water column. (mg/l)
    satdo Initial DO saturation concentration. (mg/l)
C
c rgid dox bod satdo
c514 ox-scour parms
C
С
          stream parameter group id
    scrvel threshold velocity above which the effect of scouring on benthal release rates is considered. (m/s)
C
    scrmul multiplier by which benthal releases are increased during scouring.
c rgid scrvel scrmul
C-
c520 nutrients control
    tamfq
             total ammonia flag
C
    no2fg
            nitrite flag
С
  po4fg
            ortho-phosphorus flag
C
   amvfg
С
            ammonia volatilization flag
C
    denfg
             denitrification flag
    adnhfg NH4 adsorption flag
С
    adpofg PO4 adsorption flag
С
    mphfq
            monthly pH flag (not supported in this version)
C
c tamfg no2fg po4fg amvfg denfg adnhfg adpofg mphfg
C---
c521 nut-parm1
С
    rgid
C
            stream parameter group id
   cvbo
            conversion from milligrams biomass to milligrams oxygen (mg/mg)
C
    cvbpc
            conversion from biomass expressed as phosphorus to carbon (mols/mol)
С
С
    cvbpn conversion from biomass expressed as phosphorus to nitrogen (mols/mol)
    bpcntc percentage of biomass which is carbon (by weight)
    ktam20 nitrification rate of ammonia at 20 degrees C (1/hr)
C
    kno220 nitrification rate of nitrite at 20 degrees C (1/hr)
С
            temperature correction coefficient for nitrification
    kno320 nitrate denitrification rate at 20 degrees C (1/hr)
C
    tcden temperature correction coefficient for denitrification denoxt dissolved oxygen concentration threshold for denitrification (mg/l)
c rgid cvbo cvbpc cvbpn bpcntc ktam20 kno220 tcnit kno320 tcden denoxt
C-----
c522 nut-parm2
```

```
C
     rgid
                  stream parameter group id
С
     brtam_1
                  benthal release rate of ammonia under aerobic condition (mg/m2/hr)
                  benthal release rates of ammonia under anaerobic conditions (mg/m2/hr)
С
    brtam_2
    brpo4_1
                  benthal release rate of ortho-phosphorus under aerobic condition (mg/m2/hr)
С
С
    brpo4 2
                  benthal release rate of ortho-phosphorus under anaerobic condition (mg/m2/hr)
     bnh4(1-3)
                  constant bed concentrations of ammonia-N adsorbed to sand, silt, and clay (mg/kg)
С
                  constant bed concentrations of ortho-phosphorus-P adsorbed to sand, silt, and clay (mg/kg)
     bpo4(1-3)
С
 \texttt{c rgid} \quad \texttt{brtam\_1} \quad \texttt{brtam\_2} \quad \texttt{brpo4\_1} \quad \texttt{brpo4\_2} \quad \texttt{bnh4\_1} \quad \texttt{bnh4\_2} \quad \texttt{bnh4\_3} \quad \texttt{bpo4\_1} \quad \texttt{bpo4\_2} \quad \texttt{bpo4\_3} 
C-----
c523 nut-parm3
С
    rgid
С
                  stream parameter group id
                  concentration of dissolved oxygen below which anaerobic conditions are assumed to exist (mg/l)
    anaer
C
    adnhpm(1-3) adsorption coefficients (Kd) for ammonia-N adsorbed to sand, silt, and clay (cm3/g)
C
    adpopm(1-3) adsorption coefficients for ortho-phosphorus-P adsorbed to sand, silt, and clay (cm3/g)
    expnvg
С
                  exponent in the gas layer mass transfer coefficient equation for NH3 volatilization
                 exponent in the liquid layer mass transfer coefficient equation for NH3 volatilization
С
    expnvl
c rgid anaer adnhpm_1 adnhpm_2 adnhpm_3 adpopm_1 adpopm_2 adpopm_3 expnvg
c524 nut-initial conditions
C
c rgid stream parameter group id
c no3 initial concentration of nitrate (mg/l)
c tam initial concentration of total ammonia (mg/l)
c no2 initial concentration of nitrite (as N) (mg/l)
c po4 initial concentration of ortho-phosphorus (as P) (mg/l)
    rgid
               stream parameter group id
    snh4(1-3) initial suspended concentrations of ammonia-N adsorbed to sand, silt, and clay (mg/kg)
    spo4(1-3) initial suspended concentrations of ortho-phosphorus-P adsorbed to sand, silt, and clay (mg/kg)
C
c rgid no3 tam no2 po4 snh4 1 snh4 2 snh4 3 spo4 1 spo4 2 spo4 3
c---
c530 plank flags
C
С
    phyfg
             phytoplankton flag
   zoofg
balfg
              zooplankton flag
C
С
              benthic algae flag
   sdltfg influence of sediment washload on light extinction flag
C
   amrfg ammonia retardation of nitrogen-limited growth flag
C
   decfg linkage between carbon dioxide and phytoplankton growth flag (if on, the linkage is decoupled) nsfg ammonia is included as part of available nitrogen supply in nitrogen limited growth calculations
С
C
   orefg indicates the oref parameter in card 534 as a flowrate (if = 0) otherwise velocity
С
C
c phyfg zoofg balfg sdltfg amrfg decfg nsfg orefg
C---
c531 plank-parm1
C
C
             stream parameter group id
   ratclp ratio of chlorophyll A content of biomass to phosphorus content
    nonref non-refractory fraction of algae and zooplankton biomass
C
     litsed multiplication factor to total sediment concentration to determine sediment contribution to light
С
extinction (1/mg/ft)
c alnpr fraction of nitrogen requirements for phytoplankton growth that is satisfied by nitrate
             base extinction coefficient for light (1/m)
C
    malgr maximum unit algal growth rate (1/hr)
С
C
c rgid ratclp nonref litsed alnpr extb
                                                     malqr
c532 plank-parm2
С
С
    rgid
             stream parameter group id
    cmmlt Michaelis-Menten constant for light limited growth (lay/min)
С
  cmmn nitrate Michaelis-Menten constant for nitrogen limited growth (mg/l)
C
  cmmnp nitrate Michaelis-Menten constant for phosphorus limited growth (mg/l)
C
             phosphate Michaelis-Menten constant for phosphorus limited growth (mg/l)
С
   talgrh temperature above which algal growth ceases (C)
C
    talgrl temperature below which algal growth ceases (C)
    talgrm temperature below which algal growth is retarded (C)
С
С
c rgid cmmlt cmmn cmmnp cmmp talgrh talgrn talgrm
C-----
c533 plank-parm3
C
           stream parameter group id
С
С
    alr20 algal unit respiration rate at 20 degrees C (1/hr)
    aldh high algal unit death rate (1/hr)
С
     aldl low algal unit death rate (1/hr)
```

```
oxald increment to phytoplankton unit death rate due to anaerobic conditions (1/hr)
C
    naldh inorganic nitrogen concentration below which high algal death rate occurs (as nitrogen) (mg/l)
С
    paldh inorganic phosphorus concentration below which high algal death rate occurs (as phosphorus) (mg/l)
С
                            aldl
c rgid alr20
                   aldh
                                     oxald
                                               naldh
                                                         paldh
c534 plank-parm4
C
    rgid
           stream parameter group id
  phycon constant inflow concentration of plankton from land to reach (mg/l)
C
    seed minimum concentration of plankton not subject to advection (i.e., at high flow) (mg/l)
С
  mxstay concentration of plankton not subject to advection at very low flow (mg/l)
C
   oref velocity/outflow at which the concentration of plankton not subject to advection is midway between
C
SEED and MXSTAY, see card 530 (m/s or m3/s)
  claidh chlorophyll a concentration above which high algal death rate occurs (ug/l)
C
  physet phytoplankton settling rate (m/hr)
C
   refset settling rate for dead refractory organics (m/hr)
    cfsaex This factor is used to adjust the input solar radiation to make it applicable to the RCHRES;
С
            for example, to account for shading of the surface by trees or buildings
C
    mbal maximum benthic algae density (as biomass) (mg/m2) cfbalr ratio of benthic algal to phytoplankton respiration rate
c mbal
С
    cfbalg ratio of benthic algal to phytoplankton growth rate
C
c rgid phycon seed mxstay oref claldh physet refset cfsaex mbal cfbalr cfbalg
c-----
c535 plank-initial conditions
C
С
          stream parameter group id
  phyto initial phytoplankton concentration, as biomass (mg/l)
C
c benal initial benthic algae density, as biomass (mg/m2)
    orn initial dead refractory organic nitrogen concentration (mg/l)
C
           initial dead refractory organic phosphorus concentration (mg/l)
C
    orp
    orc initial dead refractory organic carbon concentration (mg/l)
C
c rgid phyto benal orn
                              orp
                                     orc
c540 pH controls
C
С
    phffgl value of 0 indicates that the removal factor for total inorganic carbon is constant, given as
phfrc1
  a value of 1 indicates the monthly removal factors
C
    phffg2 value of 0 indicates that the removal factor for dissolved carbon dioxide is constant, given as
phfrc2
С
            a value of 1 indicates the monthly removal factors
    phfrc1 removal fraction for total inorganic carbon
phfrc2 removal fraction for dissolved carbon dioxide
C
C
    phfrc2
C
c phffgl phffg2 phfrcl phfrc2
c541 pH-parm
    raid
            stream parameter group id
C
    phont maximum number of iterations used to solve for the pH
С
С
    alkcon number of the conservative substance which is used to simulate alkalinity
C
           Alkalinity must be simulated in order to obtain valid results
    cfcinv ratio of the carbon dioxide invasion rate to the oxygen reaeration rate
C
C
    brco2_1 benthal release rate of CO2 (as carbon) for aerobic conditions (mg/m2/hr)
  brco2_2 benthal release rate of CO2 (as carbon) for anaerobic conditions (mg/m2/hr)
C
c rgid phcnt alkcon cfcinv brco2_1 brco2_2
C----
c542 pH-initial conditions
C
С
    rgid stream parameter group id
   tic initial total inorganic carbon (mg/l)
    co2 initial carbon dioxide (as carbon) (mg/l)
C
    ph initial pH
С
c rgid tic co2 ph
C----
c543 mon-tic (monthly removal fraction for total inorganic carbon)
  only required if phfg = 1 and phffg1 = 1 (see card 502 and card 540)
C
С
    rgid stream parameter group id
   jan-dec total inorganic carbon removal fraction at the start of each month
C
c rgid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c544 mon-co2 (monthly removal fraction for dissolved carbon dioxide)
```

```
only required if phfq = 1 and phffq2 = 1 (see card 502 and card 540)
C
С
С
            stream parameter group id
     jan-dec dissolved carbon dioxide removal fraction at the start of each month
C
c rgid jan feb mar apr may jun jul aug sep oct nov dec
c600 TMDL control flags
                 if > 0 then use point sources control card 660
C
С
     ncland
                 if > 0 then use landuse control card 670
                 if = 1 then apply reduction to only surface output
C
                 if = 2 then apply reduction to total land output
С
                 if > 0 then use reach control card 685 and 690
C
    ntrqp
                number of threshold groups in Card 410 and 610
C
              number of defined thresholds for analysis
    ntnum
C
                 if > 0 then use threshold control cards 605 and 610
С
    ncpt ncland ncrch ntrgp ntnum
     0 2 0 1 1
      .____
c605 TMDL threshold mapping (used if ntnum > 0 in card 600)
                threshold ordinal number
C
     tnum
С
                threshold qual (1 for dissolved only and 2 for total)
     tqsd
     tcount number of water quality constituent to aggregate
C
C
              list of tqid to aggregate - number of tqid in list = tcount (GQUAL/RQUAL IDs)
C
                    tcount tqid1 tqid2
C
     tnum tqsd
                                              ..... tqidn
            2 1 100
C--
c610 TMDL threshold definitions (used if ntnum > 0 in card 600)
C
                threshold reach group ID (corresponds to trgid on Card 410)
С
     traid
                threshold number (corresponds to tnum on Card 605)
С
     tnum
                threshold type (possible values: 0, 1, 2, 3 or -1, -2, -3)
C
     ttype
                 0 = no standard to be applied for the trgid
                 1 = instantaneous values > threshold
С
С
                 2 = arithmetic mean > threshold
                 3 = geometric mean > threshold
C
С
                -1 = instantaneous values < threshold</pre>
С
                -2 = arithmetic mean < threshold
                -3 = geometric mean < threshold
C
С
                number of days over model output is aggregated and/or is compared
                if tdays = 0 then threshold becomes percent of time
С
C
     jan-dec
                twelve monthly values for threshold (for constant, use same value 12 times)
                (units are same as in card 250)
C
С
С
     examples: ttype tdays description/interpretation
                        1 at least one instantaneous value within a 1-day running period > threshold
С
                   1
                          1 at least one instantaneous value within a 1-day running period < threshold
C
                          0 percent of time that instantaneous value > threshold
                   1
C
С
                           4 4-day running arithmetic mean > threshold
C
                          30 30-day running geometric mean > threshold (for previous 30-days)
C

    trgid
    tnum
    ttype
    tdays
    jan
    feb
    mar
    apr
    may
    jun
    jul
    aug
    sep
    oct
    nov

    1
    1
    1
    0
    0.000000
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C---
c660 TMDL point source control (used if ncpt > 0 on card 600)
C
    rchid reach id
permit point source index (level1)
pipe point source index
С
С
                   point source index qualifier (level2)
С
    reduction reduction of pollutant from point source (in fraction)
C
   rchid permit pipe reduction_flow...reduction_qual1...reduction_qual2...reduction_qualn
С
C--
c670 TMDL land-based control (used if ncland > 0 on card 600)
С
                subwatershed id
С
     subbasin
С
     deluid land use id
                land use name
C
     luname
С
     reduction reduction of pollutant from corresponding landuse and subwatershed
       sin deluid pluname reduction
6665 1000 Road_Freeway-All-All-All 0.000000
0.000000 0.0000000
c subbasin deluid pluname reduction
                                                                       0.000000
                                                                                      0.000000
                                                                                                       0.000000
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Road_Primary-All-All-All

      0.000000
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6665
      2000
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0.000000
             0.000000 0.000000
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6665
      3000
             Road_Minor-All-All-All 0.000000 0.000000 0.000000 0.000000
0.000000
             0.000000
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             Dev_ResHigh-All-All-All
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0.000000
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6665
      5000
             Dev_ResLow-All-All-All 0.000000 0.000000 0.000000
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             0.000000 0.000000 0.000000 0.000000
             Dev_Com-All-All 0.000000 0.000000 0.000000
      6000
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6665
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6665 7000
             Dev_Ind-Al1-Al1 0.000000 0.000000 0.000000 0.000000
0.000000
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6665 8000
             Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
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             0.000000 0.000000 0.000000 0.000000
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             Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
6665 9000
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6665 10000
             Dev_Overspray-All-All-All
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             Dev_Irrigated-A-Low-Confined 0.000000
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6665 11111
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6665 11112
             Dev_Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
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6665 11121
             Dev_Irrigated-A-Med-Confined
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             Dev_Irrigated-A-Med-Unconfined 0.000000 0.000000 0.000000
6665 11122
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6665 11211
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             Dev_Irrigated-B-Low-Confined
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6665 11212
             Dev_Irrigated-B-Low-Unconfined
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6665 11221
             Dev Irrigated-B-Med-Confined
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             Dev_Irrigated-B-Med-Unconfined 0.000000 0.000000 0.000000
6665 11222
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6665 11311
             Dev_Irrigated-C-Low-Confined
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6665 11312
             Dev_Irrigated-C-Low-Unconfined 0.000000 0.000000 0.000000
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6665 11321
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             Dev_Irrigated-C-Med-Confined
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6665 11322
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             Dev_Irrigated-C-Med-Unconfined
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6665 11411
             Dev Irrigated-D-Low-Confined
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6665 11412
             Dev Irrigated-D-Low-Unconfined
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6665 11421
             Dev_Irrigated-D-Med-Confined
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6665 11422
             Dev_Irrigated-D-Med-Unconfined
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6665 12111
             Dev_Pervious-A-Low-Confined
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6665 12112
             Dev_Pervious-A-Low-Unconfined 0.000000
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             Dev_Pervious-A-Med-Confined
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6665 12121
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6665 12122
             Dev Pervious-A-Med-Unconfined 0.000000
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6665 12211
             Dev Pervious-B-Low-Confined
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6665 12212
             Dev_Pervious-B-Low-Unconfined 0.000000
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             Dev_Pervious-B-Med-Confined
6665 12221
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6665
     12222
             Dev_Pervious-B-Med-Unconfined 0.000000
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6665 12311
             Dev_Pervious-C-Low-Confined
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6665 12321
             Dev Pervious-C-Med-Confined
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6665 12322
             Dev Pervious-C-Med-Unconfined 0.000000
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6665 12411
             Dev_Pervious-D-Low-Confined
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             Dev_Pervious-D-Low-Unconfined 0.000000
6665 12412
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6665 12421					
	Dev_Pervious-D-Med-Confined	0.000000	0.000000	0.00000	0.000000
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6665 12422	Dev_Pervious-D-Med-Unconfined		0.000000	0.00000	0.000000
	_				0.00000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13111	Agriculture-A-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13112	Agriculture-A-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6665 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.00000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13122	Agriculture-A-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.00000	0.000000
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6665 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
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0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.00000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13232	Agriculture-B-High-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	3				
	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
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6665 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6665 13321	Agriculture-C-Med-Confined	0.000000	0.000000	0.00000	0.000000
	3				0.00000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13331	Agriculture-C-High-Confined	0.000000	0.000000	0.00000	0.000000
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6665 13411	Agriculture-D-Low-Confined	0.000000	0.000000	0.00000	0.000000
	-				0.00000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6665 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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6665 13421	Agriculture-D-Med-Confined	0.000000	0.000000	0.00000	0.000000
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6665 13422	Agriculture-D-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
	_				0.00000
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6665 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.00000	0.000000
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6665 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.00000	0.000000
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6665 14121	Veg_Low-A-Med-Confined 0.00000			.000000 0.000	1000
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0.000000 6665 14122 0.000000 6665 14131 0.000000 6665 14132 0.000000 6665 14221	0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
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15121 Veg_High-A-Med-Confined
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6665 15122
            Veg_High-A-Med-Unconfined
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            Veg_High-A-High-Confined
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6665 15131
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6665 15132
           Veg_High-A-High-Unconfined
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6665 15221
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           Veg_High-B-Med-Confined
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6665 15222
           Veg_High-B-Med-Unconfined
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6665 15231
           Veg_High-B-High-Confined
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6665 15232
           Veg_High-B-High-Unconfined
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6665 15321
            Veg_High-C-Med-Confined
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            Veg_High-C-Med-Unconfined
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6665 15322
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            0.00000 0.000000
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6665 15331
           Veg_High-C-High-Confined
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6665 15332
           Veg_High-C-High-Unconfined
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6665 15421
           Veg_High-D-Med-Confined
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            0.000000 0.000000
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6665 15422
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           Veg_High-D-Med-Unconfined
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6665 15431
           Veg_High-D-High-Confined
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6665 15432
            Veg High-D-High-Unconfined
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6665 16000
            Water-All-All 0.000000 0.000000 0.000000 0.000000
            0.000000 0.000000
                                   0.000000 0.000000
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0.000000
6671 1000
            Road_Freeway-All-All-All
                                    0.000000
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            0.000000 0.000000
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6671 2000
           Road_Primary-All-All-All
                                    0.000000
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0.000000
            0.000000 0.000000
                                    0.000000
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           Road_Minor-All-All-All0.000000 0.000000 0.000000 0.000000
6671 3000
0.000000
            0.000000
                                                            0.000000
6671 4000
           Dev_ResHigh-All-All-All
                                               0.000000
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0.000000
            0.000000 0.000000
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           Dev ResLow-All-All-All0.000000 0.000000 0.000000 0.000000
6671 5000
            0.000000
6671 6000
           Dev Com-All-All 0.000000 0.000000 0.000000 0.000000
            0.000000 0.000000 0.000000 0.000000 0.000000
0.000000
6671 7000
            Dev_Ind-All-All 0.000000 0.000000 0.000000 0.000000
0.000000
            6671 8000
            Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
            0.000000 0.000000 0.000000 0.000000 0.000000
0.000000
6671 9000
            Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
            0.000000
6671 10000
           Dev_Overspray-All-All-All
                                    0.000000
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           Dev_Irrigated-A-Low-Confined 0.000000
0.00000 0.000000 0.000000
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6671 11111
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6671 11112
           Dev Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
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0.00000
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6671 11121
           Dev Irrigated-A-Med-Confined 0.000000
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            0.000000 0.000000
           Dev_Irrigated-A-Med-Unconfined 0.000000 0.000000 0.000000
6671 11122
0.00000
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6671 11211
           Dev_Irrigated-B-Low-Confined
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6671 11212
            Dev_Irrigated-B-Low-Unconfined 0.000000 0.000000 0.000000
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            0.000000 0.000000
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6671 11221
           Dev_Irrigated-B-Med-Confined
                                    0.000000
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6671 11222
           Dev_Irrigated-B-Med-Unconfined 0.000000 0.000000 0.000000

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           Dev_Irrigated-C-Low-Confined 0.000000
6671 11311
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0.000000
            0.000000 0.000000
           Dev_Irrigated-C-Low-Unconfined 0.000000 0.000000 0.000000
6671 11312
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6671 11321
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           Dev_Irrigated-C-Med-Unconfined 0.000000 0.000000 0.000000
6671 11322
0.000000
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6671 11411 0.000000	Dev_Irrigated-D-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 11412	Dev_Irrigated-D-Low-Unconfined			.000000 0.000	0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 11421	Dev_Irrigated-D-Med-Confined	0.000000	0.000000	0.000000	0.00000
0.000000 6671 11422	0.000000 0.000000 Dev_Irrigated-D-Med-Unconfined	0.000000	0.000000	0.000000 .000000 0.000	0000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	0.000000
6671 12111	Dev_Pervious-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6671 12112	Dev_Pervious-A-Low-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 00000
6671 12121 0.000000	Dev_Pervious-A-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 12122	Dev_Pervious-A-Med-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 12211	Dev_Pervious-B-Low-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 12212	Dev_Pervious-B-Low-Unconfined		0.000000	0.000000	0.000000
0.000000 6671 12221	0.000000 0.000000 Dev_Pervious-B-Med-Confined	0.000000	0.000000	0.000000 0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 12222	Dev_Pervious-B-Med-Unconfined		0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 12311	Dev_Pervious-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6671 12312 0.000000	Dev_Pervious-C-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 12321	Dev_Pervious-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6671 12322	Dev_Pervious-C-Med-Unconfined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6671 12411	Dev_Pervious-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6671 12412	0.000000 0.000000 Dev_Pervious-D-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 12421	Dev_Pervious-D-Med-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 12422	Dev_Pervious-D-Med-Unconfined		0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6671 13111 0.000000	Agriculture-A-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 13112	Agriculture-A-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6671 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 13122 0.000000	Agriculture-A-Med-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.00000 0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6671 13222 0.000000	Agriculture-B-Med-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6671 13232	Agriculture-B-High-Unconfined		0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6671 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6671 13312	0.000000 0.000000 Agriculture-C-Low-Unconfined	0.000000	0.000000	0.000000 0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6671 13331 0.000000	Agriculture-C-High-Confined 0.000000 0.000000	0.000000	0.000000	0.000000 0.000000	0.000000
6671 13411	Agriculture-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 13412	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 13421	Agriculture-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6671 13422	0.000000 0.000000 Agriculture-D-Med-Unconfined	0.000000	0.000000	0.000000 0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	3.00000

6671 13431	Agriculture-D-High-Confined	0.000000	0 000000	0 00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 13432	Agriculture-D-High-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 14121	Veg_Low-A-Med-Confined 0.00000				0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0000
6671 14122	Veg Low-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 14131	Veg_Low-A-High-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 14132	Veg_Low-A-High-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 14221	Veg_Low-B-Med-Confined 0.00000				0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0000
6671 14222	Veg_Low-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 14231	Veg_Low-B-High-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 14232	Veg_Low-B-High-Unconfined	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0.00000
6671 14321	Veg_Low-C-Med-Confined 0.00000				0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0000
6671 14322	Veg_Low-C-Med-Unconfined	0.000000	0.000000	0.00000	0.00000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0 000000
6671 14331	Veg_Low-C-High-Confined	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0.00000
6671 14332	Veg_Low-C-High-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 14421	Veg_Low-D-Med-Confined 0.00000				0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 14422	Veg_Low-D-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6671 14431	Veg_Low-D-High-Confined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6671 14432	Veg_Low-D-High-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6671 15121	Veg_High-A-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6671 15122	Veg_High-A-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6671 15131	Veg_High-A-High-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6671 15132	Veg_High-A-High-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 15221	Veg High-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 15222	Veg_High-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 15231	Veq High-B-High-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 15232	Veq High-B-High-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 15321	Veg High-C-Med-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 15322	Veg_High-C-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 15331	Veg_High-C-High-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6671 15332	Veg_High-C-High-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0.00000
			0.000000		0 000000
6671 15421 0.000000	Veg_High-D-Med-Confined	0.000000		0.000000	0.000000
	0.000000 0.000000		0.000000	0.00000	0 000000
6671 15422	Veg_High-D-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0 000000
6671 15431	Veg_High-D-High-Confined	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6671 15432	Veg_High-D-High-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6671 16000	Water-All-All-All 0.00000				0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6673 1000	Road_Freeway-All-All-All	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6673 2000	Road_Primary-All-All-All	0.000000	0.000000	0.000000	0.000000
0.00000			0.00000	0.00000	
	0.000000 0.000000	0.000000			
6673 3000	Road_Minor-All-All-All 0.00000	0 0	.000000 0	.000000 0.00	0000
6673 3000 0.000000	Road_Minor-All-All-All 0.00000 0.000000 0.000000	0.000000	0.000000	0.00000	
6673 3000 0.000000 6673 4000	Road_Minor-All-All-All 0.00000 0.000000 0.000000 Dev_ResHigh-All-All-All	0.000000	.000000 0 0.000000 0.000000	0.000000 0.000000 0.000000	0.00000
6673 3000 0.000000	Road_Minor-All-All-All 0.00000 0.000000 0.000000	0.000000	0.000000	0.00000	

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Dev_ResLow-All-All-All 0.000000 0.000000
6673
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             Dev_Com-All-All 0.000000 0.000000 0.000000
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              Dev_Ind-All-All 0.000000
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6673
      8000
             Dev_Inst-All-All 0.000000 0.000000 0.000000
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              Dev_Roof-All-All-All 0.000000 0.000000
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6673 10000
             Dev_Overspray-All-All-All
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6673 11111
             Dev_Irrigated-A-Low-Confined
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6673 11112
             Dev_Irrigated-A-Low-Unconfined
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             Dev_Irrigated-A-Med-Confined
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6673 11121
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6673 11122
             Dev_Irrigated-A-Med-Unconfined
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6673 11211
             Dev_Irrigated-B-Low-Confined
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6673 11212
             Dev_Irrigated-B-Low-Unconfined
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6673 11221
             Dev_Irrigated-B-Med-Confined
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6673 11222
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             Dev_Irrigated-B-Med-Unconfined
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6673 11311
             Dev_Irrigated-C-Low-Confined
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6673 11312
             Dev Irrigated-C-Low-Unconfined
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6673 11321
             Dev_Irrigated-C-Med-Confined
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6673 11322
             Dev_Irrigated-C-Med-Unconfined 0.000000
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6673 11411
             Dev_Irrigated-D-Low-Confined
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6673 11412
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             Dev_Irrigated-D-Low-Unconfined
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6673 11421
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             Dev_Irrigated-D-Med-Confined
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6673 11422
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             Dev Irrigated-D-Med-Unconfined
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6673 12111
             Dev Pervious-A-Low-Confined
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6673 12112
             Dev_Pervious-A-Low-Unconfined 0.000000
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6673
     12121
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6673 12122
              Dev_Pervious-A-Med-Unconfined 0.000000
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6673 12211
             Dev_Pervious-B-Low-Confined
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6673 12212
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             Dev_Pervious-B-Med-Confined
6673 12221
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6673 12222
             Dev Pervious-B-Med-Unconfined 0.000000
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6673 12311
             Dev_Pervious-C-Low-Confined
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             Dev_Pervious-C-Low-Unconfined 0.000000
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6673
      12321
             Dev_Pervious-C-Med-Confined
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6673 12322
             Dev_Pervious-C-Med-Unconfined 0.000000
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6673 12411
             Dev_Pervious-D-Low-Confined
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6673 12412
             Dev Pervious-D-Low-Unconfined 0.000000
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             Dev Pervious-D-Med-Confined
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6673 12421
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6673 12422
             Dev_Pervious-D-Med-Unconfined 0.000000
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6673 13111
             Agriculture-A-Low-Confined
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6673 13112	Agriculture-A-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6673 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6673 13122	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6673 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6673 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6673 13221	Agriculture-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6673 13222	Agriculture-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6673 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6673 13232	Agriculture-B-High-Unconfined				0.000000
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6673 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6673 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6673 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6673 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6673 13331	Agriculture-C-High-Confined	0.000000	0.000000	0.000000	0.00000
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6673 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6673 13412	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6673 13421	Agriculture-D-Med-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6673 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6673 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6673 13432	Agriculture-D-High-Unconfined		0.00000	0.000000	0.00000
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0.000000 6673 14121	0.000000 0.000000 Veg Low-A-Med-Confined 0.00000	0.000000	0.000000	0.000000 00 0.0	00000
6673 14121	Veg_Low-A-Med-Confined 0.00000	0 0	0.0000	0.0	00000
6673 14121 0.000000	Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000	0.000000	0.00000	0.000000	
6673 14121 0.000000 6673 14122	Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined	0 0 0.000000 0.000000	0.00000 0.000000 0.000000	0.00 0.000000 0.000000	0.00000
6673 14121 0.000000 6673 14122 0.000000	Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000	.000000 0.00000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
6673 14121 0.000000 6673 14122 0.000000 6673 14131	Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined	0 0 0.000000 0.000000 0.000000 0.000000	.000000 0.00000 0.000000 0.000000 0.000000 0.000000	0.00 0.000000 0.000000 0.000000 0.000000	
6673 14121 0.000000 6673 14122 0.000000 6673 14131 0.000000	Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000	0 0 0.000000 0.000000 0.000000 0.000000	.000000 0.00000 0.000000 0.000000 0.000000 0.000000	0.00 0.000000 0.000000 0.000000 0.000000	0.000000
6673 14121 0.000000 6673 14122 0.000000 6673 14131 0.000000 6673 14132	Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00000 0.000000 0.000000 0.000000 0.000000	0.00 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6673 14121 0.000000 6673 14122 0.000000 6673 14131 0.000000 6673 14132 0.000000	Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00000 0.000000 0.000000 0.000000 0.000000	0.00 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6673 14121 0.000000 6673 14122 0.000000 6673 14131 0.000000 6673 14132 0.000000 6673 14221	Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 Veg_Low-A-High-Confined 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.000000 Veg_Low-B-Med-Confined 0.000000 Veg_Low-B-Med-Confined 0.000000 Veg_Low-B-Med-Confined 0.000000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00000 0.000000 0.000000 0.000000 0.000000	0.0 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
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             Dev_ResLow-All-All-All 0.000000
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             Dev_Com-All-All 0.000000 0.000000 0.000000
6674 6000
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             Dev_Ind-All-All 0.000000 0.000000 0.000000
6674 7000
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             Dev Inst-All-All 0.000000 0.000000 0.000000 0.000000
6674 8000
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6674 9000
             Dev Roof-All-All 0.000000 0.000000 0.000000 0.000000
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6674 10000
             Dev_Overspray-All-All-All
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6674 11111
             Dev_Irrigated-A-Low-Confined
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6674 11112
             Dev_Irrigated-A-Low-Unconfined
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6674 11121
             Dev_Irrigated-A-Med-Confined
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             Dev_Irrigated-A-Med-Unconfined
6674 11122
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6674 11211
             Dev_Irrigated-B-Low-Confined
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6674 11212
             Dev Irrigated-B-Low-Unconfined
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6674 11221
             Dev_Irrigated-B-Med-Confined
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6674 11222
             Dev_Irrigated-B-Med-Unconfined
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6674 11311
             Dev_Irrigated-C-Low-Confined
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6674 11312
             Dev_Irrigated-C-Low-Unconfined
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6674 11321
             Dev_Irrigated-C-Med-Confined
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6674 11322
             Dev Irrigated-C-Med-Unconfined
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             Dev_Irrigated-D-Low-Confined
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6674 11411
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6674 11412
             Dev_Irrigated-D-Low-Unconfined
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             Dev_Irrigated-D-Med-Confined
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6674 11421
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6674 11422	Dev_Irrigated-D-Med-Unconfined	i 0	.000000	0.000000 0	.000000
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6674 12111	Dev_Pervious-A-Low-Confined	0.000000	0.00000		0.000000
0.000000	0.000000 0.000000	0.000000	0.000000		0 000000
6674 12112 0.000000	Dev_Pervious-A-Low-Unconfined 0.000000 0.000000	0.000000	0.000000		0.000000
6674 12121	Dev_Pervious-A-Med-Confined	0.000000	0.000000		0.000000
0.000000	0.000000 0.000000	0.000000	0.000000		
6674 12122	Dev_Pervious-A-Med-Unconfined	0.000000	0.000000		0.000000
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6674 12211	Dev_Pervious-B-Low-Confined	0.000000	0.000000		0.000000
0.000000 6674 12212	0.000000 0.000000 Dev_Pervious-B-Low-Unconfined	0.000000	0.000000		0.000000
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6674 12221	Dev_Pervious-B-Med-Confined	0.000000	0.000000		0.000000
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6674 12222	Dev_Pervious-B-Med-Unconfined		0.000000		0.000000
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6674 12311 0.000000	Dev_Pervious-C-Low-Confined 0.000000 0.000000	0.000000	0.000000		0.000000
6674 12312	Dev_Pervious-C-Low-Unconfined		0.000000		0.000000
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6674 12321	Dev_Pervious-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6674 12322	Dev_Pervious-C-Med-Unconfined		0.000000		0.000000
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6674 12411 0.000000	Dev_Pervious-D-Low-Confined 0.000000 0.000000	0.000000	0.000000		0.000000
6674 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.000000		0.000000
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6674 12421	Dev_Pervious-D-Med-Confined	0.000000	0.000000		0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6674 12422	Dev_Pervious-D-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6674 13111	Agriculture-A-Low-Confined	0.000000	0.000000		0.000000
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6674 13112 0.000000	Agriculture-A-Low-Unconfined 0.000000 0.000000	0.000000	0.000000		0.000000
6674 13121	Agriculture-A-Med-Confined	0.000000	0.000000		0.000000
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6674 13122	Agriculture-A-Med-Unconfined	0.000000	0.000000		0.000000
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6674 13211	Agriculture-B-Low-Confined	0.000000	0.000000		0.000000
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6674 13212 0.000000	Agriculture-B-Low-Unconfined 0.000000 0.000000	0.000000	0.000000		0.000000
6674 13221	Agriculture-B-Med-Confined	0.000000	0.000000		0.00000
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6674 13222	Agriculture-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6674 13231	Agriculture-B-High-Confined	0.000000	0.000000		0.000000
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6674 13232	Agriculture-B-High-Unconfined 0.000000 0.000000		0.000000		0.000000
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6674 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000		0.000000
0.000000	0.000000 0.000000	0.000000	0.000000		
6674 13321	Agriculture-C-Med-Confined	0.000000	0.000000		0.000000
0.000000	0.000000 0.000000	0.000000	0.000000		
6674 13322	Agriculture-C-Med-Unconfined	0.000000	0.000000		0.000000
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6674 13331 0.000000	Agriculture-C-High-Confined 0.000000 0.000000	0.000000	0.000000		0.00000
6674 13411	Agriculture-D-Low-Confined	0.000000	0.000000		0.000000
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6674 13412	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6674 13421	Agriculture-D-Med-Confined	0.000000	0.000000		0.000000
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6674 13422 0.000000	Agriculture-D-Med-Unconfined 0.000000 0.000000	0.000000	0.000000		0.00000
6674 13431	Agriculture-D-High-Confined	0.000000	0.000000		0.000000
0.000000	0.000000 0.000000	0.000000	0.000000		3.300000
6674 13432	Agriculture-D-High-Unconfined		0.000000		0.000000
0.000000	0.000000 0.000000	0.000000	0.000000		
6674 14121	Veg_Low-A-Med-Confined 0.00000				.000000
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6674
       14122 Veg_Low-A-Med-Unconfined
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              Veg_Low-A-High-Confined
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6674
      14131
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      14132
              Veg_Low-A-High-Unconfined
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              Veg_Low-B-Med-Confined 0.000000
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     14222
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6674 14231
              Veg_Low-B-High-Confined
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6674 14232
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              Veg_Low-B-High-Unconfined
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6674 14321
              Veg_Low-C-Med-Confined 0.000000
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6674 14322
              Veg_Low-C-Med-Unconfined
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6674
     14331
              Veg_Low-C-High-Confined
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     14332
              Veg_Low-C-High-Unconfined
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              Veg_Low-D-Med-Confined 0.000000
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6674 14422
              Veg_Low-D-Med-Unconfined
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              Veg_Low-D-High-Confined
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6674 14431
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              Veg_Low-D-High-Unconfined
6674 14432
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6674 15121
              Veg High-A-Med-Confined
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6674 15122
              Veg_High-A-Med-Unconfined
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     15131
              Veg_High-A-High-Confined
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6674 15132
              Veg_High-A-High-Unconfined
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6674 15221
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              Veg_High-B-Med-Confined
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6674 15222
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              Veg_High-B-Med-Unconfined
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6674 15231
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6674 15232
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6674 15321
              Veg_High-C-Med-Confined
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6674 15331
              Veg_High-C-High-Confined
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6674 15332
              Veg_High-C-High-Unconfined
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              Veg_High-D-Med-Confined
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6674 15421
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6674 15422
              Veg_High-D-Med-Unconfined
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6674 15431
              Veg_High-D-High-Confined
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6674 15432
              Veg_High-D-High-Unconfined
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6674
      16000
              Water-All-All 0.000000
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6675
      1000
              Road_Freeway-All-All-All
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6675
      2000
              Road_Primary-All-All-All
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              Road_Minor-All-All-All 0.000000
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6675
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              Dev_ResHigh-All-All-All
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6675 5000
              Dev ResLow-All-All-All 0.000000
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6675 6000
              Dev_Com-All-All 0.000000 0.000000 0.000000 0.000000
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6675 7000
              Dev_Ind-All-All 0.000000 0.000000 0.000000 0.000000
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6675 8000	Dev_Inst-All-All-All 0.00000	0.00	0000 0.000	0.00	0000
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6675 9000 0.000000	Dev_Roof-All-All-All 0.00000 0.000000 0.000000	0.000000	0.000	0.000	0000
6675 10000	Dev_Overspray-All-All-All	0.000000	0.000000	0.000000	0.000000
0.000000 6675 11111	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6675 11111 0.000000	Dev_Irrigated-A-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6675 11112	Dev_Irrigated-A-Low-Unconfined				
0.000000 6675 11121	0.000000 0.000000 Dev Irrigated-A-Med-Confined	0.000000	0.000000	0.00000 0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0.00000
6675 11122 0.000000	Dev_Irrigated-A-Med-Unconfined 0.000000 0.000000	d 0.000 0.000000	0.00000	0.00000	0.000
6675 11211	Dev_Irrigated-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6675 11212 0.000000	Dev_Irrigated-B-Low-Unconfined 0.000000 0.000000	d 0.000 0.000000	0.00000	0.00000	0.00000
6675 11221	Dev_Irrigated-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6675 11222	0.000000 0.000000	0.000000	0.000000 0000 0.000	0.000000	0000
0.000000	Dev_Irrigated-B-Med-Unconfined 0.000000 0.000000	d 0.00 0.000000	0.000000	0.00000	0.000000
6675 11311	Dev_Irrigated-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000 6675 11312	0.000000 0.000000 Dev Irrigated-C-Low-Unconfined	0.0000000 d 0.00	0.000000 0000 0.000	0.000000	0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6675 11321	Dev_Irrigated-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6675 11322	0.000000 0.000000 Dev_Irrigated-C-Med-Unconfined	0.000000.0 d 0.00	0.000000 0000 0.000	0.000000	0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6675 11411	Dev_Irrigated-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6675 11412	0.000000 0.000000 Dev_Irrigated-D-Low-Unconfined	0.000000 d 0.00	0.000000 0000 0.000	0.000000	0000
0.00000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6675 11421	Dev_Irrigated-D-Med-Confined	0.000000	0.000000	0.000000	0.00000
0.000000 6675 11422	0.000000 0.000000 Dev_Irrigated-D-Med-Unconfined	0.000000 d 0.00	0.000000 0000 0.000	0.000000	0000
0.00000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6675 12111 0.000000	Dev_Pervious-A-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6675 12112	Dev_Pervious-A-Low-Unconfined	0.000000	0.000000	0.000000 0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6675 12121 0.000000	Dev_Pervious-A-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000 0.000000	0.000000
6675 12122	Dev_Pervious-A-Med-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6675 12211 0.000000	Dev_Pervious-B-Low-Confined 0.000000 0.000000	0.000000	0.000000 0.000000	0.000000	0.000000
6675 12212	Dev_Pervious-B-Low-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6675 12221 0.000000	Dev_Pervious-B-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.00000 0.00000	0.000000
6675 12222	Dev_Pervious-B-Med-Unconfined		0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6675 12311 0.000000	Dev_Pervious-C-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.00000 0.00000	0.000000
6675 12312	Dev_Pervious-C-Low-Unconfined	0.00000	0.000000	0.000000	0.000000
0.000000 6675 12321	0.000000 0.000000 Dev Pervious-C-Med-Confined	0.000000	0.000000 0.000000	0.00000 0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6675 12322	Dev_Pervious-C-Med-Unconfined		0.00000	0.000000	0.00000
0.000000 6675 12411	0.000000 0.000000 Dev_Pervious-D-Low-Confined	0.000000	0.000000 0.000000	0.00000 0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6675 12412	Dev_Pervious-D-Low-Unconfined		0.000000	0.000000	0.000000
0.000000 6675 12421	0.000000 0.000000 Dev_Pervious-D-Med-Confined	0.000000	0.000000 0.000000	0.00000 0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6675 12422	Dev_Pervious-D-Med-Unconfined		0.000000	0.000000	0.000000
0.000000 6675 13111	0.000000 0.000000 Agriculture-A-Low-Confined	0.000000	0.000000 0.000000	0.00000 0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6675 13112	Agriculture-A-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
0.000000 6675 13121	Agriculture-A-Med-Confined	0.000000	0.000000 0.000000	0.00000 0.00000	0.000000
0.00000	0.000000 0.000000	0.00000	0.000000	0.000000	
6675 13122 0.000000	Agriculture-A-Med-Unconfined 0.000000 0.000000	0.000000	0.000000 0.000000	0.00000 0.00000	0.000000
0.00000	0.000000	0.000000	0.00000	0.00000	

6675 13211 0.000000					
0.000000	Agriculture-B-Low-Confined	0.000000	0.00000	0.00000	0.000000
	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6675 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.000000	0.000000
					0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000			
			0.00000	0.000000	
6675 13231	Agriculture-B-High-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6675 13232	Agriculture-B-High-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 13311	Agriculture-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 13312	Agriculture-C-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
	5				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6675 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6675 13331	Agriculture-C-High-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.000000	0.000000
	-				0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6675 13421	Agriculture-D-Med-Confined	0.000000	0.00000	0.00000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.00000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6675 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6675 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
			.000000 0.000		0000
6675 14121	Veg_Low-A-Med-Confined 0.00000				0000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 14122	Veg_Low-A-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.000000	0.000000
	<u>-</u>				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 14132	Veg_Low-A-High-Unconfined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 14221	Veg_Low-B-Med-Confined 0.00000	0 0	.000000 0.000	0.00	0000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6675 14222	Veg_Low-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6675 14231					0 000000
	Veg_Low-B-High-Confined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6675 14232	Veg_Low-B-High-Unconfined	0.000000	0 000000		
		0.00000		0 000000	0 000000
0.000000			0.00000	0.00000	0.000000
	0.000000 0.000000	0.000000	0.00000	0.000000	0.00000
6675 14321			0.00000	0.000000	
6675 14321	Veg_Low-C-Med-Confined 0.00000	0 0	0.000000	0.000000 000 0.00	
0.00000	Veg_Low-C-Med-Confined 0.00000 0.000000	0.000000	0.000000 .000000 0.000 0.000000	0.000000 000 0.00 0.000000	0000
	Veg_Low-C-Med-Confined 0.00000	0 0	0.000000	0.000000 000 0.00	
0.000000 6675 14322	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined	0 0 0.000000 0.000000	0.000000 .000000 0.000 0.000000 0.000000	0.000000 000 0.00 0.000000 0.000000	0000
0.000000 6675 14322 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 .000000 0.0000 0.000000 0.000000 0.000000	0.000000 000 0.00 0.000000 0.000000 0.000000	0.00000
0.000000 6675 14322 0.000000 6675 14331	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined	0.000000 0.000000 0.000000 0.000000	0.000000 .000000 0.0000 0.000000 0.000000 0.000000	0.000000 000 0.00 0.000000 0.000000 0.000000	0000
0.000000 6675 14322 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 .000000 0.0000 0.000000 0.000000 0.000000	0.000000 000 0.00 0.000000 0.000000 0.000000	0.00000
0.000000 6675 14322 0.000000 6675 14331 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000	0 0 0.000000 0.000000 0.000000 0.000000	0.000000 .000000 0.000000 0.000000 0.000000	0.000000 000 0.00 0.000000 0.000000 0.000000 0.000000	0.000000
0.000000 6675 14322 0.000000 6675 14331 0.000000 6675 14332	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 .000000 0.000000 0.000000 0.000000	0.000000 000 0.00 0.000000 0.000000 0.000000 0.000000 0.000000	0.00000
0.000000 6675 14322 0.000000 6675 14331 0.000000 6675 14332 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 .000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
0.000000 6675 14322 0.000000 6675 14331 0.000000 6675 14332 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 .000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
0.000000 6675 14322 0.000000 6675 14331 0.000000 6675 14332 0.000000 6675 14421	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 .000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
0.000000 6675 14322 0.000000 6675 14331 0.000000 6675 14332 0.000000 6675 14421 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 0.000000 0.000000 0.000000 0.000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.000000 .000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
0.000000 6675 14322 0.000000 6675 14331 0.000000 6675 14332 0.000000 6675 14421 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 0.000000 0.000000 0.000000 0.000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.000000 .000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
0.000000 6675 14322 0.000000 6675 14331 0.000000 6675 14332 0.000000 6675 14421 0.000000 6675 14422	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Unconfined	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.000000 .000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
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0.000000 6675 14322 0.000000 6675 14331 0.000000 6675 14332 0.000000 6675 14421 0.000000 6675 14422	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Unconfined	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.000000 .000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
0.000000 6675 14322 0.000000 6675 14331 0.000000 6675 14332 0.000000 6675 14421 0.000000 6675 14422 0.000000 6675 14431	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.000000 .000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000
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6684 1000
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6684 2000
            Road_Primary-All-All-All
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6684 3000
            Road_Minor-All-All-All0.000000 0.000000 0.000000 0.000000
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6684 4000
            Dev_ResHigh-All-All-All
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6684 5000
            Dev ResLow-All-All 0.000000 0.000000 0.000000
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6684 6000
            Dev_Com-All-All 0.000000 0.000000 0.000000 0.000000
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6684 7000
            Dev_Ind-All-All 0.000000 0.000000 0.000000 0.000000
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6684 8000
            Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
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            Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
6684 9000
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6684 10000
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            Dev_Overspray-All-All-All
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6684 11112
            Dev Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
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6684 11121
            Dev_Irrigated-A-Med-Confined 0.000000
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6684 11122
            Dev_Irrigated-A-Med-Unconfined 0.000000 0.000000 0.000000
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6684 11211
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            Dev_Irrigated-B-Low-Confined 0.000000
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6684 11212
            Dev_Irrigated-B-Low-Unconfined 0.000000 0.000000 0.000000
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            Dev_Irrigated-B-Med-Confined
6684 11221
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6684 11222
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6684 11311
            Dev Irrigated-C-Low-Confined
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            Dev_Irrigated-C-Low-Unconfined 0.000000 0.000000 0.000000
6684 11312
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6684 11321
            Dev_Irrigated-C-Med-Confined
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6684 11322
            Dev_Irrigated-C-Med-Unconfined 0.000000 0.000000 0.000000
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6684 11411
            Dev_Irrigated-D-Low-Confined
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6684 11412
            Dev_Irrigated-D-Low-Unconfined 0.000000 0.000000 0.000000

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6684 11421
            Dev Irrigated-D-Med-Confined
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6684 11422
            Dev_Irrigated-D-Med-Unconfined 0.000000 0.000000 0.000000
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6684 12111
            Dev_Pervious-A-Low-Confined
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            Dev_Pervious-A-Low-Unconfined 0.000000
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6684 12112
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6684 12121	Dev_Pervious-A-Med-Confined	0.000000	0.00000	0.00000	0.00000
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6684 12122	Dev_Pervious-A-Med-Unconfined		0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 12211	Dev_Pervious-B-Low-Confined	0.000000	0.00000	0.00000	0.000000
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6684 12212	Dev_Pervious-B-Low-Unconfined	0.000000	0.00000	0.00000	0.00000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6684 12221	Dev_Pervious-B-Med-Confined	0.000000	0.00000	0.00000	0.000000
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6684 12222	Dev_Pervious-B-Med-Unconfined		0.00000	0.00000	0.000000
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6684 12311	Dev_Pervious-C-Low-Confined	0.000000	0.00000	0.00000	0.000000
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6684 12312	Dev_Pervious-C-Low-Unconfined	0.000000	0.00000	0.00000	0.00000
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6684 12321	Dev_Pervious-C-Med-Confined	0.000000	0.00000	0.00000	0.000000
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6684 12322	Dev_Pervious-C-Med-Unconfined	0 000000	0.00000	0.00000	0.000000
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6684 12411	Dev_Pervious-D-Low-Confined	0.000000	0.00000	0.00000	0.00000
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6684 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
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6684 12421	Dev_Pervious-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6684 12422	Dev_Pervious-D-Med-Unconfined	0 000000	0.00000	0.00000	0.000000
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6684 13111	Agriculture-A-Low-Confined	0.000000	0.00000	0.00000	0.000000
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6684 13112	Agriculture-A-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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6684 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.00000	0.000000
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6684 13122	Agriculture-A-Med-Unconfined	0.000000	0.00000	0.00000	0.00000
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6684 13211	Agriculture-B-Low-Confined	0.000000	0.00000	0.00000	0.000000
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6684 13212	Agriculture-B-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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6684 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.00000	0.000000
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6684 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6684 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.00000	0.000000
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6684 13232	Agriculture-B-High-Unconfined		0.000000	0.00000	0.000000
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6684 13311	Agriculture-C-Low-Confined	0.000000	0.00000	0.00000	0.000000
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6684 13312	Agriculture-C-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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	Agriculture-C-Med-Confined				0 000000
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6684 13322	Agriculture-C-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
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6684 13331	Agriculture-C-High-Confined	0.000000	0.00000	0.00000	0.000000
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6684 13411	Agriculture-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6684 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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6684 13421	Agriculture-D-Med-Confined	0.000000	0.00000	0.00000	0.000000
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6684 13422	Agriculture-D-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6684 13431	Agriculture-D-High-Confined	0.000000	0.000000	0.00000	0.000000
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6684 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.00000	0.000000
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6684 14121	Veg_Low-A-Med-Confined 0.00000			0.000	UUUU
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6684 14122			0.00000	0.00000	5.00000
6684 14122	Veg_Low-A-Med-Unconfined		0 000000	0 000000	
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6684
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               Veg_Low-B-Med-Confined 0.000000
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      14331
               Veg_Low-C-High-Confined
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6684
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               Veg_Low-C-High-Unconfined
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               Veg_Low-D-Med-Unconfined
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               Veg_High-C-Med-Confined
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               Veg_High-C-High-Confined
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               Veg_High-C-High-Unconfined
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6684
       15421
               Veg_High-D-Med-Confined
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6684
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               Veg_High-D-Med-Unconfined
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      15431
               Veg_High-D-High-Confined
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6684
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               Water-All-All-All
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6839
       1000
               Road_Freeway-All-All-All
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6839
       2000
               Road_Primary-All-All-All
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               Road_Minor-All-All-All 0.000000
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6839
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6839
       4000
               Dev_ResHigh-All-All-All
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6839
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               Dev_ResLow-All-All-All 0.000000
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6839
               Dev_Com-All-All-All
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               Dev_Ind-All-All 0.000000
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               Dev Inst-All-All 0.000000
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6839
      9000
               Dev_Roof-All-All-All 0.000000
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6839
               Dev_Overspray-All-All-All
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6839 11111	Dev_Irrigated-A-Low-Confined		0.000000	0.000000	0.000000
0.000000 6839 11112	0.000000 0.000000 Dev_Irrigated-A-Low-Unconfined	000000.0 0 E	0.000000	0.000000	0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 11121 0.000000	Dev_Irrigated-A-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 11122	Dev_Irrigated-A-Med-Unconfined			0.00000	0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 11211 0.000000	Dev_Irrigated-B-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 11212	Dev_Irrigated-B-Low-Unconfined	0 E	.000000 0.0	0.000	
0.000000 6839 11221	0.000000 0.000000 Dev Irrigated-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 11222	Dev_Irrigated-B-Med-Unconfined			0.000	
0.000000 6839 11311	0.000000 0.000000 Dev_Irrigated-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.000000	
6839 11312 0.000000	Dev_Irrigated-C-Low-Unconfined 0.000000 0.000000	0.000000	0.00000	0.00000	0.00000
6839 11321	Dev_Irrigated-C-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.000000 6839 11322	0.000000 0.000000 Dev_Irrigated-C-Med-Unconfined	0.000000	0.000000	0.000000	2000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	0.000000
6839 11411	Dev_Irrigated-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6839 11412	0.000000 0.000000 Dev_Irrigated-D-Low-Unconfined	0.000000 d 6	0.000000	0.000000 0.000 0.000	0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0.000000
6839 11421 0.000000	Dev_Irrigated-D-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 11422	Dev_Irrigated-D-Med-Unconfined			0.000	0000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 12111 0.000000	Dev_Pervious-A-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 12112	Dev_Pervious-A-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000 6839 12121	0.000000 0.000000 Dev_Pervious-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 12122 0.000000	Dev_Pervious-A-Med-Unconfined 0.000000 0.000000		0.000000	0.000000	0.000000
6839 12211	Dev_Pervious-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6839 12212 0.000000	Dev_Pervious-B-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000 0.000000	0.000000
6839 12221	Dev_Pervious-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6839 12222	0.000000 0.000000 Dev_Pervious-B-Med-Unconfined	0.000000	0.000000	0.000000 0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	0.00000
6839 12311	Dev_Pervious-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6839 12312	0.000000 0.000000 Dev_Pervious-C-Low-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6839 12321 0.000000	Dev_Pervious-C-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 12322	Dev_Pervious-C-Med-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 12411 0.000000	Dev_Pervious-D-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000 6839 12421	0.000000 0.000000 Dev_Pervious-D-Med-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6839 12422	Dev_Pervious-D-Med-Unconfined		0.000000	0.000000	0.000000
0.000000 6839 13111	0.000000 0.000000 Agriculture-A-Low-Confined	0.000000	0.000000	0.000000 0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6839 13112 0.000000	Agriculture-A-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000 0.000000	0.000000
6839 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.000000 6839 13122	0.000000 0.000000 Agriculture-A-Med-Unconfined	0.000000	0.000000	0.00000 0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	0.00000
6839 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6839 13212	0.000000 0.000000 Agriculture-B-Low-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6839 13221 0.000000	Agriculture-B-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
0.00000	0.00000	0.000000	0.00000	0.00000	

6839 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 13231	Agriculture-B-High-Confined	0.000000	0.00000	0.000000	0.00000
	2				0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13232	Agriculture-B-High-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13311	Agriculture-C-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6839 13312	Agriculture-C-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6839 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.000000	0.000000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 13331	Agriculture-C-High-Confined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.000000	0.000000
	-				0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
					0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 13421	Agriculture-D-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6839 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.000000	0.000000
	2				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13432	Agriculture-D-High-Unconfined	0 000000	0.00000	0.00000	0.000000
	2				0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 14121	Veg_Low-A-Med-Confined 0.00000	0 0	.000000 0.000	0.00	0000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 14122	Veg_Low-A-Med-Unconfined	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6839 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6839 14132	Veg_Low-A-High-Unconfined	0.000000	0.00000	0.000000	0.000000
					0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 14221	Veg_Low-B-Med-Confined 0.00000	0 0	.000000 0.000	0.00	0000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 14222	Veg_Low-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 14231	Veg_Low-B-High-Confined	0.000000	0.00000	0.000000	0.000000
					0.000000
6839 14231 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000	0.000000	0.00000 0.00000	0.000000 0.000000	
6839 14231 0.000000 6839 14232	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.00000 0.00000 0.00000	0.000000
6839 14231 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.00000 0.00000	0.000000 0.000000	
6839 14231 0.000000 6839 14232 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.00000 0.00000 0.00000 0.00000	0.000000 0.000000 0.000000 0.000000	0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 .000000	0.000000 0.000000 0.000000 0.000000 000 0.00	0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 .000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0000 0.000000 0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000 6839 14332	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000 6839 14332 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0000 0.000000 0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000 6839 14332	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0000 0.000000 0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000 6839 14332 0.000000 6839 14421	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0000 0.000000 0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000 6839 14332 0.000000 6839 14421 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 0.0000000 0.0000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0000 0.000000 0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000 6839 14332 0.000000 6839 14421 0.000000 6839 14421	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0000 0.000000 0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000 6839 14332 0.000000 6839 14421 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 0.0000000 0.0000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0000 0.000000 0.000000
6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14331 0.000000 6839 14332 0.000000 6839 14421 0.000000 6839 14422 0.000000	Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.00000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
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6839
      15322
            Veg_High-C-Med-Unconfined
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            Veg_High-C-High-Confined
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6839 15331
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     15332
            Veg_High-C-High-Unconfined
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6839 15421
            Veg_High-D-Med-Confined
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6839
    15422
            Veg_High-D-Med-Unconfined
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6839 15431
            Veg_High-D-High-Confined
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            Veg_High-D-High-Unconfined
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6839 15432
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6839 16000
            Water-All-All-All 0.000000
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6844 1000
            Road_Freeway-All-All-All
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            Road_Primary-All-All-All
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6844 2000
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6844 3000
            Road_Minor-All-All-All 0.000000 0.000000 0.000000 0.000000
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     4000
            Dev_ResHigh-All-All-All
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6844 5000
            Dev_ResLow-All-All-All 0.000000 0.000000 0.000000
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            Dev_Com-All-All 0.000000 0.000000 0.000000
6844 6000
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            Dev_Ind-Al1-Al1 0.000000 0.000000 0.000000 0.000000
6844 7000
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6844 8000
            Dev Inst-All-All 0.000000 0.000000 0.000000
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6844 9000
             Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
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6844 10000
            Dev_Overspray-All-All-All
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6844 11111
            Dev_Irrigated-A-Low-Confined 0.000000
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            Dev_Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
6844 11112
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6844 11121
            Dev_Irrigated-A-Med-Confined 0.000000
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            Dev_Irrigated-A-Med-Unconfined 0.000000 0.000000 0.000000
6844 11122
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6844 11211
            Dev Irrigated-B-Low-Confined
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6844 11212
            Dev_Irrigated-B-Low-Unconfined 0.000000 0.000000 0.000000
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6844 11221
            Dev_Irrigated-B-Med-Confined
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6844 11222
            Dev_Irrigated-B-Med-Unconfined 0.000000 0.000000 0.000000
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6844 11311
            Dev_Irrigated-C-Low-Confined
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6844 11312
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            Dev_Irrigated-C-Med-Confined
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6844 11321
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6844 11322
            Dev Irrigated-C-Med-Unconfined 0.000000 0.000000 0.000000
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6844 11411
            Dev_Irrigated-D-Low-Confined
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            Dev_Irrigated-D-Low-Unconfined 0.000000
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6844 11412
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6844 11421
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            Dev_Irrigated-D-Med-Confined
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6844 11422
            Dev_Irrigated-D-Med-Unconfined
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6844 12111
            Dev Pervious-A-Low-Confined
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6844 12112
            Dev_Pervious-A-Low-Unconfined 0.000000
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6844 12121
            Dev Pervious-A-Med-Confined
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6844 12122
            Dev_Pervious-A-Med-Unconfined 0.000000
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            Dev_Pervious-B-Low-Confined
6844 12211
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6844 12212	Dev_Pervious-B-Low-Unconfined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 12221	Dev_Pervious-B-Med-Confined	0.000000	0.00000	0.000000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 12222	Dev_Pervious-B-Med-Unconfined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 12311	Dev_Pervious-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 12312	Dev_Pervious-C-Low-Unconfined		0.00000	0.000000	0.00000
	_				0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 12321	Dev_Pervious-C-Med-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.00000 0.000000	0.000000	0.00000	0.000000	
6844 12322	Dev_Pervious-C-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 12411	Dev Pervious-D-Low-Confined	0.000000	0.00000	0.000000	0.00000
	<u> </u>				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6844 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 12421	Dev_Pervious-D-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
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6844 12422	Dev_Pervious-D-Med-Unconfined		0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13111	Agriculture-A-Low-Confined	0.000000	0.00000	0.000000	0.000000
	3				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13112	Agriculture-A-Low-Unconfined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13121	Agriculture-A-Med-Confined	0.000000	0.00000	0.000000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13122	Agriculture-A-Med-Unconfined	0.000000	0.00000	0.000000	0.00000
	_				0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13211	Agriculture-B-Low-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13212	Agriculture-B-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.000000	0.000000
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0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13231	Agriculture-B-High-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
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6844 13232	Agriculture-B-High-Unconfined		0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13311	Agriculture-C-Low-Confined	0.000000	0.00000	0.000000	0.00000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13312	Agriculture-C-Low-Unconfined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.000000	0.00000
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0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13331	Agriculture-C-High-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13412	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13421	Agriculture-D-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 13422	Agriculture-D-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6844 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.000000	0.00000
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6844 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.000000	0.00000
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6844 14121	Veg_Low-A-Med-Confined 0.00000		.000000 0.0000		00000
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6844 14122	Veg_Low-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6844 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	,
6844 14132	Veg_Low-A-High-Unconfined	0.000000	0.00000	0.000000	0.000000
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6844 14221	Veg_Low-B-Med-Confined 0.00000		.000000 0.0000		00000
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6844 14222	Veg_Low-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6844 14231	Veg_Low-B-High-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
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6844
       14232
              Veg_Low-B-High-Unconfined
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              Veg_Low-C-Med-Confined 0.000000
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      14322
              Veg_Low-C-Med-Unconfined
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6844
     14331
              Veg_Low-C-High-Confined
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              Veg_Low-C-High-Unconfined
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6844
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6844 14421
              Veg_Low-D-Med-Confined 0.000000
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6844 14422
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              Veg_Low-D-Med-Unconfined
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              Veg_Low-D-High-Confined
6844 14431
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              Veg_Low-D-High-Unconfined
6844 14432
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     15121
              Veg_High-A-Med-Confined
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6844 15122
              Veg_High-A-Med-Unconfined
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6844
     15131
              Veg_High-A-High-Confined
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6844 15132
              Veg_High-A-High-Unconfined
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6844 15221
              Veg_High-B-Med-Confined
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6844 15222
              Veg_High-B-Med-Unconfined
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6844 15231
              Veg_High-B-High-Confined
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6844 15232
              Veg_High-B-High-Unconfined
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     15321
              Veg_High-C-Med-Confined
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6844
     15322
              Veg_High-C-Med-Unconfined
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6844 15331
              Veg_High-C-High-Confined
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              Veg_High-C-High-Unconfined
6844 15332
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6844 15421
              Veg_High-D-Med-Confined
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6844 15422
              Veg High-D-Med-Unconfined
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6844 15431
              Veg_High-D-High-Confined
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6844
      15432
              Veg_High-D-High-Unconfined
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6844
      16000
              Water-All-All-All 0.000000
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6850
     1000
              Road_Freeway-All-All-All
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6850
              Road_Primary-All-All-All
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6850
      3000
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              Road Minor-All-All-All 0.000000
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6850
     4000
              Dev ResHigh-All-All-All
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6850
     5000
              Dev_ResLow-All-All-All 0.000000
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              Dev_Com-All-All-All 0.000000
      6000
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6850
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6850
      7000
              Dev_Ind-All-All 0.000000
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              Dev_Inst-All-All 0.000000 0.000000 0.000000
6850
      8000
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      9000
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              Dev_Roof-All-All-All 0.000000
6850
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     10000
              Dev_Overspray-All-All-All
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6850
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              Dev_Irrigated-A-Low-Confined 0.000000
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6850
     11111
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6850 11112
              Dev_Irrigated-A-Low-Unconfined
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              Dev_Irrigated-A-Med-Confined 0.000000
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6850 11121
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6850 11122	Dev_Irrigated-A-Med-Unconfined	d 0	.000000 0	.000000 0.	000000
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6850 11211 0.000000	Dev_Irrigated-B-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 11212	Dev_Irrigated-B-Low-Unconfined				000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 11221	Dev_Irrigated-B-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.000000 6850 11222	0.000000 0.000000 Dev_Irrigated-B-Med-Unconfined	0.000000	0.000000	0.000000	000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	0.00000
6850 11311	Dev_Irrigated-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6850 11312 0.000000	Dev_Irrigated-C-Low-Unconfined 0.000000 0.000000	0.000000			000000
6850 11321	Dev_Irrigated-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6850 11322	Dev_Irrigated-C-Med-Unconfined				000000
0.000000 6850 11411	0.000000 0.000000 Dev_Irrigated-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6850 11412	Dev_Irrigated-D-Low-Unconfined				000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 11421 0.000000	Dev_Irrigated-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
6850 11422	0.000000 0.000000 Dev_Irrigated-D-Med-Unconfined		0.000000	0.000000	000000
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6850 12111	Dev_Pervious-A-Low-Confined	0.000000	0.000000	0.00000	0.000000
0.000000 6850 12112	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	Dev_Pervious-A-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6850 12121	Dev_Pervious-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6850 12122	Dev_Pervious-A-Med-Unconfined		0.000000	0.000000	0.000000
0.000000 6850 12211	0.000000 0.000000 Dev_Pervious-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6850 12212	Dev_Pervious-B-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6850 12221 0.000000	Dev_Pervious-B-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 12222	Dev_Pervious-B-Med-Unconfined		0.000000	0.000000	0.000000
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6850 12311	Dev_Pervious-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6850 12312	0.000000 0.000000 Dev_Pervious-C-Low-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6850 12321	Dev_Pervious-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 12322 0.000000	Dev_Pervious-C-Med-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6850 12411	Dev_Pervious-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6850 12412	Dev_Pervious-D-Low-Unconfined		0.000000	0.00000	0.000000
0.000000 6850 12421	0.000000 0.000000 Dev_Pervious-D-Med-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0.00000
6850 12422	Dev_Pervious-D-Med-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 13111 0.000000	Agriculture-A-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6850 13112	Agriculture-A-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6850 13122	0.000000 0.000000 Agriculture-A-Med-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6850 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 13212 0.000000	Agriculture-B-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	1100000
6850 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000 6850 13231	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6850 13231 0.000000	Agriculture-B-High-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6850 13232	Agriculture-B-High-Unconfined		0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	

6850 13311					
	Agriculture-C-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13312		0.000000	0.000000	0.000000	0.00000
	Agriculture-C-Low-Unconfined				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0.00000
6850 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13331					0.00000
	Agriculture-C-High-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.00000	0.000000
	0.000000 0.000000				
0.000000		0.000000	0.000000	0.000000	
6850 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.00000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
					0 000000
6850 13421	Agriculture-D-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13422	Agriculture-D-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
	_				0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6850 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 14121	Veg_Low-A-Med-Confined 0.00000	0	.000000 0.0	0.000	1000
					7000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 14122	Veg_Low-A-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6850 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 14132	Veg_Low-A-High-Unconfined	0.000000	0.000000	0.000000	0.00000
	<u>-</u>				0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 14221	Veg_Low-B-Med-Confined 0.00000	0 0	.000000 0.0	0.000	000
	-				,000
0.000000		0.000000	0.000000	0.000000	
6850 14222	Veg_Low-B-Med-Unconfined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
					0 000000
6850 14231	Veg_Low-B-High-Confined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 14232	Veg_Low-B-High-Unconfined	0.000000	0.00000	0.00000	0.000000
	<u>-</u>				0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 14321	Veg_Low-C-Med-Confined 0.00000	0 0	.000000 0.0	0.000	0000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
					0 000000
6850 14322	Veg_Low-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
			0.00000	0.000000	0 000000
6850 14331	Veg_Low-C-High-Confined	0.000000	0.000000	0.000000	0.000000
	Veg_Low-C-High-Confined 0.000000 0.000000	0.000000	0.00000	0.000000	0.000000
6850 14331 0.000000	Veg_Low-C-High-Confined 0.000000 0.000000	0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	
6850 14331 0.000000 6850 14332	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.00000 0.00000 0.00000 0.00000 0.00000	0.000000
6850 14331 0.000000 6850 14332	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000 6850 14421	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined	0.000000 0.000000 0.000000 0.000000 0 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 Veg_Low-D-High-Confined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431 0.000000	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431 0.000000 6850 14432	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 Veg_Low-D-High-Confined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431 0.000000 6850 14432	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431 0.000000 6850 14432 0.000000	Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000 Veg_Low-D-High-Unconfined 0.000000 0.000000 Veg_Low-D-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
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15421 Veg_High-D-Med-Confined
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            Veg_High-D-Med-Unconfined
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6850 15422
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            Veg_High-D-High-Confined
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6850 15432
            Veg_High-D-High-Unconfined
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6850 16000
            Water-All-All 0.000000 0.000000 0.000000 0.000000
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6856 1000
            Road_Freeway-All-All-All
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6856 2000
            Road_Primary-All-All-All
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            Road_Minor-All-All-All0.000000 0.000000 0.000000 0.000000
6856 3000
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6856 4000
            Dev_ResHigh-All-All-All
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            Dev_ResLow-All-All-All0.000000 0.000000 0.000000 0.000000
6856 5000
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6856 6000
            Dev_Com-All-All 0.000000 0.000000 0.000000 0.000000
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6856 7000
            Dev_Ind-Al1-Al1 0.000000 0.000000 0.000000 0.000000
            0.000000
6856 8000
            Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
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6856 9000
            Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
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6856 10000
            Dev_Overspray-All-All-All
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6856 11111
            Dev Irrigated-A-Low-Confined 0.000000
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            Dev_Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
6856 11112
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6856 11121
            Dev_Irrigated-A-Med-Confined
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6856 11122
            Dev_Irrigated-A-Med-Unconfined 0.000000 0.000000 0.000000
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6856 11211
            Dev_Irrigated-B-Low-Confined 0.000000
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6856 11212
            Dev_Irrigated-B-Low-Unconfined 0.000000 0.000000 0.000000
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6856 11221
            Dev_Irrigated-B-Med-Confined
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6856 11222
            Dev Irrigated-B-Med-Unconfined 0.000000 0.000000 0.000000
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6856 11311
            Dev_Irrigated-C-Low-Confined 0.000000
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6856 11312
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6856 11321
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            Dev_Irrigated-C-Med-Confined
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6856 11322
            Dev_Irrigated-C-Med-Unconfined 0.000000 0.000000 0.000000
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6856 11411
            Dev_Irrigated-D-Low-Confined
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            Dev Irrigated-D-Low-Unconfined 0.000000 0.000000 0.000000
6856 11412
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6856 11421
            Dev Irrigated-D-Med-Confined
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6856 11422
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            Dev_Pervious-A-Low-Confined
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6856 12111
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6856 12112
            Dev_Pervious-A-Low-Unconfined 0.000000
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6856 12121
            Dev_Pervious-A-Med-Confined
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            Dev_Pervious-A-Med-Unconfined 0.000000
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6856 12122
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6856 12211
            Dev Pervious-B-Low-Confined
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6856 12212
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6856 12221
            Dev_Pervious-B-Med-Confined
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            Dev_Pervious-B-Med-Unconfined 0.000000
6856 12222
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6856 12311	Dev_Pervious-C-Low-Confined	0.000000	0.00000	0.00000	0.000000
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6856 12312	Dev_Pervious-C-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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6856 12321	Dev_Pervious-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6856 12322	Dev_Pervious-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6856 12411	Dev_Pervious-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6856 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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6856 12421	Dev_Pervious-D-Med-Confined	0.000000	0.00000	0.00000	0.00000
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6856 12422	Dev_Pervious-D-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6856 13111	Agriculture-A-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6856 13112	Agriculture-A-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6856 13121	Agriculture-A-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6856 13122					0.000000
	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6856 13211	Agriculture-B-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6856 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6856 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6856 13222	Agriculture-B-Med-Unconfined	0.000000	0.000000	0.000000	0.00000
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6856 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6856 13232	Agriculture-B-High-Unconfined		0.00000	0.000000	0.000000
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6856 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6856 13312	Agriculture-C-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
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6856 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.000000	0.000000
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6856 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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6856 13331	Agriculture-C-High-Confined	0.000000	0.00000	0.00000	0.000000
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6856 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.00000	0.000000
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6856 13412	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6856 13421	Agriculture-D-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6856 13422	Agriculture-D-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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0.00000	0.000000 0.000000	0.000000	0.000000	0.000000	
6856 13431	Agriculture-D-High-Confined	0.000000		0.00000	0.00000
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0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
		0.000000	0.000000	0.000000	
6856 13432	Agriculture-D-High-Unconfined	0.000000	0.00000 0.00000	0.000000	0.000000
6856 13432 0.000000	Agriculture-D-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.00000 0.00000 0.00000	0.000000
6856 13432 0.000000 6856 14121	Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000	0.000000 0.000000 0.000000 0 0	0.000000 0.000000 0.000000 .000000	0.000000 0.000000 0.000000	
6856 13432 0.000000	Agriculture-D-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.00000 0.00000 0.00000	0.000000
6856 13432 0.000000 6856 14121 0.000000	Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000	0.000000 0.000000 0.000000 0 0	0.000000 0.000000 0.000000 .000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
6856 13432 0.000000 6856 14121 0.000000 6856 14122	Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000 Veg_Low-A-Med-Unconfined	0.000000 0.000000 0.000000 0 0.000000 0.000000	0.000000 0.000000 0.000000 .000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6856 13432 0.000000 6856 14121 0.000000 6856 14122 0.000000	Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6856 13432 0.000000 6856 14121 0.000000 6856 14122 0.000000 6856 14131	Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined	$ \begin{array}{c} 0.000000 \\ 0.000000 \\ 0.000000 \\ 0 \\ 0.000000 \\ 0.000000 \\ 0.000000 \\ 0.000000 \\ 0.000000 \\ \end{array} $	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6856 13432 0.000000 6856 14121 0.000000 6856 14122 0.000000	Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6856 13432 0.000000 6856 14121 0.000000 6856 14122 0.000000 6856 14131 0.000000	Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000	$ \begin{array}{c} 0.000000 \\ 0.000000 \\ 0.000000 \\ 0 \\ 0.000000 \\ 0.000000 \\ 0.000000 \\ 0.000000 \\ 0.000000 \\ 0.000000 \\ \end{array} $	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0000 0.000000 0.000000
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6856 13432 0.000000 6856 14121 0.000000 6856 14122 0.000000 6856 14131 0.000000 6856 14132 0.000000 6856 14221	Agriculture-D-High-Unconfined 0.000000 0.0000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0000 0.000000 0.000000
6856 13432 0.000000 6856 14121 0.000000 6856 14122 0.000000 6856 14131 0.000000 6856 14132 0.000000 6856 14221 0.000000 6856 14221	Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.00000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.00000 Veg_Low-B-Med-Confined 0.00000 Veg_Low-B-Med-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0000 0.000000 0.000000
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6856 15221
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6856 15222
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6856 15231
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6856 15321
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6856 15322
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6856 15332
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6856 15421
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6856 15431
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6856 15432
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6856 16000
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6859 1000
            Road_Freeway-All-All-All
                                                   0.000000
                                                                            0.000000
            0.000000 0.000000
                                      0.000000
                                                  0.000000
                                                               0.000000
0.000000
6859
     2000
            Road_Primary-All-All-All
                                      0.000000
                                                  0.000000
                                                               0.000000
                                                                            0.000000
0.000000
            0.00000 0.000000
                                      0.000000
                                                  0.000000
                                                               0.000000
6859 3000
            Road_Minor-All-All-All 0.000000 0.000000 0.000000
                                                                   0.000000
0.000000
            0.000000 0.000000
                                     0.000000 0.000000
                                                               0.000000
6859 4000
            Dev_ResHigh-All-All-All
                                      0.000000
                                                  0.000000
                                                               0.000000
                                                                            0.000000
0.000000
            0.000000 0.000000
                                      0.000000
                                                  0.000000
                                                               0.000000
            Dev_ResLow-All-All-All0.000000 0.000000 0.000000
6859
     5000
                                                                     0.000000
            0.000000
                         0.000000 0.000000 0.000000
                                                               0.000000
0.000000
6859 6000
            Dev Com-All-All 0.000000 0.000000 0.000000 0.000000
            0.000000 0.000000 0.000000 0.000000
0.000000
6859 7000
            Dev Ind-All-All 0.000000 0.000000 0.000000 0.000000
            0.000000 0.000000 0.000000 0.000000
0.000000
            Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
6859 8000
            0.00000
6859 9000
            Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
0.00000
            0.000000 0.000000
                                     0.000000 0.000000 0.000000
6859 10000
                                                  0.000000
            Dev_Overspray-All-All-All
                                      0.000000
                                                               0.000000
                                                                            0.000000
0.000000
            0.000000
                        0.000000
                                      0.000000
                                                  0.000000
                                                               0.000000
6859 11111
            Dev_Irrigated-A-Low-Confined 0.000000
                                                  0.000000
                                                               0.000000
                                                                            0.000000
0.000000
            0.000000
                        0.000000
                                      0.000000
                                                  0.000000
                                                               0.000000
            Dev_Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
6859 11112
                                                                            0.000000
0.000000
            0.00000
                        0.000000
                                     0.000000 0.000000 0.000000
            Dev_Irrigated-A-Med-Confined 0.000000
                                                               0.000000
6859 11121
                                                  0.000000
                                                                            0.000000
                                                  0.000000
0.000000
            0.000000
                        0.000000
                                      0.000000
                                                               0.000000
            Dev_Irrigated-A-Med-Unconfined 0.000000 0.000000
6859 11122
                                                                   0.000000
                                     0.000000 0.000000
0.00000
            0.000000 0.000000
                                                               0.000000
                                                                            0.000000
            Dev_Irrigated-B-Low-Confined 0.000000
6859 11211
                                                  0.000000
                                                               0.000000
                                                                            0.000000
0.000000
            0.000000 0.000000 0.000000
                                                 0.000000 0.000000
            Dev_Irrigated-B-Low-Unconfined 0.000000 0.000000 0.000000
6859 11212
            0.000000
                     0.000000
```

6859 11221	Dev Irrigated-B-Med-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 11222	Dev_Irrigated-B-Med-Unconfined				00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6859 11311	Dev_Irrigated-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6859 11312	Dev_Irrigated-C-Low-Unconfined	0 E	.000000 0	.000000 0.0	00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	0.00000
6859 11321	Dev_Irrigated-C-Med-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 11322	Dev_Irrigated-C-Med-Unconfined	0 E	.000000 0	.000000 0.0	00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6859 11411	Dev_Irrigated-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6859 11412	Dev_Irrigated-D-Low-Unconfined	0 E	.000000 0	.000000 0.0	00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6859 11421	Dev_Irrigated-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6859 11422	Dev_Irrigated-D-Med-Unconfined				00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6859 12111	Dev_Pervious-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6859 12112	Dev_Pervious-A-Low-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6859 12121	Dev_Pervious-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6859 12122	Dev_Pervious-A-Med-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6859 12211	Dev_Pervious-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 12212	Dev_Pervious-B-Low-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 12221	Dev_Pervious-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6859 12222	Dev_Pervious-B-Med-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6859 12311	Dev_Pervious-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 00000
6859 12312	Dev_Pervious-C-Low-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 00000
6859 12321	Dev_Pervious-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6859 12322	0.000000 0.000000 Down Downious C Mod Ungenfined	0.000000	0.000000	0.000000	0 00000
0.000000	Dev_Pervious-C-Med-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
	Dev Pervious-D-Low-Confined		0.000000	0.000000	0.00000
6859 12411 0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0.00000
6859 12421	Dev_Pervious-D-Med-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 12422	Dev Pervious-D-Med-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 13111	Agriculture-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 13112	Agriculture-A-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 13122	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 13221	Agriculture-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 13222	Agriculture-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	3.00000
6859 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	3.00000
6859 13232	Agriculture-B-High-Unconfined		0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	1.00000
6859 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	3.00000
6859 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6859 13321	Agriculture-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	

6859 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6859 13331	Agriculture-C-High-Confined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6859 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.00000	0.00000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6859 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 13421	Agriculture-D-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000			
			0.00000	0.000000	
6859 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 00000
6859 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6859 14121	Veg_Low-A-Med-Confined 0.00000		.000000 0.00		0000
	-				0000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6859 14122	Veg_Low-A-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6859 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.00000	0.000000
	-				
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 14132	Veg_Low-A-High-Unconfined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6859 14221	Veg_Low-B-Med-Confined 0.00000	0 0	.000000 0.00	0.00	0000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 14222	<pre>Veg_Low-B-Med-Unconfined</pre>	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
					0 000000
6859 14231	Veg_Low-B-High-Confined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6859 14232	Veg_Low-B-High-Unconfined	0.000000	0.00000	0.00000	0.000000
					0.00000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6859 14321	Veg_Low-C-Med-Confined 0.00000	0	.000000 0.00	0.00	0000
	-				0000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 14322	Veg_Low-C-Med-Unconfined	0.000000	0.000000	0.00000	0.00000
	-				
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 14331	Veg_Low-C-High-Confined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 14332	Veg_Low-C-High-Unconfined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0 00000	0.00000	
			0.00000	0.00000	
					0000
6859 14421	Veg_Low-D-Med-Confined 0.00000	0 0	.000000 0.00	0.00	0000
					0000
6859 14421 0.000000	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000	0.000000	0.00	0.00	
6859 14421 0.000000 6859 14422	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined	0.000000 0.000000	.000000 0.00 0.000000 0.000000	0.00 0.000000 0.000000	0.00000
6859 14421 0.000000	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000	0.000000	0.00	0.00	
6859 14421 0.000000 6859 14422 0.000000	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000	0.00 0.000000 0.000000 0.000000	0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 Veg_Low-D-High-Confined	0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.00 0.000000 0.000000 0.000000 0.000000	
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000	0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.00 0.000000 0.000000 0.000000	0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 Veg_Low-D-High-Confined	0 0 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000	0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000 6859 14432	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000 Veg_Low-D-High-Unconfined	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000 6859 14432 0.000000	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000 Veg_Low-D-High-Unconfined 0.000000 0.000000 0.000000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000 6859 14432	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000 Veg_Low-D-High-Unconfined	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000 6859 14432 0.000000 6859 15121	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 0.000000 0.000000 0.000000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000 6859 14432 0.000000 6859 15121 0.000000	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Unconfined 0.000000 0.0000000 Veg_High-A-Med-Confined 0.000000 0.000000 0.000000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000 6859 14432 0.000000 6859 15121	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 0.000000 0.000000 0.000000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000 6859 14432 0.000000 6859 15121 0.000000 6859 15122	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Unconfined 0.000000 0.000000 Veg_High-A-Med-Confined 0.000000 Veg_High-A-Med-Unconfined 0.000000 Veg_High-A-Med-Unconfined	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000 6859 14432 0.000000 6859 15121 0.000000 6859 15122 0.000000	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Unconfined 0.000000 Veg_Low-D-High-Unconfined 0.000000 Veg_High-A-Med-Confined 0.000000 Veg_High-A-Med-Unconfined 0.000000 Veg_High-A-Med-Unconfined 0.000000 Veg_High-A-Med-Unconfined 0.000000 0.0000000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000 6859 14432 0.000000 6859 15121 0.000000 6859 15122 0.000000 6859 15131	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Unconfined 0.000000 Veg_High-A-Med-Confined 0.000000 Veg_High-A-Med-Unconfined 0.000000 Veg_High-A-Med-Unconfined 0.000000 Veg_High-A-Med-Unconfined 0.000000 Veg_High-A-Med-Unconfined 0.000000 0.000000 Veg_High-A-High-Confined	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000 6859 14432 0.000000 6859 15121 0.000000 6859 15122 0.000000 6859 15131	Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Unconfined 0.000000 Veg_Low-D-High-Unconfined 0.000000 Veg_High-A-Med-Confined 0.000000 Veg_High-A-Med-Unconfined 0.000000 Veg_High-A-Med-Unconfined 0.000000 Veg_High-A-Med-Unconfined 0.000000 0.0000000	0 0 0.000000 0.000000 0.000000 0.000000 0.000000	.000000 0.00 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
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        Veg_High-D-High-Unconfined
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6859
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6859 16000
            Water-All-All 0.000000 0.000000 0.000000 0.000000
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             Road_Freeway-All-All-All
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6861 2000
            Road_Primary-All-All-All
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            Road Minor-All-All-All 0.000000 0.000000 0.000000
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6861
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6861 4000
            Dev_ResHigh-All-All-All
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6861 5000
            Dev ResLow-All-All-All0.000000 0.000000 0.000000 0.000000
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            0.000000 0.000000 0.000000 0.000000
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            Dev_Com-All-All 0.000000 0.000000 0.000000 0.000000
6861 6000
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6861 7000
            Dev_Ind-All-All 0.000000 0.000000 0.000000 0.000000
            0.00000 0.00000 0.00000 0.00000 0.00000
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            Dev_Inst-All-All 0.000000 0.000000 0.000000
6861 8000
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            Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
6861 9000
            0.000000 0.000000 0.000000 0.000000
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6861 10000
            Dev_Overspray-All-All-All
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            Dev_Irrigated-A-Low-Confined 0.000000
6861 11111
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6861 11112
            Dev_Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
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6861 11121
            Dev_Irrigated-A-Med-Confined 0.000000
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6861 11122
            Dev Irrigated-A-Med-Unconfined 0.000000 0.000000 0.000000
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            Dev_Irrigated-B-Low-Confined 0.000000
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6861 11211
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6861 11212
            Dev_Irrigated-B-Low-Unconfined 0.000000 0.000000 0.000000
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6861 11221
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            Dev_Irrigated-B-Med-Confined
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            Dev_Irrigated-B-Med-Unconfined 0.000000 0.000000 0.000000
6861 11222
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6861 11311
            Dev_Irrigated-C-Low-Confined 0.000000
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            Dev Irrigated-C-Low-Unconfined 0.000000 0.000000 0.000000
6861 11312
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6861 11321
            Dev Irrigated-C-Med-Confined
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6861 11322
            Dev_Irrigated-C-Med-Unconfined 0.000000 0.000000 0.000000
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6861 11411
            Dev_Irrigated-D-Low-Confined
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6861 11412
            Dev_Irrigated-D-Low-Unconfined 0.000000 0.000000 0.000000
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6861 11421
            Dev_Irrigated-D-Med-Confined
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6861 11422
            Dev_Irrigated-D-Med-Unconfined 0.000000 0.000000 0.000000
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6861 12111
            Dev Pervious-A-Low-Confined
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6861 12112
            Dev Pervious-A-Low-Unconfined 0.000000
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6861 12121
            Dev_Pervious-A-Med-Confined
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            Dev_Pervious-A-Med-Unconfined 0.000000
6861 12122
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6861 12211
            Dev_Pervious-B-Low-Confined
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6861 12212
            Dev_Pervious-B-Low-Unconfined 0.000000
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6861 12221
            Dev_Pervious-B-Med-Confined
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6861 12222
            Dev Pervious-B-Med-Unconfined 0.000000
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6861 12311
            Dev Pervious-C-Low-Confined
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6861 12312
            Dev_Pervious-C-Low-Unconfined 0.000000
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            Dev_Pervious-C-Med-Confined
6861 12321
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6861 12322					
	Dev_Pervious-C-Med-Unconfined		0.000000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 12411	Dev_Pervious-D-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6861 12412	Dev_Pervious-D-Low-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
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6861 12421	Dev_Pervious-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 12422	Dev_Pervious-D-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13111	Agriculture-A-Low-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
					0 000000
6861 13112	Agriculture-A-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6861 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13122	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6861 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.000000	0.00000
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0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6861 13221	Agriculture-B-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6861 13222	Agriculture-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000		0.00000
				0.000000	
6861 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13232	Agriculture-B-High-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
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6861 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6861 13321	Agriculture-C-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13322	Agriculture-C-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13331	Agriculture-C-High-Confined	0.000000	0.000000	0.000000	0.000000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6861 13411	Agriculture-D-Low-Confined	0.000000	0.000000	0.000000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13412	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
			0.000000		0 000000
6861 13421	Agriculture-D-Med-Contined	0.00000			
6861 13421	Agriculture-D-Med-Confined	0.000000		0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
0.000000 6861 13422	0.000000 0.000000 Agriculture-D-Med-Unconfined	0.000000 0.000000	0.000000	0.000000 0.000000 0.000000	0.000000
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0.000000 6861 13422 0.000000	0.000000 0.000000 Agriculture-D-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
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Curtis Fang

From: Ernesto Rivera <ERIVERA@dpw.lacounty.gov>

Sent: Wednesday, October 14, 2020 3:28 PM

To: Levitt, Melissa; Genevieve Osmena; Nayiri Vartanian

Cc: Repenning, Heather; Reiter, Craig

Subject: RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Melissa,

I apologize for the delay in getting back to you on this. We received unexpected number of requests for concept approvals. We have reviewed your project, recommended approval, and have drafted a concept approval letter. We have been informed by the Safe Clean Water Team that the applications submitted by the deadline will be considered complete (even if the approval letter is pending). You can include this email in your application. Otherwise, we'll provide you a signed concept approval letter once it becomes available. Thank you.

Ernesto J Rivera, P.E.
Civil Engineer

Los Angeles County Public Works

Office: (626) 458-6110

From: Levitt, Melissa <LevittM@metro.net>
Sent: Wednesday, October 14, 2020 10:34 AM

To: Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Genevieve Osmena <gosmena@dpw.lacounty.gov>; Nayiri Vartanian

<NVARTANIAN@dpw.lacounty.gov>

Cc: Repenning, Heather < RepenningH@metro.net>; Reiter, Craig < ReiterC@metro.net>

Subject: RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

CAUTION: External Email. Proceed Responsibly.

Hello Nayiri and Ernesto,

Thank you for taking the time to speak with me yesterday and confirming the LACFCD is providing conceptual approval for our Measure W application. My understanding is that is that a letter will be sent via mail confirming this. Since the Measure W application is due Thursday and I am currently telecommuting, would it be possible to receive an electronic copy of the letter or a confirmation via email?

Thank you in advance for your assistance, Melissa

Melissa Faigeles Levitt, MPA, ENV SP

LA Metro
Senior Environmental Specialist
Environmental Compliance & Sustainability
213.418.3478 W
213.265.0774 C

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^{*}I am currently telecommuting. I am available via email and cell phone during this period

From: Ernesto Rivera <ERIVERA@dpw.lacounty.gov>

Sent: Thursday, October 8, 2020 9:29 AM

To: Levitt, Melissa <LevittM@metro.net>; Genevieve Osmena <gosmena@dpw.lacounty.gov>; Nayiri Vartanian

<NVARTANIAN@dpw.lacounty.gov>

Cc: Repenning, Heather < RepenningH@metro.net>; Reiter, Craig < ReiterC@metro.net>

Subject: RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Melissa,

Thank you for following up. Our concept approval / recommendation will go up to our administration today. I anticipate being able to provide you a final response by next Tuesday or Wednesday. I'll keep you updated if any changes. Thanks again.

Ernesto J Rivera, P.E. Civil Engineer

Los Angeles County Public Works

Office: (626) 458-6110

From: Levitt, Melissa < LevittM@metro.net > Sent: Thursday, October 8, 2020 9:24 AM

To: Genevieve Osmena <gosmena@dpw.lacounty.gov>; Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Nayiri Vartanian

<<u>NVARTANIAN@dpw.lacounty.gov</u>>

Cc: Repenning, Heather < <u>RepenningH@metro.net</u>>; Reiter, Craig < <u>ReiterC@metro.net</u>>

Subject: RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

CAUTION: External Email. Proceed Responsibly.

Good morning Ernesto and Nayiri,

I wanted to follow up to see if you have any questions regarding the materials provided for the Metro Orange Line Water Infiltration and Quality Project? I am happy to discuss the project with you, at your convenience. Can you please advise on when I may anticipate a decision on the conceptual approval of the project?

Thank you in advance for your assistance, Melissa

Melissa Faigeles Levitt, MPA, ENV SP

LA Metro

Senior Environmental Specialist

Environmental Compliance & Sustainability

213.418.3478 W

213.265.0774 C

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From: Levitt, Melissa

Sent: Monday, October 5, 2020 10:07 AM

To: 'Genevieve Osmena' <gosmena@dpw.lacounty.gov>; Ernesto Rivera <ERIVERA@dpw.lacounty.gov>; Nayiri

Vartanian < NVARTANIAN@dpw.lacounty.gov>

Cc: Repenning, Heather < RepenningH@metro.net >; Reiter, Craig < ReiterC@metro.net >

Subject: RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Ernesto and Nayiri,

Please see attached our draft BMP site layout plan. Let me know if you have any questions or would like to set up a time to discuss the project. Metro is seeking to obtain conceptual approval from LACFCD in advance of submitting our Measure W application for the project. Please let me know if there is additional information you would like me to provide.

Regards, Melissa

Melissa Faigeles Levitt, MPA, ENV SP

LA Metro Senior Environmental Specialist Environmental Compliance & Sustainability 213.418.3478 W 213.265.0774 C

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From: Levitt, Melissa

Sent: Thursday, October 1, 2020 10:05 AM

To: Genevieve Osmena <gosmena@dpw.lacounty.gov>

Cc: Repenning, Heather <RepenningH@metro.net>; Reiter, Craig <ReiterC@metro.net>; Ernesto Rivera

<ERIVERA@dpw.lacounty.gov>; Nayiri Vartanian <NVARTANIAN@dpw.lacounty.gov>

Subject: RE: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Thank you, Genevieve.

Ernesto and Nayiri – Please see attached our draft Hydrology and Water Quality Analysis. I should have a BMP site layout plan to share with you by tomorrow. I am available to answer any questions that you might have.

Thank you, Melissa

Melissa Faigeles Levitt, MPA, ENV SP

LA Metro Senior Environmental Specialist Environmental Compliance & Sustainability 213.418.3478 W 213.265.0774 C

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From: Genevieve Osmena <gosmena@dpw.lacounty.gov>

Sent: Wednesday, September 30, 2020 11:04 AM

To: Levitt, Melissa < LevittM@metro.net >

Cc: Repenning, Heather <RepenningH@metro.net>; Reiter, Craig <ReiterC@metro.net>; Ernesto Rivera

<<u>ERIVERA@dpw.lacounty.gov</u>>; Nayiri Vartanian <<u>NVARTANIAN@dpw.lacounty.gov</u>>

Subject: Re: Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

Hi Melissa,

Please go ahead and work directly with Ernesto Rivera and Nayiri Vartanian of my team, who I have cc'd above. They will be reviewing the project info and will coordinate with you on the requested concept approval letter. Thank you also for sending the project fact sheet. If you happen to have any other items like a feasibility or concept report that you're able to share, feel free to send that to our team as well.

Thank you,

Genevieve Osmena, P.E. Senior Civil Engineer Los Angeles County Public Works

Office: (626) 458-4322

From: Levitt, Melissa < LevittM@metro.net > Sent: Tuesday, September 29, 2020 11:41 AM

To: Genevieve Osmena <gosmena@dpw.lacounty.gov>

Cc: Repenning, Heather < <u>RepenningH@metro.net</u>>; Reiter, Craig < <u>ReiterC@metro.net</u>> **Subject:** Measure W LACFCD Conceptual Approval - MOL Water Infiltration & Quality Project

CAUTION: External Email. Proceed Responsibly.

Genevieve,

Metro, in partnership with LADWP is preparing to submit a Measure W application for FY 20-21 in the Upper Los Angeles River Watershed. The Metro Orange Line Water Infiltration and Quality Project proposes to implement 168 drywells with pretreatment facilities to capture, treat, and infiltrate stormwater runoff from 2,320 acres drainage area, resulting in an estimated annual groundwater recharge yield between 780 and 1,050 acre-feet/year into the San Fernando Groundwater Basin.

As the proposed Project involves LACFCD's storm drain facilities, Metro is seeking to obtain conceptual approval from LACFCD. I have attached a Project fact sheet, which provides more details on the proposed Project and LACFCD facilities. I am happy to set up a time to discuss the Project and answer any questions you might have, at your earliest convenience.

Regards, Melissa

Melissa Faigeles Levitt, MPA, ENV SP

LA Metro Senior Environmental Specialist Environmental Compliance & Sustainability 213.418.3478 W 213.265.0774 C

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*I am currently telecommuting. I am available via email and cell phone during this period



COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE ALHAMBRA, CALIFORNIA 91803-1331 Telephone: (626) 458-5100 http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO: P.O. BOX 1460 ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE REFER TO FILE:

SWP-5

October 19, 2020

Ms. Melissa Levitt Los Angeles County Metropolitan Transportation Authority One Gateway Plaza Mail Stop 99-16-9 Los Angeles, CA 90012-2952

NOTICE OF CONCEPTUAL APPROVAL FOR SAFE, CLEAN WATER PROGRAM CONSIDERATION OF INFRASTRUCTURE PROJECTS FUNDING

Los Angeles County Flood Control District has been engaged to review the following project and is hereby providing conceptual approval:

Metro Orange Line Water Infiltration and Quality Project LA Metro-Environmental Compliance and Sustainability Upper Los Angeles Watershed Area

We understand the proposed multi-benefit project will increase groundwater recharge, by implementing 168 drywells with pretreatment facilities, which will capture, treat and infiltrate dry weather and stormwater runoff. This will help reduce the pollutant load on the Los Angeles River. In addition, this Project will allow Metro to contribute to regional groundwater infiltration and help towards achieving goals to become net water positive.

The Project is not currently inconsistent with any District plans, policies, or goals. Conceptual approval for this Project does not indicate the District's consent to support or even permit the Project. If funding is ultimately allocated to the Project, it is required that the developer remain closely engaged with the District throughout each subsequent project phase and comply with any eventual applicable agreement and/or permit provisions. Please upload a copy of this letter in the Projects Module application when responding to the Regional Program Call for Projects.

Ms. Melissa Levitt October 19, 2020 Page 2

Please be sure to continue to work with your District's Watershed Manager from Los Angeles County Public Works, Genevieve Osmena. Ms. Osmena can be reached at (626) 458-4322 or gosmena@pw.lacountv.gov. Ongoing collaboration is imperative. If the subject project is not funded within 2 years from the date of this letter, a new demonstration of conceptual approval will be required before the project can again be considered.

Thank you for your interest in the Safe, Clean Water Program.

MARK PESTRELLA Chief Engineer Los Angeles County Flood Control District

KEITH A. LYLLEY

Assistant Deputy Director Stormwater Planning Division

GO:bm

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engineers | scientists | innovators

Utility Review

Metro Orange Line Water Infiltration and Quality Project

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement infiltration best management practices (BMPs) within LA Metro parcels and right-of-way (ROW) in the East San Fernando Valley. The Project will correspond with the Metro Orange Line Bus Rail Transit (MOL BRT) Improvements Project, one of Metro's self-funded capital improvement projects. The purpose of the Project is to capture and infiltrate stormwater runoff, to improve downstream water quality, help recharge the groundwater basin, and mitigate localized nuisance flooding in disadvantaged communities and neighborhoods with significant unmet needs within the neighboring geographical area. This will be accomplished through the installation of 168 drywells, as well as underground pretreatment facilities, separated into seven geographic clusters.

The conceptual design presented in "Project Configuration" section of this application is prepared in reference to the record as-built, which includes information on existing:

- Storm drains;
- Sewers:
- Gas lines:
- Power supply lines;
- Pacific Telephone/Telegraph & Western Union phone lines;
- Electrolier lighting conduits;
- Traffic signal conduits;
- Police and fire alarm conduits;
- Oil and gasoline pipelines; and
- Vaults, footing, and miscellaneous structures.

Project design elements were prepared to ensure compatibility, as best as is possible from the desktop, with existing utilities. Existing utilities are part of the reference layers behind the conceptual design uploaded "Project Configuration" section of this application. Conflicts with existing wet utilities are limited to storm drains that will be incorporated into the project and sewer lines that will be designed around. As shown in the drawing, minor alterations to the existing storm drains within Metro right-of-way will be required to divert on-site stormwater runoff into the proposed infiltration BMPs at Sites MOL-1, MOL-4 and MOL-7. In addition, the diversion structures at MOL-3, MOL-6 and MOL-7 will cross existing sewer lines. For MOL-3 and MOL-7, since stormwater will be diverted via active pumping at both sites, the diversion pipes will be placed at deeper depth than the sewer lines to avoid interference. For MOL-6, a shallow lateral pipe will be constructed to connect catch basins on the west side of Woodman Ave. to the BMP to avoid interference.

Additional surveying and potholing will be conducted as project design proceeds to confirm the exact location of utilities, and the Project design will be refined accordingly.



ATTACHMENTS FOR SECTION 2.5:

MONITORING





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Monitoring Plan

Metro Orange Line Water Infiltration and Quality Project

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1. INTRODUCTION

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement distributed low impact development (LID) infiltration best management practices (BMPs) within LA Metro parcels and right-of-way (ROW) in the East San Fernando Valley. The Project will correspond with the Metro Orange Line Bus Rail Transit (MOL BRT) Improvement Project, one of Metro's self-funded capital improvement projects. The purpose of the Project is to capture and infiltrate stormwater runoff, to improve downstream water quality, help recharge the groundwater basin, and mitigate localized nuisance flooding in disadvantaged communities and neighborhoods with significant unmet needs within the neighboring geographical area. This will be accomplished through the installation of 168 drywells, as well as underground pretreatment facilities, separated into seven geographic clusters.

1.1 Monitoring Objectives

The objectives of this monitoring plan are to:

- 1. Measure the effectiveness of the proposed Project once completed, and
- 2. Guide staff in performing observations, measurements, and sample collection in the field.

The primary effectiveness metrics for the proposed Project are defined generally in terms of achieved water supply and water quality benefits. Water supply benefits will be monitored by measuring inflow into proposed facilities, and water quality benefits will be monitored by collecting water samples of stormwater runoff upstream of proposed Project facilities. It is assumed that all runoff that enters a project facility will be infiltrated, and all pollutants that enter the facility can therefore be considered reduced, as they will have been diverted from the downstream receiving water.

Especially relevant pollutants of concern for the proposed Project include zinc, the primary pollutant as identified in the Project feasibility study, and bacteria (specifically *E. coli*), the secondary pollutant as identified in the Project feasibility study. These pollutants are identified in the Upper LA River EWMP as "limiting pollutants", the pollutants that drive BMP capacity (i.e., control measures that address limiting pollutants will also address other pollutants). The full list of constituents to be analyzed is discussed in Table 1.

Visual observations provide qualitative data on facility parameters that might impact BMP performance or explain analytical results. Visual observations of the conditions and performance of the proposed facilities will include:

- Trash, sediment, and debris buildup in the pretreatment systems (i.e., subsurface pretreatment galleries and drywell primary settling chambers);
- Description of any odors, floating material, suspended material, sheen, and discoloration;
 and

Monitoring Plan 1 October 10, 2020

• Qualitative observations of flow patterns (i.e., presence and estimate of bypass flows).

1.2 Monitoring Plan Development

This Monitoring Plan has been developed as part of the Project feasibility study. Project facility locations and other Project specifics are subject to change prior to or during the Project construction process. Therefore, some details in this Monitoring Plan will be determined at a later stage of project development, such as:

- Sampling frequency;
- The precise locations of monitoring sites, inlet/outlet locations, and BMP ID numbers for use in the field forms;
- The number of facilities to be monitored;
- The laboratories used for sample analyses;
- Specific staff involved in monitoring or sample collection; and
- Site-specific elements of field documents such as health and safety plans and field observation logs.

2. MONITORING STRATEGY

2.1 Monitoring Strategy

The effectiveness of the proposed Project facilities (drywell clusters with underground pretreatment galleries) will be assessed during both dry and wet weather.

The primary effectiveness metrics for water supply and water quality benefits can best be assessed during wet weather events by measuring flowrates and analyzing collected water samples. Visual observations during wet weather events can also provide valuable insight into flow patterns and approximate capture/bypass ratios, which can aid in identifying potential issues such as clogging or ponding. "First-flush" rain events at the beginning of the rainy season are a priority for monitoring, as a particularly large amount of pollutants, sediment, and trash can be expected to be present in runoff during these events.

Dry weather monitoring also provides key insight into Project performance. During dry weather, drywell primary settling chambers and pretreatment galleries will be more readily accessible and observable. Dry weather observations can yield information about sediment and/or trash buildup within the drywell primary settling chambers, providing information on future maintenance requirements or the necessity of additional pretreatment or trash screens. Dry-weather runoff flows are anticipated to be minimal in the Project area, and all Project facilities are expected to capture and treat 100% of dry-weather flows.

Water quality grab samples will be collected between the diversion structure feeding the drywell cluster, prior to any pretreatment (either underground pretreatment galleries or drywell primary settling chambers). As each cluster of drywells receives flow from the same diversion structure, sampling from this location is expected to be characteristic of all influent for all associated drywells. Preliminarily, it is expected that for one of the drywell clusters there will be flow monitor installation, water quality sample collection, and visual observations, and the remaining four clusters will only be monitored through visual observations. Within each cluster, one drywell and the associated underground pretreatment gallery will be visually inspected.

2.2 Runoff Volume and Pollutant Load Estimation

Wet and dry weather runoff inflow to the drywells is a critical parameter to monitor. Runoff volume and flowrate will be measured by installing flow meters between the drywells (and their associated pretreatment galleries) and diversion structure at selected clusters. Flow meters will provide continuous measurement of flow depth, and when combined with known pipe geometry, will generate continuous flow data. If desired and if budget allows, redundant flow monitors of different types can be installed as a backup to ensure data collection, which is especially important due to the infrequency of rain events in the Los Angeles area.

As a supplement and comparison to data collected by flow monitors, flow volumes and rates for each facility will be estimated based on rainfall data, infiltration rates, and the characteristics of each facility's tributary drainage area. These estimates may be calibrated with the data collected by flow monitors, to better extrapolate field data to unmonitored clusters. Pollutant load data from the monitored sites will be extrapolated to unmonitored sites using these calibrated flow estimates.

2.3 Monitoring Locations

Monitoring locations will be selected after facility locations are finalized.

3. SAMPLING PROCEDURES AND ANALYTICAL METHODS

3.1 Wet-Weather Mobilization

Weather forecasts will be tracked using the National Weather Service (NWS) Los Angeles/Oxnard Weather Forecast Office website¹, set to the approximate centroid of the project facilities. Wet-weather mobilization will be based on the criteria set forth in Attachment E, Part VIII.B.1.b.iii of the 2012 Los Angeles Region MS4 Permit, targeting storms with predicted rainfall of 0.25 inches and at least 70% probability of rainfall. Best professional judgement by the sampling coordinator shall be used to determine mobilization activities for marginally qualifying storm events, taking into consideration budget constraints associated with potential false starts.

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¹ https://www.wrh.noaa.gov/forecast/wxtables/index.php?lat=34.18482583857345&lon=-118.38892936706544

3.2 Dry-Weather Mobilization

Dry-weather visual observations will be conducted once each monitoring year between May 31st and October 1st, where monthly rainfall totals in the Project region are typically below 0.1 inches. This monitoring period will allow for assessment of sediment and debris buildup in pretreatment systems after the entirety of the rainy season.

3.3 Laboratory

A laboratory with Environmental Laboratory Accreditation Program (ELAP) certification will be selected for wet weather sample analysis. The laboratory will be located in the Los Angeles region to better facilitate sample delivery and compliance with required hold times.

Potential constituents to be analyzed, their hold times, and their analysis methods are shown below in Table 1.

Table 1 - Analyzed Constituents, Methods, and Holding Times

Constituent	Analysis Method	Holding Time
Physical Characteristics		
рН	YSI ProDSS or similar	N/A; measured in the field
Temperature	YSI ProDSS or similar	N/A; measured in the field
Dissolved Oxygen	YSI ProDSS or similar	N/A; measured in the field
Specific Conductivity	YSI ProDSS or similar	N/A; measured in the field
Turbidity	YSI ProDSS or similar	N/A; measured in the field
Hardness	SM2340B	180 days
Oil and Grease	SM5510 B	28 days
Total Suspended Solids	SM 2540 D	7 days
Biological Oxygen Demand	SM5210 B	48 hours
Nutrients		
Ammonia	SM4500-NH3 B/C	28 days
Nitrite	EPA Method 300.0	7 days
Nitrate	EPA Method 300.0	7 days
Total Kjeldahl Nitrogen	SM4500-Norg B	28 days
Total Phosphorus	SM4500-P E	28 days
Bacteria		
Total Coliform	SM9221B	6 hours
Fecal Coliform	SM9221E	6 hours
E. Coli	SM9221B/E	6 hours
Enterococcus	SM9230B	6 hours
Metals		
Zinc	EPA Method 200.8	180 days
Copper	EPA Method 200.8	180 days
Lead	EPA Method 200.8	180 days

3.4 Field Analytical Methods

Field water quality analyses will be performed at every sampling location where water quality samples are collected for laboratory analysis. A YSI ProDSS, or similar, multi-parameter meter will be used, which is capable of instantly measuring a wide variety of analytes in the field. All meters will be appropriately calibrated prior to each wet weather monitoring event.

3.4.1 Sample Container, Collection, Transport, and Holding Procedures

The appropriate size, material, color, preservative, temperature, and hold time requirement for each analyte will be determined in accordance with procedures from the ELAP-certified laboratory. Prior to each wet-weather monitoring event, sample containers will be staged and labeled.

The preferred sample collection method will be to immerse the container directly into the flow or below the static water surface level, using "clean hands/dirty hands" (EPA 1669) collection techniques. Shallow flows may be collected using a sanitized transfer container.

After samples are collected, they will be placed into coolers with ice or cold-packs, kept to a temperature of 4°C or less. Samples will be delivered under chain of custody to the contract laboratory for analysis within six hours (the limiting hold time in Table 1). During sample delivery, laboratory staff will accept the samples and sign the Chain of Custody (COC) form, assuming responsibility for sample storage and completion of analyses within the hold times. Samples should only be disposed by the laboratory after quality assurance/control procedures are reviewed and accepted.

3.4.2 Field Logs and Forms

COC forms (as shown in Appendix A) will be obtained from the ELAP-certified laboratory and pre-filled to the extent possible before wet-weather mobilization. The COC forms will identify the sample locations, analyses to be performed, date and time of sample collection, and the sampler's initials.

Each monitoring location will have a customized field observation log form for both dry- and wet-weather monitoring. An example form is provided in Appendix B and will be updated with site-specific details prior to selection of monitoring locations. All completed field observation logs will be digitized after returning from the field.

3.5 Quality Assurance and Quality Control

During each wet-weather mobilization, at least one field duplicate and one field blank will be collected. All sampling procedures will adhere to the guidelines set forth in the Surface Water Ambient Monitoring Program (SWAMP) operating procedure "Field Collection of Water Samples."

4. DATA MANAGEMENT AND REPORTING

All field monitoring/sampling procedures will adhere to the guidelines found in the State of California's SWAMP procedures, including the Quality Assurance Program Plan (QAPP) included therein. The laboratory will utilize its own QAPP which will supplement this Monitoring Plan. The purpose of the QAPP is to ensure that the monitoring program produces consistent, reliable data that meet the project's overall goals, and that data quality objectives are met. Data Quality Objectives will be discussed in detail in the QAPP. In general, the QAPP will ensure that laboratory analyses are consistent with guidelines established by the State of California's SWAMP. The QAPP will also specify the corrective actions to be taken when Data Quality Objectives are not being met.

Field observations and data collected during each monitoring event will be recorded and maintained. These observations include information relevant to a particular sampling event, such as date, time, field personnel, sampling location(s), sample ID, flow estimates, observations, and visual site characteristics as may be relevant to the location and project characteristics. This information will be summarized in each site-specific field form.

APPENDIX AExample Chain of Custody Form

ENTHALPY ANALYTICAL, INC.

806 N. Batavia St., Orange, CA 92868

Phone: (714) 771-6900 Fax: (714)771-9933

Billing: Enthalpy - SoCal

c/o Montrose Environmental Group

1 Park Plaza, Suite 1000, Irvine, CA 92614



Cha	in of Custo	dy Rec	ord	Turn Around Time (Rush by advanced notice only)							
Lab No:				Standard:		4 Day:		3 Day:			
Page:		of		2 Day:		1 Day:		Same Day:			

Matrix: A = Air DW = Drinking Water

FL = Food Liquid FS = Food Solid L = Liquid

PP = Pure Product S = Solid SeaW = Sea Water

SW = Swab W = Water WP = Wipe Q = Other

Preservatives: $1 = Na_2S_2O_3$ 2 = HCl $3 = HNO_3$ $4 = H_2SO_4$ 5 = NaOH 6 = Other

i i aik i iaza, Jai		,				0	- 3 Wab W - W	atc. 111		.60						
CUSTOMER INFORMATION				PROJECT INFORMATION					Analysis Request							Test Instructions / Comments
Company:				Name:												
Report To:				Number:												
Email:				P.O. #:												
Address:				Address:												
Phone:				Global ID:												
Fax:				Sampled By:												
	Sample ID Samplin		Sampling Date	g Sam Tir		Matrix	Container No. / Size	Pres.								
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
		S	ignature			Pr	int Name				Co	mpai	ny /	Title		Date / Time
¹ Relinquished																
¹ Received By	' :															
² Relinquished	d By:															
² Received By	' :															
³ Relinquished	d By:															
³ Received By	:															

APPENDIX BExample Field Observation Form

FIELD COLLECTION SHEET Metro Orange Line Water Infiltraion and Quality Project

1.GENERAL INFORMATION

Arrival Time/Date:	Departure Time	
Purpose Of Visit (circle one): Wet / Dry - Weather Event	t	
Names of Sampling Staff:		
Other Personnel On Site:		
Photos taken: Yes / No Time	Description:	
A NUT A TIMED		
2.WEATHER		
Circle one: Clear / Cloudy / Rain	Donton	
If Rain, Storm Start Date/Time:	Duration: Rain Depth	
3. OBSERVED PHYSICAL PROPERTIES (circle one):		
Odors (musty, sewage, sulfur, sour, gas, solvents, other)	Yes / No Describe:	
Floating material	Yes / No Describe:	
Suspended material	Yes / No Describe:	
Sheen	Yes / No Describe:	
Discolorations	Yes / No Describe:	
Record estimated % of flow bypassing inlet:	%	
Sediment accumulation in pretreatment unit (in):	inches	
4. WATER QUALITY SAMPLES		
Sample ID	Sample ID	
TimeAM/PM		
Water temperature °C	Water temperature °C	
TurbidityNTU	Turbidity NTU	
pHS.U.	pHS.U.	
Conductivity µS/cm	ConductivityµS/cm	
Dissoved Oxygenmg/L	Dissoved Oxygenmg/L	
5. VISUAL OBSERVATIONS		
bservation Locations (describe any 'yes' responses from So	Section 3 as well as reason for hypass	
se site ID in all notes	beeton 3, as wen as reason for sypass	
se sue 15 in an notes		
ater Quality Samples	Meter Type:	
se site ID in all notes	Meter ID:	
	Last Calibration:	
ote any other relevant environmental observations (e.g., tr	trash, vegetation health, vandalism, etc.)	
se site ID in all notes		
omments (equpiment issues, factors that may affect sample	nla quality, problems ancutnared, etc.)	
omments (equipment issues, factors that may affect sample	pro quanty, problems encumened, etc.)	
GNED:		
· · ·		



ATTACHMENTS FOR SECTION 2.6:

O & M





engineers | scientists | innovators

Operations and Maintenance Plan

Metro Orange Line Water Infiltration and Quality Project

1. INTRODUCTION

The Metro Orange Line Water Infiltration and Quality Project ("Project") proposes to design and implement distributed low impact development (LID) infiltration best management practices (BMPs) within LA Metro parcels and right-of-way (ROW) in the San Fernando Valley. The Project will coincide with the Metro Orange Line Bus Rail Transit (MOL BRT) Improvement Project, one of Metro's capital improvement projects. The purpose and need of the Project is to capture and infiltrate stormwater runoff, to improve downstream water quality, help recharge the groundwater basin, and mitigate localized nuisance flooding in disadvantaged communities and neighborhoods with significant unmet needs within the neighboring geographical area. This will be accomplished through the installation of 168 drywells, as well as underground pretreatment facilities, separated into seven geographic clusters.

2. MAINTENANCE PROCEDURES

This Operations and Maintenance (O&M) Plan describes the operations and maintenance procedures associated with the Project, with the intent to provide the continued optimal performance of the project components per design intent. The recommendations herein reflect the current standard of care for stormwater management Best Management Practices (BMPs) in the region. Appropriate health and safety precautions (e.g., personal protective equipment, confined space entry, traffic control, etc.) should be followed at all times during maintenance.

This O&M Plan has been developed as part of the Project Feasibility Study. Project facility locations and other project specifics are subject to change prior to or during the Project construction process. Therefore, some details in this plan will be determined at a later stage of project development. These details may include, but are not limited to, the following:

- Record drawings;
- Number of systems to be maintained;
- System configurations; and
- BMP ID numbers for use in field forms.

2.1 Maintenance Schedule

A minimum quarterly maintenance schedule for each proposed BMP is outlined below in Table 1. Additional maintenance may be necessary, depending on specific field observations or site conditions. O&M activities may also be coordinated with monitoring activities, although the two schedules may not align precisely.

Table 1 - Minimum Maintenance Schedule

ВМР	January – March	April – June	July – September	October – December
Underground Pretreatment Galleries (Inspection)	Once	Once	Once	Once
Underground Pretreatment Galleries (Cleaning)	Once	Not Required	Once	Not Required
Drywells (Inspection)	Not required	Not Required	Once	Once
Drywells (Cleaning)		Once every	y five years	
Pump Station (Inspection)	Once	Once	Once	Once
Pump Station (Cleaning)	Once	Not Required	Once	Not Required

Note: Maintenance activities are recommended to be performed following significant rain events, or on an as-needed basis if the maintenance conditions listed in Section 2.2.1 and Section 2.2.2 (below) are observed during routine inspection and/or monitoring.

2.2 Maintenance Activities

Planned maintenance activities for each of the underground pretreatment galleries and the drywells themselves are presented below.

2.2.1 Underground Pretreatment Galleries

Flows to seven drywell clusters are pretreated via underground pretreatment galleries (StormTrap DoubleTrap® or equivalent). Flows that enter the pretreatment galleries via the diversion structure either infiltrate through the bottom of the galleries or pass through the outlet and continue to the drywells. Maintenance activities for underground pretreatment galleries consist of:

- Inspecting for and removing inlet and outlet obstructions that may impede flows through the system. This can be accomplished through water jetting or the use of a hook with a long arm;
- Removing trash, debris, and sediment that may prevent infiltration in the galleries when they fill 10% or more of the unit's volume, as measured using a calibrated pole. A truck-mounted hydro-vactor should be used in tandem with sewer jetting equipment to flush sediment toward a vacuum hose for removal, suctioning the materials through a piping system into the vactor truck for off-site disposal. Most often, this work is to be performed by a specialized contractor; and

• Documenting all maintenance performed on the field forms. Example forms are provided in Appendix A.

Note: The pretreatment galleries should not be entered under any circumstances without approved confined entry permitting. If person entry is required, do not enter unless properly equipped, trained, and qualified for confined entry.

Additional pretreatment gallery maintenance reference information is provided in Appendix B.

2.2.2 Drywells

Maintenance activities for drywells consist of:

- Removing and disposing of trash and debris from inside the drywell chambers;
- Vacuuming sediment from inside the drywell chambers when greater than 15% of the primary settling chambers' capacity is filled;
- Checking inlet, intake, connector, and drainage pipes for obstructions;
- Removing the debris shield cover and clearing the debris shield, if clogged (Figure 1);
- Replacing absorbent petrochemical sponge, if necessary; and
- Documenting all maintenance performed on the field forms. Example forms are provided in Appendix A.

Note: The drywell chambers should not be entered under any circumstances without approved confined entry permitting. If manned entry is required, do not enter unless properly equipped, trained, and qualified for confined entry.

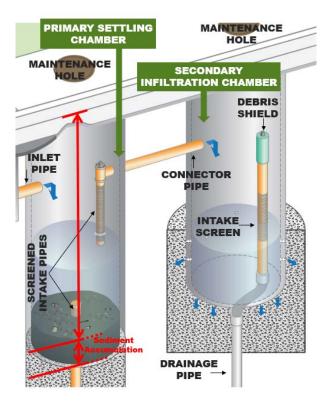


Figure 2 -Drywell Diagram

Additional reference information for drywells is provided in Appendix C.

2.2.3 Pump Station

Maintenance activities for the pump stations consist of:

- Removing accumulated sediment and debris from wet well;
- Testing the Programmable Logic Controller (PLC) system;
- Inspecting, replacing, and maintaining pumps based on the pump maintenance document provided by the manufacturer;
- Inspecting the submersible pressure transducer and control cable to ensure proper operation. Re-calibrating and repairing based on manufacturers' recommendations;
- Inspecting all pressurized pipe, bends, connections, reducers, and flanges for leakage and repair if necessary;
- Inspecting areas with underground pressurized pipes and pressure sensor conduits to ensure all pipe and conduits are buried and protected;
- Inspecting pressurized pipe outlets for debris/sediment build-up and blockages; and

• Inspecting pipe stanchions for damage including cracks, bending, irregularities, fractures, and corrosion and repairing or replacing (if necessary).

2.3 Maintenance Equipment

Equipment necessary for maintenance consists of:

- Personal protective equipment (PPE);
 - Safety vests and gloves should be worn at all times. If mechanical equipment is used during maintenance, also include safety glasses, hard hats, ear plugs, and steel toe boots. If confined space entry is required, additional PPE may be required.
- Trash bags;
- Pole, to measure sediment depth in underground pretreatment galleries and drywell chambers, and record of 0% depth for each unit for comparison;
- Replacement absorbent petrochemical sponges for drywells;
- Manhole lifter rated to lift 350 pounds;
- Vactor truck, as needed;
- Equipment necessary to clear debris from pipes and drywell debris shields (e.g., drain cables, water jet, hook with long arm, tools to remove debris shield cover);
- Camera to document maintenance activities; and
- Field forms to document maintenance activities.

3. MAINTENANCE COST

Table 2 summarizes the annual average labor and equipment cost associated with the O&M schedules and activities described above.

Table 2. Maintenance Cost Summary

BMP Component	Labor Hours	Maintenance Days	Labor Cost ¹	Equipment Cost ²	Total Cost
Drywells	295	9	\$29,500	\$40,500	\$70,000
Underground Pretreatment Galleries	1,375	43	\$137,500	\$193,500	\$331,000
Pump Station	1,420	44	\$142,000	\$198,000	\$340,000
Subtotal	3,090	96	\$309,000	\$432,000	\$741,000

O&M Plan

Estimated based on an hourly labor rate of \$100/hour
 Estimated based on a daily vaccum truck rental rate of \$4,900/day

APPENDIX AExample Field Forms

Field Staff:				Maintenance Field Log Date/Time:									
,	Date:		Гіme:		Maintenance S	Staff:							
Days since last rain event:					Weather Condit	ions:							
Drywells (Annually)	Unit ID:	Unit ID:	Unit ID:	Unit ID:	Unit ID:	Unit ID:	Unit ID:	Unit ID:	Unit ID:				
Vacuumed? (Y/N)													
Debris Shield Unclogged? (Y/N)													
Absorbent Sponge Replaced? (Y/N)													
Photos Taken? (Y/N)													
Additional Maintenance Documentation	:												
Unit ID:													
Unit ID:													
Unit ID:													
Unit ID:													
Unit ID:													
Unit ID:													
Unit ID:													
onit ib.													
Unit ID:													
Unit ID:													
	i i												

Field Staff:			Maintenance Field Log Date/Time:						
Da	ate:	т	me:		Maintenance Staff:				
Days since last rain eve	ent:				Weather Condit	ions:			
Stormwater Vault and Cistern (Annually)	Gallery ID:	Gallery ID:	Gallery ID:	Gallery ID:	Gallery ID:	Gallery ID:	Gallery ID:		
Evidence of Obstruction? (Y/N)									
Depth of Sediment?									
Photos Taken? (Y/N)									

Additional Maintenance Documentation:	
Unit ID:	

APPENDIX B

Reference Underground Pretreatment Gallery Maintenance Information

O & M MAUALS

STORMTRAP



StormTrap Maintenance Manual

1. Introduction

Regular inspections are recommended to ensure that the system is functioning as designed. Please call your Authorized StormTrap Representative if you have questions in regards to the inspection and maintenance of the StormTrap system. Prior to entry into any underground storm sewer or underground detention systems, appropriate OSHA and local safety regulations and guidelines should be followed.

2. Inspection Schedules for Municipalities

StormTrap Stormwater Management Systems are recommended for inspection whenever the upstream and downstream catch basins and stormwater pipes of the stormwater collection system are inspected or maintained. This will economize the cost of the inspection if it is done at the same time the Municipal crews are visiting the area.

3. Inspection Schedules for Private Development

StormTrap Stormwater Mangement Systems, for a private development, are recommended for inspection after each major storm water event. At a minimum, until a cleaning schedule can be established, an annual inspection is recommended. If inspected on an annual basis, the inspection should be conducted before the stormwater season begins to be sure that everything is functioning properly for the upcoming storm season.

4. Inspection Process

Inspections should be done such that at least 2-3 days has lapsed since the most recent rain event to allow for draining. Visually inspect the system at all manhole locations. Utilizing a sediment pole, measure and document the amount of silt at each manhole location. Inspect each pipe opening to ensure that the silt level or any foreign objects are not blocking the pipes. Be sure to inspect the outlet pipe(s) because this is typically the smallest pipe in the system. It is common that most of the larger materials will be collected upstream of the system in catch basins, and it is therefore important at time of inspections to check these structures for large trash or blockages.

Remove any blockages if you can during the inspection process only if you can do so safely from the top of the system without entering into the system. **Do not go into the system under any circumstances** without proper ventilation equipment and training. Pass any information requiring action onto the appropriate maintenance personnel if you cannot remove the blockages from above during the inspection process. Be sure to describe the location of each manhole and the type of material that needs to be removed.

The sediment level of the system should also be measured and recorded during the inspection process. Recording the sediment level at each manhole is very important in order get a history of sediment that can be graphed over time (i.e. years) in order to estimate when the system will

need to be maintained next. It is also important to keep these records to verify that the inspection process was actually performed if anyone asks for your records in the future.

The sediment level in the underground detention system can be determined from the outside of the system by opening up all the manholes and using a sediment pole to measure the amount of sediment at each location. Force the stick to the bottom of the system and then remove it and measure the amount of sediment at that location. Again, do not go into the system under any circumstances without proper ventilation equipment and training.

5. When to Clean the System

Any blockages should be safely removed as soon as practical so that the Stormwater detention system will fill and drain properly before the next stormwater event.

The Dry Detention System should be completely cleaned whenever the sediment occupies more than 10% to 15% of the originally designed system's volume. The Wet Detention System should be cleaned when the sediment occupies more than 30% or $1/3^{rd}$ of the originally designed system's volume. NOTE: Check with your municipality in regards to cleaning criteria, as the allowable sediment before cleaning may be more or less then described above.

6. How to Clean the StormTrap

The system should be completely cleaned back to 100% of the originally designed storage volume whenever the above sediment levels have been reached. Be sure to wait at least 3 days after a stormwater event to be sure that the system is completely drained (if it is a Dry Detention System), and all of the sediments have settled to the bottom of the system (if it is a Wet Detention System).

Do not enter the System unless you are properly trained, equipped, and qualified to enter a confined space as identified by local occupational safety and health regulations.

There are many maintenance companies that are in business to help you clean your underground stormwater detention systems and water quality units. Please call your StormTrap representative for referrals in your area.

A. Dry Detention System Cleaning

Maintenance is typically performed using a vacuum truck. Sediment should be flushed towards a vacuum hose for thorough removal. For a Dry Detention System, remove the manhole cover at the top of the system and lower a vacuum hose into one of the rows of the StormTrap system. Open up the manhole at the opposite end of the StormTrap and use sewer jetting equipment to force water in the same row from one end of the StormTrap row to the opposite side. The rows of the StormTrap are completely open in one contiguous channel from one end to the other for easy cleaning.

Place the vacuum hose and the sewer jetting equipment in the next row and repeat the process until all of the rows have been cleaned.

When finished, replace all covers that were removed and dispose of the collected material properly.

7. Proof of these inspections is the responsibility of the property owner. All inspection reports and data should be kept on site or at a location where they will be accessible for years in the future. Some municipalities require these inspection and cleaning reports to be forwarded to the proper governmental permitting agency on an annual basis.

Refer to your local and national regulations for any additional maintenance requirements and schedules not contained herein. Inspections should be a part of your standard operating procedure.



STORMITARY, LLC

SYLCHING THIS DOCUMENT YOU AGREE WITH THE INVERT ELEMITIONS, ACCESS OPENING SIZES AND LOCATIONS, PIPE DUMERTERS, PIPE INVERTERAL, AND PIPE LOCATIONS OF THE CHAINNESS PAYED THAT LIFE STRUCTURE OF THE CHAINNESS PAYED THAT LIFE AND THE CHAINNESS PAYED THAT LIFE AND THE AND THE CHAINNESS PAYED THAT LIFE AND THE AND THE AND THAT LIFE AND THAT AND THAT LIFE AND THAT THE CHAINNESS PAYED THAT LIFE AND THAT LIF

APPROVED: APPROVED WITH CHANGES:

INSTALLING CONTRACTOR

APPROVED: APPROVED WITH CHANGES: 🔲

REJECTED | REJECTED. DATE // DATE

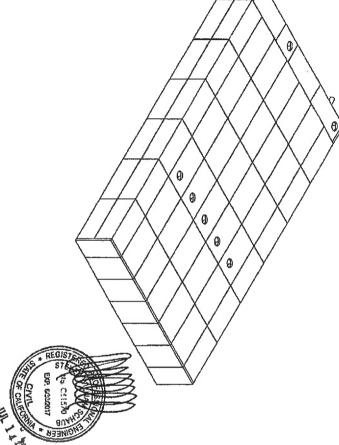
DATE (/)

CIVIL ENGINEER:

APPROVED: APPROVED WITH CHANGES:

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GENERAL CONTRACTOR:



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|--|

ENGINEERING COMPANY:

GEOSYNTEC CONSULTANTS

CONTACT NAME: CONTACT PHONE: CONTACT FAX:

REBECCA BATCHELDER 310-957-6100 310-957-6101

STORM TRAP SUPPLIER: CONTACT PHONE: CONTACT PHONE: CONTACT EMAIL: WATER STORAGE PROVI MIEH STORAGE REOD SS,000.00 CUBIC FEET
SS,S40.00 CUBIC FEET
117-0" DOUBLETRAP STORMTRAP
NATHAN TOWLESTON
SC2-300
SC2-300
NTOWLESTON@STORMTRAP.COM

UNIT QUANTITY

92 TOTAL PIECES

BROADWAY NEIGHBORHOOD STORMWATER GREENWAY

LOS ANGELES, CA

	\perp	2.0 DOUBLETRAP INSTALLATION SPECIFICATIONS 2.0 DOUBLETRAP INSTALLATION SPECIFICATIONS	AGE DESCRIPTION OD COVERSMEET	SHEET INDEX
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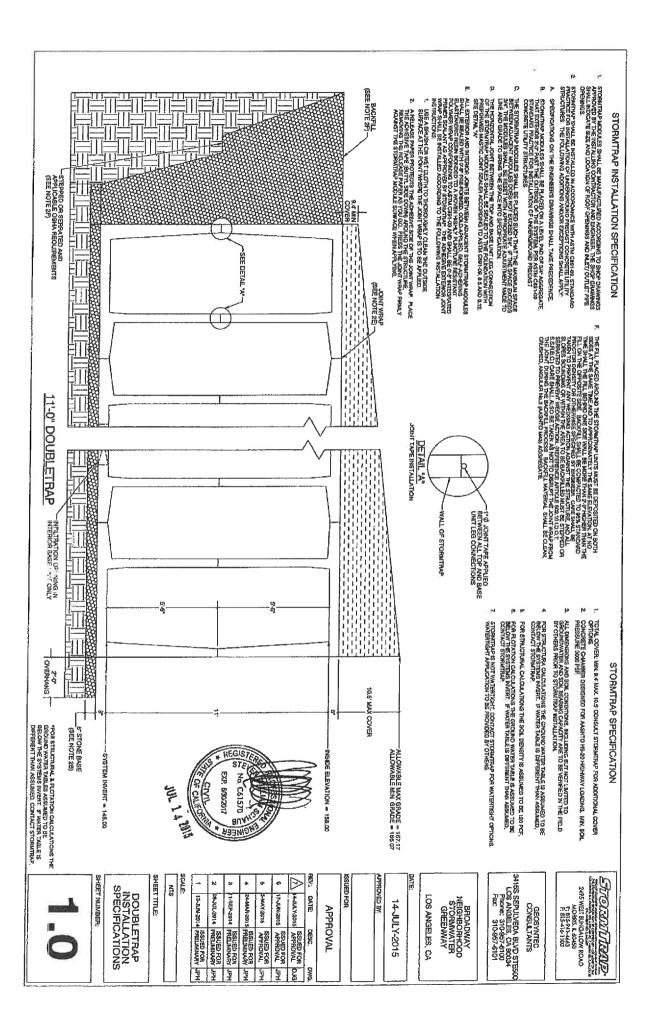
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COVER: MRV: 9.6 - MAX: 10.5
GACUNUMAYER TABLE: BELOW THE SYSTEMS INVERT
SOL PRESSURE: 3000 PSF
LIDADING: AASHTO HS:20 HIGHWAY LOADING

DESIGN ASSUMPTIONS



RECOMMENDED ACCESS OPENING SPECIFICATION

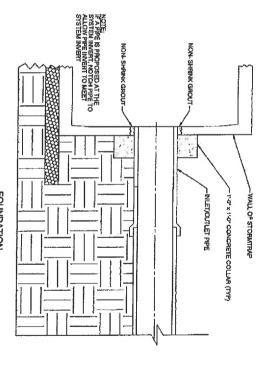
- A TYPIOLA ACCESS OPENING FOR THE STORMTHAP SYSTEM ARE 24° M DAMETER.
 ACCESS OPENINGS LARGER THAN 24° N.O.METER NEED TO BE APPROVED BY
 STORMTHAP ALL OPENINGS MUST TEITMAN TEAST "TO" CLEMPANCE IN ALL
 DIECTIONS FROM THE EDGE OF THE STORMTRAP UNITS.
- 2. PLASTIC COANTED STEER, STEER RADDUCED BY MAA BOUSTINES PAIT AFFECT CREE

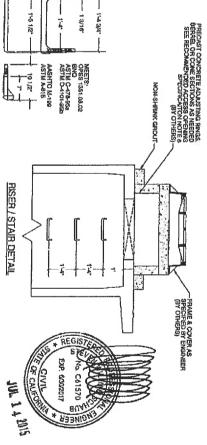
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 HIGHEST STEEN M THE LIMIT IS TO BE PLACED A DISTANCE OF THE PROMIT THE INBURSE EDGE
 OF THE STORMATHAD WHITE, ALL ESSENING STEER SHALL BE FUNCED WHITE A WANAMAM
 DISTANCE OF THE RESIVED THESE MY THE MOVED OR ALTERED TO AVOID
 OF SMINGS ON THE PRESENTANTEES MY THE MAT.
- 4. STORMTRAP ACCESS OPENINGS MAY BE RELOCATED TO AVOID INTERFERENCE WITH BILET AND/OR OUTLET PIPE OPENINGS BO PLACEMENT OF STEPS IS ATTAINABLE. STORWITH LITTING INSIGHTS MAY HE RELOCATED TO CONCIDE WITH THE ACCESS OPENING OR THE CENTER OF CHANTY OF THE UNIT AS NEEDED.
- ACCESS OPENNOS SHOULD BE LOCATED IN DIRER INFER THE APPROPRIATE MUNICIPAL RECOMPENDENTS STORMITAP RECOMMENDS AT LEAST ONE ACCESS OPENING PER SYSTEM FOR ACCESS AND INSPECTION
- 8. USE PRECAST ADJUSTING RINGS AS NEEDED TO MEET GRADE. STORMTRAP RECOMMENDS FOR COVER OVER 2: TO USE PRECAST BATREL OR CONE SECTIONS, (BY OTHERS)

RECOMMENDED PIPE OPENING SPECIFICATION

- 1. MINIMALM EDGE DISTANCE FOR AN OPENING ON THE OUTSIDE WALL SHALL BE NO LESS THAN 1-0!
- 2 MANAIM OPENNIG SIZE TO BE DETIENAINED BY UNIT HEIGHT. PRETERRED OPENING SIZE OF ONL USS. MY OPENING NEEDED THAT DOES NOT FIT THIS CRITERIA SHALL BE BROAGHT TO THE ATTENTION OF STORAFTING FOR REFERE OLD AND A AGREGATE CONCUENT AS SHALL BE INSTALLED WITH A 10° CONCRETE COLLAY, AND A AGREGATE COUDE FOR AT LEAST ONL PRETECORITY, AS SHOWN. A STRUCTURAL GROAD CONCRETE ON GROOT WITH A MANAMA 28 DAY COMPRESSING STRENGTH OF GOOD PSI SHALL BE USED.
- 4. THE ANNULAS SPACE BETWEEN THE PIPE AND THE HOLE SHALL BE FILLED WITH NOW-SHRINK GROUT.

- 1. CLEAN AND LIGHTLY LUBRICATE ALL OF PIPE TO BETWEETED INTO STORMTRAP.
- 2. IF PPE IS CUT, CARE SHOULD BE TAKEN TO ALLOW NO SHARP EDGES. BEVEL AND LUBRICATE LEAD END OF PIPE.
- ALIGN CENTER OF PIPE TO CORRECT ELEVATION AND INSERT INTO OPENING.
- RECOMMENDED PIPE INSTALLATION INSTRUCTIONS





PIPE CONNECTION

SEN

13-JUN-2014 PRELIMINARY JPH

SHEET TITLE

RECOMMENDED DOUBLELETRAP INSTALLATION SPECIFICATIONS

BET NUMBER:

STAIR DETAIL

ESTOCIANTIPATE

MINISTER STRUCTURE

245 WES BINGALON ROAD

NORSEL (AUSO

P. 815-414-463

P. 815-416-1100

9416S SEPULVEDA BLVD STE500 LOS ANGELES, CA 90034 Phone: 310-957-6100 Fax: 310-957-6101 GEOSYNTEC CONSULTANTS

BROADWAY NEIGHBORHOOD STORMWATER GREENWAY

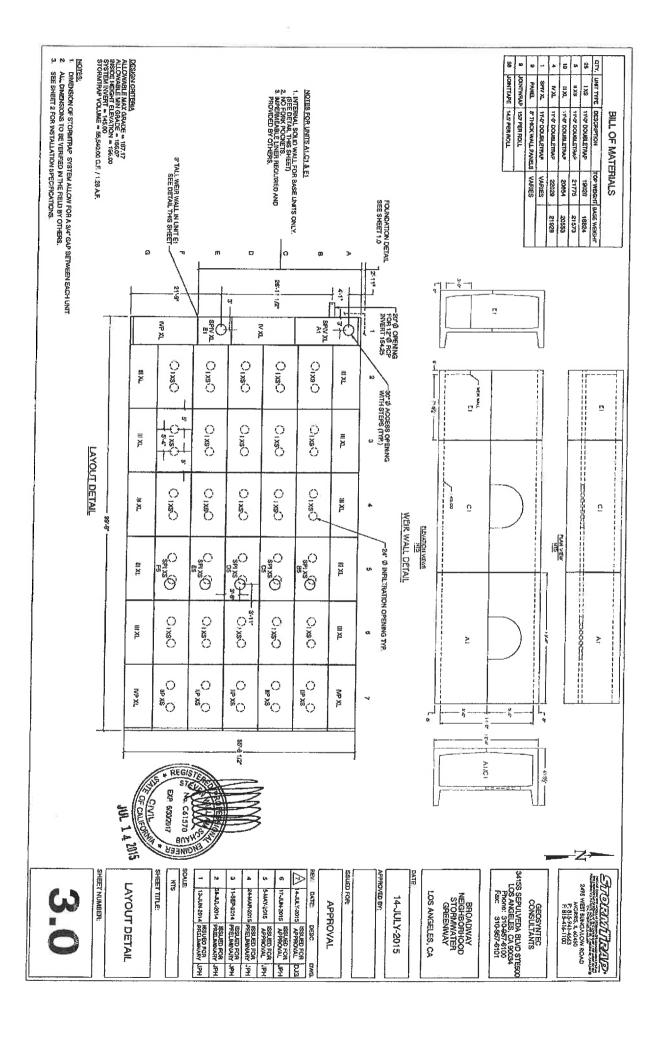
LOS ANGELES, CA

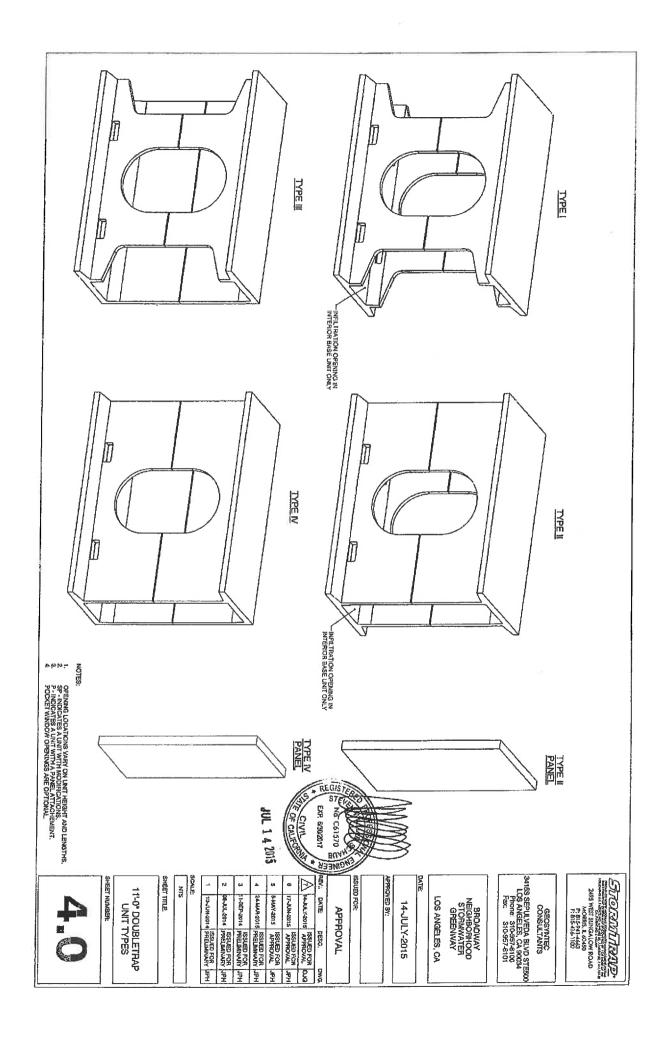
14-JULY-2015

PROVED BY:

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TRY DATE DESC. 1 NULY SOIS APPROVAL DUG DI-JUL-2014 RSSUED FOR JPH TAJUK 2015 APPROVAL JPH 13-SEP 2014 PRELIMINARY JPH 24-MAR-2015 PRELIMINARY JPH S-MAY-2015 APPROVAL JPH







WARRANTY

8.1 Warranty Statements

- 1. StormTrap LLC warrants to the Purchaser that the StormTrap[®] modules, when installed strictly in accordance with StormTrap LLC's written installation instructions, are of the quality set forth in the specifications published by StormTrap LLC for such module for a warranty period of 5 years. The warranty period shall commence starting the last day of installation of any module.
- StormTrap LLC further warrants to the Purchaser that the products to be delivered hereunder shall be free of defects in materials and workmanship in normal use and service for a warranty period of 5 years.

8.2 Limits to Warranty

This is a Limited Warranty that applies solely to the precast concrete StormTrap[®] modules and is exclusive and in lieu of all other warranties (whether expressed, implied, or statutory). EXCEPT AS SET FORTH IN THE WARRANTY STATEMENTS, STORMTRAP LLC MAKES NO EXPRESS OR IMPLIED WARRANTY THAT THE PRODUCTS SOLD HEREUNDER ARE OF MERCHANTABLE QUALITY, ARE FIT FOR

ANY PARTICULAR PURPOSE, COMPLY WITH REQUIREMENTS
OF ANY SAFETY CODE OR COMPLY WITH THE LAWS AND
REGULATIONS OF ANY STATE, MUNICIPALITY OR OTHER
JURISDICTION.

8.3 Limits to Beneficiaries and Damages and Claims

- This limited warranty is given only to the Purchaser. It may not be assigned to any party other than Purchaser and there are no third party beneficiaries to this limited warranty.
- 2. IN NO EVENT SHALL StormTrap LLC BE LIABLE FOR SPECIAL, INDIRECT, ECONOMIC, INCIDENTAL, EXEMPLARY, PUNITIVE OR CONSEQUENTIAL DAMAGES, AND StormTrap LLC SHALL NOT BE LIABLE FOR PENALTIES OR LIQUIDATED DAMAGES, INCLUDING LOSS OF PRODUCTION AND PROFITS, LABOR AND MATERIALS, OVERHEAD COSTS, OR ANY LOSS OR EXPENSE INCURRED BY THE PURCHASER OR ANY THIRD PARTY.
- 3. StormTrap LLC's obligation under this warranty shall not include any freight or transportation charges or costs of installation.
- 4. StormTrap LLC's TOTAL LIABILITY TO PURCHASER SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE StormTrap® MODULES IN RESPECT TO WHICH ANY CLAIM UNDER THIS WARRANTY ARISES, OR FOR ANY AND ALL CLAIMS ARISING OUT OF ANY CAUSE WHATSOEVER, WHETHER BASED IN CONTRACT, NEGLIGENCE OR OTHER TORT STRICT LIABILITY OR OTHERWISE.
- 5. THIS LIMITED WARRANTY IS THE EXCLUSIVE REMEDY FOR PURCHASER WITH RESPECT TO THE StormTrap® MODULES.

 StormTrap LLC shall not be liable to the Purchaser or to any third party for any other product liability claims; claims arising from design, shipment, or installation of the StormTrap® modules, or the cost of other goods or services related to the purchase and installation of the StormTrap® modules.

8.4 Limitations Due to Installation, Handling and Use

- 1. For this Limited Warranty to apply, the StormTrap[®] modules must be installed in accordance with all conditions required by state and local codes; all other applicable laws and regulations; and StormTrap LLC's written installation instructions.
- 2. This warranty shall not apply to any StormTrap[®] modules which have been subjected to damage from abuse or mishandling, or which have been repaired or modified by anyone other than StormTrap LLC.
- 2. Excluded from this limited warranty are damages due to alteration, accident, misuse, abuse or neglect; the StormTrap[®] modules being subject to conditions which are not permitted by StormTrap LLC's design criteria or installation instructions; such as but not limited to failure to maintain the minimum cover or exceed the maximum cover to grade set forth in the design criteria or installation instructions; failure to install within tolerance and set true to line and grade as set forth in the specifications or installation instructions; the placement of improper bedding or backfill materials; improper installation, bedding, or backfill techniques; failure of the product due to improper application or improper sizing; or any other event not caused by StormTrap LLC.

8.5 No Other Expressed Warranty

- Except as specified herein, no other expressed warranty is given and no affirmation on Seller's part or on the part of Seller's representatives or agents, by work or act, shall constitute a warranty.
- No representative of StormTrap LLC has the authority to change this
 Limited Warranty in any manner or to extend this Limited Warranty,
 unless written confirmation is provided by an officer of StormTrap LLC.

8.6 Remedies

1. If a breach of this warranty shall become apparent to the purchaser, the purchaser has the responsibility to provide StormTrap LLC with prompt written notice of the alleged breach at StormTrap LLC's company headquarters. This notice shall be provided within 30 days of the discovery of the alleged defect and shall describe it in detail. AS THE SOLE AND EXCLUSIVE REMEDY TO PURCHASER FOR SUCH BREACH, StormTrap LLC AGREES TO PROVIDE REPLACEMENT MODULES OR REPAIR THOSE MODULES DETERMINED BY StormTrap LLC TO BE DEFECTIVE AND COVERED BY THIS LIMITED WARRANTY. Removal and/or installation of the replacement modules is the responsibility of the purchaser and specifically excluded by StormTrap LLC.

C\683886.2

APPENDIX C

Reference Drywell Maintenance Information

Maintenance

The responsible property owner, such as a Property Management Company or Homeowners Association, is responsible for maintaining the drywell(s) after development.

Standing water problems are usually caused by inadequate performance of the existing drainage systems on the property. Reasons are varied but may be due to system aging, reduced soil permeability, inefficient or outdated design, pavement settlement, ineffective site maintenance, property expansions and additions, or changed property usage.

If a drywell is draining slowly or water stands on the surface for longer than regulations allow, debris may simply be blocking the inlet. The maintenance guidelines begin with the performance of an annual inspection which will include assessing the need for cleaning, and inspecting the functional and structural continuity of the system. At the same time, surface aspects of the drainage way are evaluated for evidence of staining or standing water.

Cleaning with a truck-mounted hydro-vactor (see below) is recommended when silt and sediment are found to occupy 15% or more of the original effective settling capacity of the inlet chamber. The maintenance operation utilizes air and high-pressure water to dislodge this built-up material, which is then suctioned through a piping system into the vactor truck and disposed of off-site.

Inlet grates and covers are removed for this operation, and all filters and screens are serviced during this procedure. At the same time, any obstructions or accumulated debris in remote inlets and connecting piping is removed by jet-rodding. The cleaning operation also involves replacement of the floating absorbent pillows and changing out the filter fabric at the bottom of the chambers, if so equipped. If there are no obvious blockages noted during the inspection procedure, it is possible that a thorough cleaning may restore the well to optimal service.

After the initial cleaning, most systems generally will not require subsequent cleaning for 3-5 years. If afforded reasonable maintenance practices, our records indicate that our MaxWell Drywells will provide many years of efficient, reliable service.



Typical Hydrovactor Truck used for Drywell Maintenance

INSPECTION AND MAINTENANCE PROCEDURES FOR MAXWELL IV DRYWELL



RECOMMENDED INSPECTION PROCEDURES

<u>NEW INSTALLS</u> - ALL NEW DRYWELLS SHOULD BE INSPECTED AFTER THE FIRST FEW RAINFALLS TO ENSURE SYSTEM IS FUNCTIONING PROPERLY AND TO GET A SENSE OF HOW QUICKLY SEDIMENT, TRASH, AND DEBRIS IS ACCUMULATING.

ONGOING OPERATION - INSPECT SYSTEM PRIOR TO THE BEGINNING OF EACH RAINY SEASON (AUGUST/SEPTEMBER) OR ONCE ANNUALY. RECORD INSPECTON OBSERVATIONS IN MAINTENANCE LOG BOOK.

RECOMMENDED MAINTENANCE

DRYWELL SHOULD BE CLEANED WHEN THERE IS AT LEAST 2' OF ACCUMULATION OF SEDIMENT, TRASH, AND DEBRIS.

SPECIFIC MAINTENANCE POINTS ARE SHOWN BELOW:

○ ITEM NUMBERS

- 1. REMOVE, CLEAN, AND REPLACE MANHOLE GRATE.
- 2. LOOSEN AND VACTOR OUT COLLECTED SEDIMENT, TRASH, AND DEBRIS.
- 3. CHECK TO MAKE SURE OVERFLOW PIPE BRACKET IS SECURE. TIGHTEN OR ADD SCREWS AS NEEDED.
- REMOVE, CLEAN, AND REPLACE SCREEN AND SHIELD ON TOP OF OVERFLOW PIPE.
- 5. REMOVE AND DISPOSE OF SPENT HYDROCARBON PILLOW. PLACE NEW PILLOW (128 OZ MIN CAPACITY) PRIOR TO REPLACING GRATE.
- REMOVE AND DISPOSE OF GEOTEXTILE FABRIC (AS APPLICABLE). WRAP NEW FABRIC OVER SLOTTED SCREEN AND SECURE IN PLACE.

(3)

DISPOSE OF WASTE IN ACCORDANCE WITH LOCAL LAWS AND REQUIREMENTS.

ALL MAINTENANCE ACTIVITIES, INSPECTION OBSERVATIONS, AND REPAIRS SHALL BE RECORDED IN THE MAINTENANCE LOG BOOK.

FOR MORE INFORMATION ABOUT MAINTENANCE, INSPECTION, AND REPAIRS, PLEASE CONTACT TORRENT RESOURCES.

TORRENT RESOURCES 9950 ALDER AVENUE BLOOMINGTION, CA 92316 909-829-8740 | OFFICE



ATTACHMENTS FOR SECTION 3.2:

24-HOUR STORM CAPACITY





engineers | scientists | innovators

24-Hour Runoff Management Capacity Calculation

Metro Orange Line Water Infiltration and Quality Project

As part of the Safe Clean Water Program Feasibility Study for the Metro Orange Line Water Infiltration and Quality Project ("Project"), this attachment documents the calculation of the 24-hour capacity.

Infiltration BMPs include system of drywells with pre-treatment facilities. Based on the conceptual design shown in the uploaded attachment in "Design Elements – Configuration" section of this application, each drywell was modelled as a storage basin that provides 322 cubic feet of storage. As discussed in the geotechnical PDF attachment uploaded in "Design- Elements - Site Condition" section of this application, a design infiltration rate of 0.8 cfs/drywell was calculated based on review of available boring log and Cone Penetration Test (CPT) data.

Based on the infiltration BMP configuration above, the 24-hour managed volume, which is a required input to the SCW Project Module, was computed as the sum of storage and infiltrated volume over 24-hours. The result is summarized in Table 1.

Table 1. 24-Hour Managed Volume Calculation Summary

Storage Capacity	322 ft ³ per drywell
Percolation Rates	0.8 cfs/drywell
Number of Drywells	168
24-Hour Storage Volume (ac-ft)	1.2
24-Hour Infiltration Volume (ac-ft)	267
24-Hour Managed Volume (ac-ft)	268



ATTACHMENTS FOR SECTION 3.3:

EVENT-BASED DESIGN DETAILS





engineers | scientists | innovators

Event-based Hydrologic Modeling

Metro Orange Line Water Infiltration and Quality Project

1. INTRODUCTION

As part of the Safe Clean Water Program Feasibility Study for Metro Orange Line Water Infiltration and Quality Project ("Project"), this attachment documents the methodology and modeling results that support the quantified water quality and water supply benefits presented in the main report.

Given the nature of the proposed distributed infiltration BMPs, the Safe Clean Water project module's built-in modeling component cannot be utilized. Instead, the modeling work was performed using Los Angeles County's Watershed Management System 2.0 (WMMS 2.0). Detailed model development methodology is presented below.

2. MODEL DEVELOPMENT

WMMS 2.0 is the latest watershed modeling system that developed by Los Angeles Flood Control District. It is released to the public in May 2020. WMMS 2.0 is a thorough upgrade to WMMS 1.0 that was released in August 2013. In comparison to the previous version, WMMS 2.0 is calibrated based on hydrology and water quality monitoring data collected up to 2018 and hence can more accurately simulate contaminant loading, runoff volume, and flow rate associated with various design storms and long-term simulation for all major watershed within Los Angeles County. WMMS 2.0 contains two major components: a Loading Simulation Program in C++ (LSPC), which is a watershed modelling system to simulate runoff and pollutant loading; and a System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN), which utilizes LSPC model output and evaluates BMP performance in terms of pollutant load reduction and runoff volume reduction

For the WMMS 2.0 model, the baseline LSPC model was modified by editing the subwatershed boundary and hydrologic response unit (HRU) parameters to simulate dry and wet weather runoff from the Project drainage areas¹. The hydrologic response unit (HRU) within the revised subwaterhsed boundary was updated accordingly using the HRU raster downloaded from WMMS 2.0 website. A SUSTAIN model² was then developed to determine the design-storm and average annual stormwater capture volumes for a range of BMP configurations. This section describes the inputs used, the proposed sizing scenario and the results. It is assumed that the baseline LSPC model has been calibrated by LACFCD to reflect the hydrologic condition within each watershed in Los Angeles County. Default parameters were used unless site-specific modification was required (e.g. subwatershed boundary).

¹ Model input was developed and executed using LSPC v6.0 provided in the WMMS 2.0 application package

² Model input was developed and executed using SUSTAIN v2.1 provided in the WMM S 2.0 application package.

The remainder of the section focuses on describing the event-based simulation development of the WMMS 2.0 model.

3. ASSUMPTIONS AND APPROACH

The WMMS 2.0 input parameters assumed for each scenario included:

- Precipitation and Model Run Time: Taken directly from the baseline WMMS 2.0 database, the default rain gauges assigned to LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861. For the 24-hour 85th percentile design storm simulation, the 4-day unit hydrographs were downloaded from the WMMS 2.0 data repository. In accordance with the WMMS 2.0 simulation guidance, use of a 4-day storm is conservative for runoff volume because soils in the simulation would be fully saturated by the fourth day and therefore can be used for assessing runoff volume reduction. The 4-day hyetographs are shown in Figure 1.
- **Dry-weather Runoff Estimate:** The LSPC model simulation estimated the dry weather runoff as a function of irrigated pervious HRU. This was updated for the updated Project drainage area described above.
- Soils: Taken directly from the baseline WMMS model, the default WMMS soil parameters adopted from LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861were used in the simulation.
- **Routing:** Stormwater and dry weather runoff routing as illustrated in Figure 2 was set up in the SUSTAIN model to evaluate the proposed BMP configuration and dimensions. Consistent with the drywell cluster drainage areas shown in Figure 3, a total of seven 24-hour³ design storm hydrograph outputs were included in the SUSTAIN model. During the simulation, bypass from any BMP cluster is considered overall bypass is not routed to any downstream BMP.

4. **RESULTS**

This section summarizes the modeling output. All model input and output files are provided in Appendix A.

Key inputs and results from the WMMS model are summarized in Table 1 for the 24-hour, 85th-percentile design storm event model. The results were aggregated from all the drainage area and organized in accordance with the input required specified in the SCW Project Module.

³ While the total simulation time of the 24-hour 85th percentile design storm is four days, only the hydrograph from the last 24-hour was used for subsequent BMP routing analyses

Table 1. Summary of Model Key Inputs and Results (24-Hour 85th-Percentile Design Storm)

		Ke	ey Modeling Inp	out				
Design Storm	Design Storm Rainfall Total (inches) 1.1 ⁴							
Total Number	Total Number of Drywells Modeled							
Infiltration Ca	pacity per Drywel	l (cfs)				0.8		
	Key Modeling Output							
Drywell Cluster	LSPC Subwatershed ID	Number of Drywells	Inflow Runoff Volume (ac-ft)	Capture Runoff Volume (ac-ft)	Bypass Runoff Volume (ac-ft)	Runoff Capture Percentage (%)		
MOL-1	6861	24	18	17	1	94%		
MOL-2	6856	40	44	38	6	86%		
MOL-3	6850	14	15	13	2	87%		
MOL-4	6844-1	39	37	33	4	89%		
MOL-5	6844-2	13	9	9	0	100%		

4

14

141

14

128

In summary, on an annual basis, based on the long-term simulation, the proposed Project is projected to capture 91% runoff from the 24-hour 85th percentile design storm.

10

28

168

6665

6839

MOL-6

MOL-7

Total

0

0

14

100%

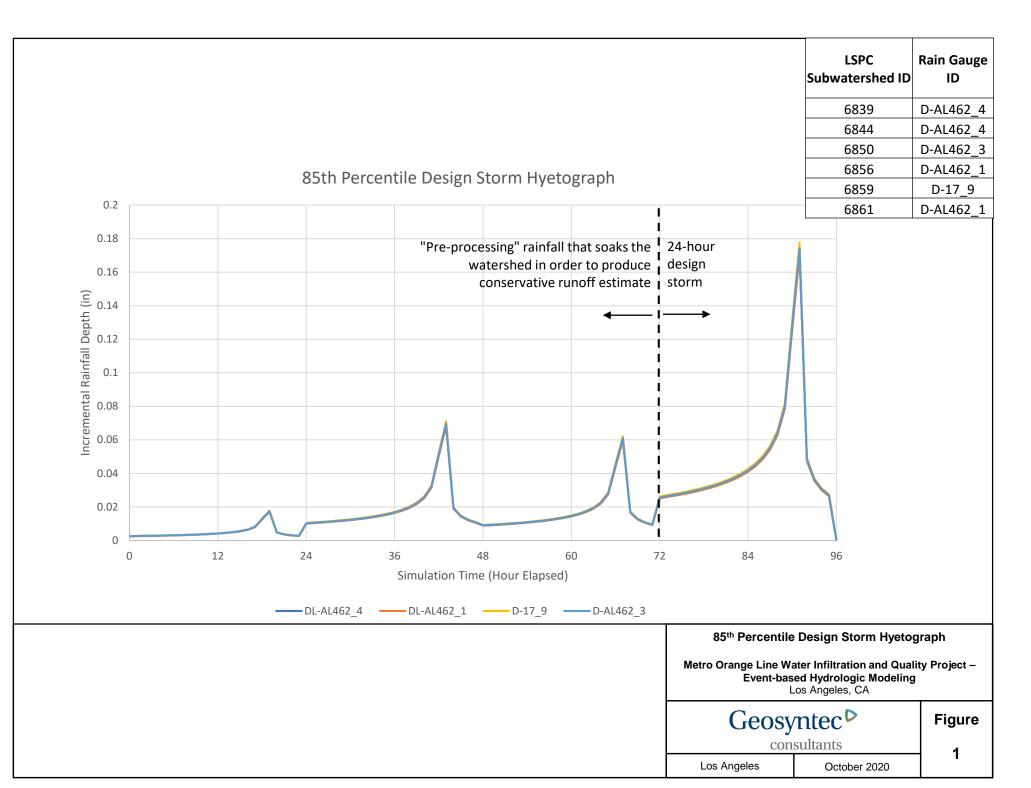
100%

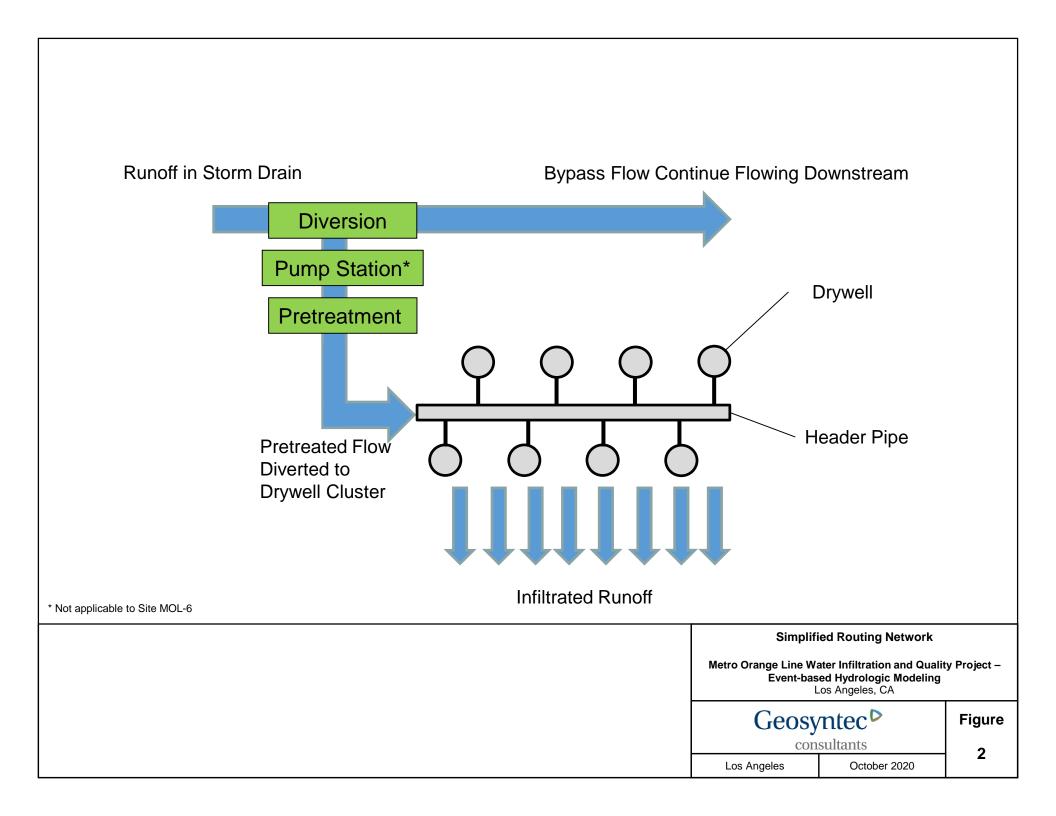
91%

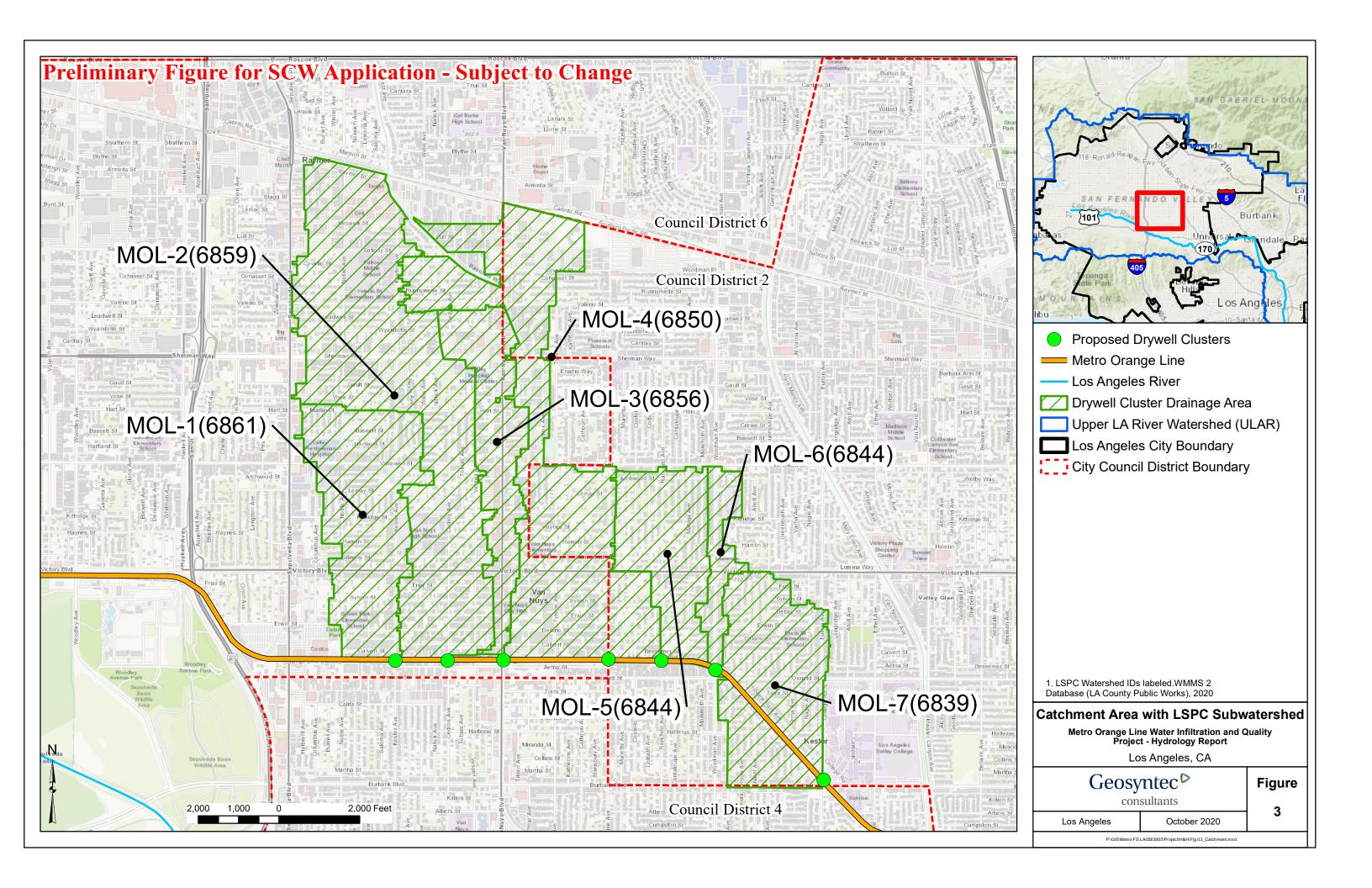
⁴ Average event-total depth of all rain gauges

FIGURES

Event-based Hydrologic Modeling







APPENDIX A

WMMS 2.0 LSPC and Sustain Model Input

*Output not included as it contains 10,000+ lines of times series output. Output can be provided as electronic copy upon request

LSPC Model – 85th Percentile 24-hour Storm Runoff Generation

```
c LSPC -- Loading Simulation Program, C++
c Version 6.0 (64-bit) - Jan 2020
c Created through code updates by:
c Paradigm Environmental, Inc.
c San Diego, California, USA
c www.paradigmh2o.com
c Based upon LSPC version 5.0 (Mar 2018), originally developed by :
c United States Environmental Protection Agency
c with support by Tetra Tech, Inc.
c https://github.com/USEPA/LSPC-Loading-Simulation-Program
c NOTE: The line starting with the letter c and followed by space or - is a comment line.
c There must be no comment line in between the data lines
       The input text field must be a continuous string without any space in between the characters
C
C-----
c LSPC MODEL INPUT FILE
c This input file was created at 00:13:57am on 09/11/2020
c0 general control
   snowfg if = 1 run snow module
pwatfg if = 1 run pwater
C
C
  sedfg
           if = 1 run sediment
  pqalfg if = 1 run general quality
C
   tempfg if = 1 run temperature module
oxfg if = 1 run DO-BOD module
С
  oxfg
C
  nutfg if = 1 run nutrients module
  plkfg if = 1 run plank module
phfg if = 1 run pH-CO2 module
C
С
c snowfg pwatfg sedfg pqalfg tempfg oxfg nutfg plkfg phfg
  0 1 1 1 0
C----
            ______
                          _____
c10 weather file definition (name and parameters)
C
С
    wfileid weather file id
   wfilename weather file name
С
   wparamnum number of parameters in the weather file
С
    wparamid weather paramter id
С
              1-precipitation (in/ivl)
              2-potential evaporation (in/ivl)
              3-air temperature (degree F)
C
С
              4-wind speed (mile/ivl)
              5-solar radiation (ly/ivl)
С
С
               6-dew point (degree F)
               7-cloud cover (tenth)
C
C
c wfileid wfilename wparamnum wparamid...
       1792 D-AL462_4.pre 1 1
1794 D-AL462_1.pre 1 1
            D-AL464_2.pre 1
       1796
            P-AL464_2.pre 1
                                 1
       1797
             P-AL462_1.pre 1
            D-17_9.pre
                           1
       1855
       1857 D-AL462_3.pre 1
2076 BLANK.air 1
                                 2
C-----
c15 weather station definition (station id and associated weather files)
С
С
    wstationid weather station id
    wfilenum number of files for the weather station
C
    wfileid weather file id (card 10)
С
C
   wstationid wfilenum wfileid...
С
       792 2 1792 2076
       794
                    1794
             2
                            2076
            2
2
       795
                    1795
                            2076
                   _
1796
       796
                            2076
                   1797
       797 2
                            2076
      855
-
                   1855
1857
             2
2
                            2076
       857
                            2076
```

```
c20 weather parameter multiplier
C
    wstationid weather station id (card 15)
С
               multiplier for each weather parameter
C
С
     1- multiplier for precipitation
       2- multiplier for potential evapotranspiration
С
      3- multiplier for air temperature
С
      4- multiplier for wind speed
       5- multiplier for solar radiation
С
       6- multiplier for dew point
С
       7- multiplier for cloud cover
C
C
c wstationid wparmmult1...
      tionid wpar.......
792 1.000000 1.000000
1 000000 1.000000

      795
      1.000000
      1.000000

      796
      1.000000
      1.000000

      797
      1.000000
      1.000000

      855
      1.000000
      1.000000

      857
      1.000000
      1.000000

C-----
c30 output file path input (weather) file path (each must be a continuous string)
      C-----
c40 general watershed controls
C
               number of subwatersheds
C
    nsubbasin
               number of stream channels (corresponds with number of subwatersheds)
  nrchid
С
   ndefid number of land groups to assign parameters ndeluid maximum number of land
              number of stream groups to assign parameters
   ndefid
C
C
C
                          nlgroup nlandp
2 96
c nsws nrch nrgroup
   12 12 2
c45 general output controls
C
С
    Standard
               Output standard model parameters
               Output snow related parameters
С
  Hydrology Output hydrology related parameters
С
    Sediment
C
               Output sediment related parameters
   GQUAL
               Output general water quality related parameters
C
             Output biochemical water quality related parameters
С
   RQUAL
            Output user specified parameters
Output landuse summary
    Custom
C
C
    Landuse
               if = 0 no output
C
С
                if = 1 average annual output
С
                if = 2 yearly output
                if = 3 monthly output
С
              Output stream summary
    Stream
                if = 0 no output
C
                if = 1 average annual output
С
                if = 2 yearly output
C
                if = 3 monthly output
С
    PointSource Output point source summary
С
                if = 0 no output
С
                if = 1 average annual output
C
                if = 2 yearly output
C
                if = 3 monthly output
    Threshold Output threshold analysis summary
C
С
                if = 0 no output
С
                if = 1 average monthly output
    SUSTAIN
               Output unit-area land timeseries for SUSTAIN external option
С
                if = 0 no output
                if = 1 timeseries output
C
С
c Standard Snow Hydrology Sediment GQUAL RQUAL Custom Landuse Stream PointSource Threshold SUSTAIN
  ______
c46 user specified output parameter list
c PRECP AIRTMP SNOTMP SNOWF RAINF PRAIN MELT SNOWE WYIELD PACK PACKF PACKW PACKI PDEPTH
COVINDX NEGHTS XLNMELT RDENPKF SKYCLEAR SNOCOV DULLNESS ALBEDO PAKTEMP DEWTMP SURS UZS LZS AGWS SURO IFWO AGWO PERO TAET PERC INFIL GWI IGWI AGWI DEP
AVDEP HRAD AVVEL SAREA VOLUME RO TAU WSSD SCRSD SOSED SOBER SSEDC LSSED LRSED LBEDDEP
LDEPSCR LROSED SQO WASHQS SCRQS SOQO
                                               POQUAL SOQUAL IOQUAL GOQUAL POQC CONC CONCOUT
CONCSQAL MATSQAL MATIN MATOUT MATOSQAL DOX DOXMIN DOXMAX DOXAV DOXX BOD BODX NO3 NO3X
```

```
TAMX
               NO2
                     NO2X
                              PO4
                                      PO4X SNH4 SNH4X SPO4 SPO4X
                                                                             PHYTO PHYTOX PHYCLA BENAL
TAM
                                                                                                                  ORN
                            ORCX NOX DIN TN TP
ORNX
        ORP
               ORPX ORC
                                                           PH ALK TIC TICX CO2 CO2X TEMP
                              0
                       0
                                                                  0 0 0 0
               0
                                   0 0
0 0
                                                           0
       1
                                                      Ω
                                                      0
       Ω
               Ω
                                                                                             Ω
                                                                                                             Ω
                                     1
              0
                     0
                              0
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0
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               0
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                                                                                                    0
       Ω
                     0
                                                                                                             0
       0
              0
                     0
                             0
                                                                                                     0
                                                                                                             0
c50 model simulation time period
С
С
     mstart model start day.
             model end day.
C
    mend
     deltm
            time step in minutes.
C
    mostart model output start day.
    moend model output end day.
С
    optlevel if = 1 general output (daily)
C
С
               if = 2 output per hour (hourly)
               if = 3 output per time interval (minute)
С
C
c mstart mend deltm mostart moend optlevel
    1/1/2010 1/6/2010 60 1/1/2010
                                                              1/6/2010 3
  ______
c60 group information
C
     subbasin subbasin id
С
    defid group parameter id number of weather stations assigned to the watershed
C
    wsti = station id
C
    wti = weighting to calculate input
c subbasin defid nwst wst1 wt1 wst2 wt2 ...
                                    1.000000
1.00
                    1 792
       6665 40
                              794
       6671
               33

    6671
    33
    1
    794
    1.000000

    6673
    33
    1
    857
    1.000000

    6674
    33
    1
    795
    1.000000

    6675
    33
    1
    795
    1.000000

    6684
    40
    1
    797
    1.000000

    6839
    33
    1
    792
    1.000000

    6850
    33
    1
    857
    1.000000

    6856
    40
    1
    794
    1.000000

    6859
    33
    1
    855
    1.000000

    6861
    40
    1
    794
    1.000000

                      1
c70 modeled land use names
С
C
     deluid
                landuse id
     deluname landuse name
    premult multiplier for precipitation
C
С
    petmult
               multiplier for potential evapotranspiration
c deluid deluname premult petmult
       1000 Road_Freeway-All-All-All 1.000000 0.300000 2000 Road_Primary-All-All-All 1.000000 0.300000
        3000 Road_Minor-All-All-1.000000 0.300000
       4000
               Dev_ResHigh-All-All 1.000000
                                                              0.300000
              Dev_ResLow-All-All-All 1.000000 0.300000 Dev_Com-All-All-All 1.000000 0.300000
       5000
       6000
              Dev_Ind-All-All-All 1.000000 0.300000

Dev_Inst-All-All-All 1.000000 0.300000

Dev_Roof-All-All-All 1.000000 0.300000
       7000
       8000
       9000
       10000 Dev_Overspray-All-All-All 1.000000 0.300000 11111 Dev_Irrigated-A-Low-Confined 1.000000 0.500000
               Dev_Irrigated-A-Low-Confined 1.000000
       11112
               Dev_Irrigated-A-Low-Unconfined 1.000000 0.500000
               Dev_Irrigated-A-Med-Confined 1.000000 0.500000
       11121
       11122 Dev_Irrigated-A-Med-Unconfined 1.000000
                                                                     0.500000
       11211
               Dev_Irrigated-B-Low-Confined 1.000000 0.500000
               Dev_Irrigated-B-Low-Unconfined 1.000000 0.500000
       11212
       11221 Dev_Irrigated-B-Med-Confined 1.000000 0.500000
       11222 Dev_Irrigated-B-Med-Unconfined 1.000000 0.500000
               Dev_Irrigated-C-Low-Confined 1.000000 0.500000
       11311
       11312 Dev_Irrigated-C-Low-Unconfined 1.000000 0.500000
       11321 Dev_Irrigated-C-Med-Confined 1.000000 0.500000
               Dev_Irrigated-C-Med-Unconfined 1.000000 0.500000
       11322
               Dev_Irrigated-D-Low-Confined 1.000000 0.500000
       11411
```

11412 Dev_Irrigated-D-Low-Unconfined 1.000000 0.500000

```
11421
              Dev_Irrigated-D-Med-Confined 1.000000
                                                           0.500000
                                               1.000000
                                                                  0.500000
       11422
              Dev_Irrigated-D-Med-Unconfined
       12111
              Dev_Pervious-A-Low-Confined 1.000000
                                                          0.500000
              Dev_Pervious-A-Low-Unconfined 1.000000
       12112
                                                           0.500000
                                          1.000000
       12121
              Dev_Pervious-A-Med-Confined
                                                           0.500000
       12122
              Dev_Pervious-A-Med-Unconfined 1.000000
                                                           0.500000
       12211
              Dev_Pervious-B-Low-Confined
                                            1.000000
                                                           0.500000
       12212
              Dev Pervious-B-Low-Unconfined 1.000000
                                                           0.500000
       12221
              Dev_Pervious-B-Med-Confined
                                           1.000000
                                                           0.500000
       12222
              Dev_Pervious-B-Med-Unconfined 1.000000
                                                           0.500000
       12311
              Dev_Pervious-C-Low-Confined
                                            1.000000
                                                           0.500000
       12312
              Dev_Pervious-C-Low-Unconfined 1.000000
                                                           0.500000
       12321
              Dev_Pervious-C-Med-Confined
                                                           0.500000
                                           1.000000
       12322
              Dev_Pervious-C-Med-Unconfined 1.000000
                                                           0.500000
       12411
              Dev Pervious-D-Low-Confined
                                           1.000000
                                                           0.500000
       12412
              Dev_Pervious-D-Low-Unconfined 1.000000
                                                           0.500000
              Dev_Pervious-D-Med-Confined
       12421
                                           1.000000
                                                           0.500000
       12422
              Dev_Pervious-D-Med-Unconfined 1.000000
                                                           0.500000
       13111
              Agriculture-A-Low-Confined
                                            1.000000
                                                           1.000000
       13112
              Agriculture-A-Low-Unconfined 1.000000
                                                           1.000000
       13121
              Agriculture-A-Med-Confined
                                            1.000000
                                                           1.000000
       13122
              Agriculture-A-Med-Unconfined 1.000000
                                                           1.000000
       13211
              Agriculture-B-Low-Confined
                                            1.000000
                                                           1.000000
       13212
              Agriculture-B-Low-Unconfined 1.000000
                                                           1.000000
       13221
              Agriculture-B-Med-Confined
                                            1.000000
                                                           1.000000
       13222
              Agriculture-B-Med-Unconfined 1.000000
                                                           1.000000
       13231
              Agriculture-B-High-Confined
                                            1.000000
                                                           1.000000
       13232
              Agriculture-B-High-Unconfined 1.000000
                                                           1.000000
       13311
              Agriculture-C-Low-Confined
                                            1.000000
                                                           1.000000
              Agriculture-C-Low-Unconfined 1.000000
       13312
                                                           1.000000
              Agriculture-C-Med-Confined
       13321
                                            1.000000
                                                           1,000000
       13322
              Agriculture-C-Med-Unconfined 1.000000
                                                           1.000000
       13331
              Agriculture-C-High-Confined
                                            1.000000
                                                           1.000000
              Agriculture-D-Low-Confined
       13411
                                            1.000000
                                                           1.000000
       13412
              Agriculture-D-Low-Unconfined 1.000000
                                                           1.000000
       13421
              Agriculture-D-Med-Confined
                                            1.000000
                                                           1.000000
       13422
              Agriculture-D-Med-Unconfined 1.000000
                                                           1.000000
              Agriculture-D-High-Confined 1.000000
       13431
                                                           1.000000
       13432
              Agriculture-D-High-Unconfined 1.000000
                                                           1.000000
       14121
              Veg_Low-A-Med-Confined 1.000000
                                                  1.000000
                                            1.000000
                                                          1.000000
       14122
              Veg_Low-A-Med-Unconfined
       14131
              Veg_Low-A-High-Confined
                                            1.000000
                                                           1.000000
              Veg_Low-A-High-Unconfined
       14132
                                            1.000000
                                                           1.000000
       14221
              Veg_Low-B-Med-Confined 1.000000
                                                 1.000000
                                            1.000000
       14222
              Veg_Low-B-Med-Unconfined
                                                           1.000000
       14231
              Veg_Low-B-High-Confined
                                            1.000000
                                                           1.000000
       14232
              Veg_Low-B-High-Unconfined
                                            1.000000
                                                           1.000000
                                                1.000000
              Veg_Low-C-Med-Confined 1.000000
       14321
       14322
              Veg_Low-C-Med-Unconfined
                                            1.000000
                                                           1.000000
                                            1.000000
       14331
              Veg_Low-C-High-Confined
                                                           1.000000
                                            1.000000
                                                          1.000000
       14332
              Veg_Low-C-High-Unconfined
                                                  1.000000
       14421
              Veg_Low-D-Med-Confined 1.000000
       14422
              Veg_Low-D-Med-Unconfined
                                            1.000000
                                                           1.000000
       14431
              Veg Low-D-High-Confined
                                            1.000000
                                                           1.000000
       14432
              Veg_Low-D-High-Unconfined
                                            1.000000
                                                           1.000000
       15121
              Veg_High-A-Med-Confined
                                            1.000000
                                                           1.000000
       15122
              Veg High-A-Med-Unconfined
                                            1.000000
                                                           1.000000
       15131
              Veg_High-A-High-Confined
                                            1.000000
                                                           1.000000
              Veg_High-A-High-Unconfined
                                            1.000000
                                                           1.000000
       15132
                                                           1.000000
       15221
              Veg_High-B-Med-Confined
                                            1.000000
       15222
              Veg High-B-Med-Unconfined
                                            1.000000
                                                           1.000000
       15231
              Veg_High-B-High-Confined
                                            1.000000
                                                           1.000000
       15232
              Veg_High-B-High-Unconfined
                                            1.000000
                                                           1.000000
       15321
              Veg_High-C-Med-Confined
                                            1.000000
                                                           1.000000
                                            1.000000
       15322
              Veg_High-C-Med-Unconfined
                                                           1.000000
       15331
              Veg_High-C-High-Confined
                                            1.000000
                                                           1.000000
              Veg_High-C-High-Unconfined
                                            1.000000
       15332
                                                           1.000000
       15421
              Veg_High-D-Med-Confined
                                            1.000000
                                                           1.000000
       15422
              Veg_High-D-Med-Unconfined
                                            1.000000
                                                           1.000000
       15431
              Veg_High-D-High-Confined
                                            1.000000
                                                           1.000000
       15432
              Veq High-D-High-Unconfined
                                            1.000000
                                                           1.000000
       16000 Water-All-All-All
                                   1.000000
                                                   1.000000
C-----
c80 land use to stream routing
    defid
                landuse default group id
                land use id
    deluid
                fraction of surface runoff that routes to the stream (0-1) (default=1)
    route_suro
                if negative (<0) value then that fraction will be lost from the system
```

C

С

С

С

С

```
route_ifwo fraction of interflow outflow that routes to the stream (0-1) (default=1)
C
                  if negative (<0) value then that fraction will be lost from the system
С
С
     route_agwo fraction of groundwater outflow that routes to the stream (0-1) (default=1)
С
                  if negative (<0) value then that fraction will be lost from the system
C
С
     Example: 0.3 means 30% of outflow routes to the stream and 70% bypasses to the next down stream in the
reach network
             -0.3 means 30% of outflow is permanently lost from the system and 70% routes to the stream
C
С
              Enter a value of -1 to permanently lose all water from the respective layer
              This convention applies to all three parameters (route_suro, route_ifwo, and route_agwo)
С
С
С
   defid deluid route_suro route_ifwo route_agwo
               1000
                       1.000000
                                       1.000000
                                                       -1.000000
        33
        33
                2000
                       1.000000
                                       1.000000
                                                       -1.000000
        33
               3000
                       1.000000
                                       1.000000
                                                       -1.000000
        33
                4000
                       1.000000
                                       1.000000
                                                       -1.00000
                                                       -1.000000
        33
                5000
                       1.000000
                                       1.000000
        33
               6000
                       1.000000
                                       1.000000
                                                       -1.000000
        33
                7000
                       1.000000
                                       1.000000
                                                       -1.000000
                                       1.000000
        33
               8000
                       1.000000
                                                       -1.000000
                9000
                                       1.000000
        33
                       1.000000
                                                       -1.000000
               10000
        33
                       1.000000
                                       1.000000
                                                       -1.000000
        33
               11111
                       1.000000
                                       1.000000
                                                       -0.900000
                                       1.000000
                                                       -0.900000
        33
               11112
                       1.000000
        33
               11121
                       1.000000
                                       1.000000
                                                       -0.900000
        33
               11122
                       1.000000
                                       1.000000
                                                       -0.900000
        33
               11211
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                                                       -0.900000
        33
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               11221
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                                                       -0.900000
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               11222
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                                                       -0.900000
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                                                       -0.900000
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        33
               12111
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                                       1.000000
                                                       -0.900000
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                                                       -0.500000
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        33
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                                       1.000000
                                                       -0.500000
                                       1.000000
        33
               13122
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                                                       -0.500000
        33
                                       1,000000
               13211
                       1.000000
                                                       -0.500000
        33
               13212
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                                                       -0.500000
        33
               13221
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                                                       -0.500000
        33
               13222
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        33
               13231
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                                       1.000000
                                                       -0.500000
        33
               13232
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                                                       -0.500000
                       1.000000
                                       1.000000
        33
               13311
                                                       -0.500000
        33
               13312
                                       1.000000
                                                       -0.500000
                       1.000000
        33
                13321
                                       1.000000
                                                       -0.500000
                       1.000000
        33
               13322
                       1.000000
                                       1,000000
                                                       -0.500000
        33
               13331
                       1.000000
                                       1.000000
                                                       -0.500000
        33
               13411
                       1.000000
                                       1.000000
                                                       -0.500000
        33
               13412
                       1.000000
                                       1.000000
                                                       -0.500000
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               13431
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               13432
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                                                       -0.500000
        33
               14121
                       1.000000
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                                                       -0.500000
        33
               14122
                       1.000000
                                       1.000000
                                                       -0.500000
        33
               14131
                       1.000000
                                       1.000000
                                                       -0.500000
        33
               14132
                       1.000000
                                       1.000000
                                                       -0.500000
```

2.2	1 4001	1 000000	1 000000	0 500000
33	14221	1.000000	1.000000	-0.500000
33	14222	1.000000	1.000000	-0.500000
33	14231	1.000000	1.000000	-0.500000
33	14232	1.000000	1.000000	-0.500000
33	14321	1.000000	1.000000	-0.500000
33	14322	1.000000	1.000000	-0.500000
33	14331	1.000000	1.000000	-0.500000
33	14332	1.000000	1.000000	-0.500000
33	14421	1.000000	1.000000	-0.500000
33	14422	1.000000	1.000000	-0.500000
33	14431	1.000000	1.000000	-0.500000
33	14432	1.000000	1.000000	-0.500000
33	15121	1.000000	1.000000	-0.500000
33	15122	1.000000	1.000000	-0.500000
33	15131	1.000000	1.000000	-0.500000
33	15132	1.000000	1.000000	-0.500000
33	15221	1.000000	1.000000	-0.500000
33	15222	1.000000	1.000000	-0.500000
33	15231	1.000000	1.000000	-0.500000
33	15232	1.000000	1.000000	-0.500000
33	15321	1.000000	1.000000	-0.500000
33	15322	1.000000	1.000000	-0.500000
33	15331	1.000000	1.000000	-0.500000
33	15332	1.000000	1.000000	-0.500000
33	15421	1.000000	1.000000	-0.500000
33	15422	1.000000	1.000000	-0.500000
33	15431	1.000000	1.000000	-0.500000
33	15432	1.000000	1.000000	-0.500000
33	16000	1.000000	1.000000	-0.500000
40	1000	-0.400000	-0.900000	-1.000000
		-0.400000	-0.900000	
40	2000			-1.000000
40	3000	-0.400000	-0.900000	-1.000000
40	4000	-0.400000	-0.900000	-1.000000
40	5000	-0.400000	-0.900000	-1.000000
40	6000	-0.400000	-0.900000	-1.000000
40	7000	-0.400000	-0.900000	-1.000000
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40	9000	-0.400000	-0.900000	-1.000000
40	10000	-0.400000	-0.900000	-1.000000
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40	11112	-0.400000	-0.900000	-0.900000
40	11121	-0.400000	-0.900000	-0.900000
40	11122	-0.400000	-0.90000	-0.900000
40	11211	-0.400000	-0.90000	-0.900000
40	11212	-0.400000	-0.900000	-0.900000
40	11221	-0.400000	-0.900000	-0.900000
40	11222	-0.400000	-0.900000	-0.900000
40	11311	-0.400000	-0.900000	-0.900000
40	11312	-0.400000	-0.900000	-0.900000
40	11321	-0.400000	-0.900000	-0.900000
40	11322	-0.400000	-0.900000	-0.900000
40	11411	-0.400000	-0.90000	-0.900000
40	11412	-0.400000	-0.900000	-0.900000
40	11421	-0.400000	-0.900000	-0.900000
40	11422	-0.400000	-0.900000	-0.900000
40	12111	-0.400000	-0.900000	-0.900000
40	12111	-0.400000	-0.900000	-0.900000
40	12121	-0.400000	-0.900000	-0.900000
40	12122	-0.400000	-0.900000	-0.900000
40	12211	-0.400000	-0.900000	-0.900000
40	12212	-0.400000	-0.900000	-0.900000
40	12221	-0.400000	-0.900000	-0.900000
40	12222	-0.400000	-0.900000	-0.900000
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	12321	-0.400000	-0.900000	-0.900000
40	12322	-0.400000	-0.900000	-0.900000
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40	12412	-0.400000	-0.900000	-0.900000
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40	13112	-0.400000	-0.500000	-0.800000
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40	13211	-0.400000	-0.500000	-0.800000
		-0.400000	-0.500000	-0.800000
40	13212			
40	13212 13221	-0.400000	-0.500000	-0.800000

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40
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              13312 -0.400000
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             15232 -0.400000
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              15322
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       40
              15432
                                                  -0.800000
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              16000
                    -0.400000
                                   -0.500000
                                                  -0.800000
c90 land use information
               subbasin id
    subbasin
               land use id
               land use name
    deluname
               1 imperivous land (subsurface processes disabled)
    perimp
               2 pervious land (subsurface processes activated)
    area_ac
               area (acres)
    slsur
               slope of overland flow plane (none)
               length of overland flow plane (feet)
    lsur
  subbasin deluid deluname perimp area_ac slsur lsur
                                             1
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             1000
                     Road_Freeway-All-All-All
                                                        0.000000
                                                                      0.010000
                                                                                     100.000000
       6665
              2000
                     Road_Primary-All-All-All
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                     Road_Minor-All-All-All 1
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       6665
                                                 1 3.402785 0.010000
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              4000
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                                                                                     100.000000
                                                 1.636626 0.010000 100.000000
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       6665
                     Dev_ResLow-All-All-All 1
                     Dev_Com-All-All-All 1
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                     Dev_Ind-All-All 1
Dev_Inst-All-All 1
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             10000 Dev_Overspray-All-All-All
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              11111
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                                                                      0.010000
                                                                                     400.000000
                                                              0.000000 0.010000
                                                                                             400.000000
       6665
              11112
                     Dev_Irrigated-A-Low-Unconfined
                                                         2
                                                         0.000000 0.010000 300.000000
       6665
             11121
                     Dev_Irrigated-A-Med-Confined 2
             11122
                                                              0.000000 0.010000
       6665
                     Dev_Irrigated-A-Med-Unconfined
                                                         2
                                                                                            300.000000
       6665
              11211
                     Dev_Irrigated-B-Low-Confined 2
                                                         0.000000 0.010000 400.000000
              11212
                                                         2 0.000000 0.010000
       6665
                     Dev Irrigated-B-Low-Unconfined
                                                                                            400.000000
                                                         0.000000 0.010000 300.000000
       6665
              11221
                     Dev_Irrigated-B-Med-Confined 2
                                                         2 0.000000 0.010000
       6665
              11222
                     Dev_Irrigated-B-Med-Unconfined
                                                                                            300.000000
              11311
                                                         0.000000 0.010000 400.000000
       6665
                     Dev_Irrigated-C-Low-Confined 2
                                                             0.000000 0.010000
       6665
              11312
                     Dev_Irrigated-C-Low-Unconfined
                                                                                            400.000000
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С

C

С

C

C

С

С С

С

С

C

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       11321
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                                                                       0.010000
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                                                               0.000000
                                                                               0.010000
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       11322
               Dev_Irrigated-C-Med-Unconfined
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        11411
               Dev_Irrigated-D-Low-Confined
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                                                                       0.010000
                                                                                        400.000000
       11412
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        11421
                Dev_Irrigated-D-Med-Confined 2
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                                                                                       300.000000
                                                               0.000000
                                                                               0.010000
                                                                                                300.000000
6665
       11422
               Dev Irrigated-D-Med-Unconfined
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               Dev_Pervious-A-Low-Confined
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               Dev Pervious-A-Low-Unconfined 2
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                                                                        0.010000
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6665
       12121
               Dev_Pervious-A-Med-Confined
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                                                                        0.010000
                                                                                        300.000000
6665
        12122
                Dev_Pervious-A-Med-Unconfined 2
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                                                                        0.010000
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       12211
6665
               Dev_Pervious-B-Low-Confined
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                                                                        0.010000
                                                                                        400.000000
        12212
6665
               Dev_Pervious-B-Low-Unconfined 2
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                                                                                        400.000000
6665
       12221
               Dev Pervious-B-Med-Confined
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                                                                        0.010000
                                                                                        300.000000
6665
       12222
               Dev_Pervious-B-Med-Unconfined 2
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6665
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6665
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                Dev_Pervious-C-Low-Unconfined 2
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                Dev_Pervious-C-Med-Confined
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               Agriculture-D-High-Confined
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                                                                                       400.000000
6665
       14121
                Veg_Low-A-Med-Confined 2
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       14122
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6665
                Veg Low-A-Med-Unconfined
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                                                0.000000
                                                               0.010000
                                                                               300.000000
6665
       14221
               Veg_Low-B-Med-Confined 2
6665
        14222
               Veg_Low-B-Med-Unconfined
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                                                                                       300.000000
       14231
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               Veg_Low-B-High-Confined
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       14232
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                Veg Low-C-Med-Confined 2
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       14322
                Veg_Low-C-Med-Unconfined
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                                                                                       300.000000
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               Veg_Low-C-High-Unconfined
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                                                                       0.010000
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       14422
               Veg Low-D-Med-Unconfined
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6665
        16000
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6671
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                Road_Freeway-All-All-All
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                                                                        0.010000
                                                                                       100.000000
6671
        2000
               Road_Primary-All-All-All
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                                                                        0.010000
                                                                                       100.000000
6671
        3000
                Road_Minor-All-All-All 1
                                               0.904067
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6671
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               Dev_Com-All-All-All
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6671
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                                       1
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6671
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6671
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               Veg Low-B-Med-Unconfined
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6673
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6673
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               Veg_Low-B-Med-Unconfined
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                Veg_Low-B-High-Confined
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                Veg_Low-B-High-Unconfined
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       14232
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                Veg_Low-C-Med-Confined 2
6673
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                Veg Low-C-Med-Unconfined
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                Veg_Low-D-Med-Confined 2
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6675
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6684
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6684
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               Dev Pervious-A-Med-Confined
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6839
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6839
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6839
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               Veg High-C-Med-Unconfined
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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6844
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                                                               0.000000
                                                                               0.010000
                                                                                               300.000000
       11311
                                                                                       400.000000
6856
               Dev Irrigated-C-Low-Confined 2
                                                       0.000000
                                                                       0.010000
6856
       11312
               Dev_Irrigated-C-Low-Unconfined
                                                       2
                                                               0.000000
                                                                               0.020000
                                                                                               400.000000
6856
       11321
                                                                       0.010000
                                                                                       300.000000
               Dev Irrigated-C-Med-Confined 2
                                                       0.000000
6856
       11322
               Dev_Irrigated-C-Med-Unconfined
                                                       2
                                                               0.000000
                                                                               0.010000
                                                                                               300.000000
6856
        11411
               Dev_Irrigated-D-Low-Confined 2
                                                       0.000000
                                                                       0.010000
                                                                                       400.000000
6856
        11412
               Dev_Irrigated-D-Low-Unconfined
                                                       2
                                                               1.994953
                                                                               0.010000
                                                                                               400.000000
6856
       11421
               Dev_Irrigated-D-Med-Confined 2
                                                       0.000000
                                                                       0.010000
                                                                                       300.000000
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6056	11400	· · · · · · · · · · · · · · · · · ·	,	0	0 000000	^	010000	200 00000
6856	11422 12111	Dev_Irrigated-D-Med-Unconfined		2	0.000000		010000	300.000000
6856		Dev_Pervious-A-Low-Confined	2	0.00000		0.010000		.000000
6856	12112	Dev_Pervious-A-Low-Unconfined		0.00000		0.010000		.000000
6856	12121	Dev_Pervious-A-Med-Confined	2	0.00000		0.010000		.000000
6856	12122	Dev_Pervious-A-Med-Unconfined		0.00000		0.010000		.000000
6856	12211	Dev_Pervious-B-Low-Confined	2	0.00000		0.010000		.000000
6856	12212	Dev_Pervious-B-Low-Unconfined		0.00000		0.040000		.000000
6856	12221	Dev_Pervious-B-Med-Confined	2	0.00000	00 (0.010000	300	.000000
6856	12222	Dev_Pervious-B-Med-Unconfined	2	0.00000	00 (0.010000	300	.000000
6856	12311	Dev_Pervious-C-Low-Confined	2	0.00000	00 (0.010000	400	.000000
6856	12312	Dev_Pervious-C-Low-Unconfined	2	0.00000	00	0.020000	400	.000000
6856	12321	Dev_Pervious-C-Med-Confined	2	0.00000	00	0.010000	300	.000000
6856	12322	Dev_Pervious-C-Med-Unconfined	2	0.00000	00	0.010000	300	.000000
6856	12411	Dev_Pervious-D-Low-Confined	2	0.00000		0.010000		.000000
6856	12412	Dev_Pervious-D-Low-Unconfined		5.68050		0.010000		.000000
6856	12421	Dev_Pervious-D-Med-Confined	2	0.00000		0.010000		.000000
6856	12422	Dev_Pervious-D-Med-Unconfined		0.00000		0.010000		.000000
6856	13111	Agriculture-A-Low-Confined	2	0.00000		0.010000		.000000
	13111	_	2					
6856		Agriculture-A-Low-Unconfined		0.00000		0.010000		.000000
6856	13121	Agriculture-A-Med-Confined	2	0.00000		0.010000		.000000
6856	13122	Agriculture-A-Med-Unconfined	2	0.00000		0.010000		.000000
6856	13211	Agriculture-B-Low-Confined	2	0.00000		0.010000		.000000
6856	13212	Agriculture-B-Low-Unconfined	2	0.00000		0.010000		.000000
6856	13221	Agriculture-B-Med-Confined	2	0.00000	00 (0.010000		.000000
6856	13222	Agriculture-B-Med-Unconfined	2	0.00000	00 (0.010000	300	.000000
6856	13231	Agriculture-B-High-Confined	2	0.00000	00 (0.010000	400	.000000
6856	13232	Agriculture-B-High-Unconfined	2	0.00000	0 (0.010000	400	.000000
6856	13311	Agriculture-C-Low-Confined	2	0.00000	00	0.010000	400	.000000
6856	13312	Agriculture-C-Low-Unconfined	2	0.00000	00	0.010000	400	.000000
6856	13321	Agriculture-C-Med-Confined	2	0.00000	0 (0.010000	300	.000000
6856	13322	Agriculture-C-Med-Unconfined	2	0.00000		0.010000		.000000
6856	13331	Agriculture-C-High-Confined	2	0.00000		0.010000		.000000
6856	13411	Agriculture-D-Low-Confined	2	0.00000		0.010000		.000000
6856	13412	Agriculture-D-Low-Unconfined	2	0.00000		0.010000		.000000
6856	13421	Agriculture-D-Med-Confined	2	0.00000		0.010000		.000000
6856	13421	-	2	0.00000		0.010000		
		Agriculture-D-Med-Unconfined						.000000
6856	13431	Agriculture-D-High-Confined	2	0.00000		0.010000		.000000
6856	13432	Agriculture-D-High-Unconfined		0.00000		0.010000		.000000
6856	14121	Veg_Low-A-Med-Confined 2		000000	0.010000		0.000000	
6856	14122	Veg_Low-A-Med-Unconfined	2	0.00000		0.010000		.000000
6856	14131	Veg_Low-A-High-Confined	2	0.00000		0.010000		.000000
6856	14132	Veg_Low-A-High-Unconfined	2	0.00000		0.010000		.000000
6856	14221	Veg_Low-B-Med-Confined 2		000000	0.010000		0.000000	
6856	14222	Veg_Low-B-Med-Unconfined	2	0.00000		0.020000		.000000
6856	14231	Veg_Low-B-High-Confined	2	0.00000	00	0.010000	400	.000000
6856	14232	Veg_Low-B-High-Unconfined	2	0.00000	00 (0.010000	400	.000000
6856	14321	Veg_Low-C-Med-Confined 2	0.	000000	0.010000	30	0.000000	
6856	14322	Veg_Low-C-Med-Unconfined	2	0.00000	00	0.020000	300	.000000
6856	14331	Veg_Low-C-High-Confined	2	0.00000	00	0.010000	400	.000000
6856	14332	Veg_Low-C-High-Unconfined	2	0.00000	00	0.010000	400	.000000
6856	14421	Veg Low-D-Med-Confined 2		000000	0.010000		0.000000	
6856	14422	Veg_Low-D-Med-Unconfined	2	12.4476		0.010000		.000000
6856	14431	Veg_Low-D-High-Confined	2	0.00000		0.010000		.000000
6856	14432	Veg_Low-D-High-Unconfined	2	0.00000		0.010000		.000000
6856	15121	Veg_High-A-Med-Confined	2	0.00000		0.010000		.000000
6856	15121	Veg_High-A-Med-Unconfined	2	0.00000		0.010000		.000000
6856	15131	Veg_High-A-High-Confined	2	0.00000		0.010000		.000000
6856	15131	Veg_High-A-High-Unconfined	2	0.00000		0.010000		.000000
6856	15221	Veg_High-B-Med-Confined	2	0.00000		0.010000		.000000
6856	15222	Veg_High-B-Med-Unconfined	2	0.00000		0.020000		.000000
6856	15231	Veg_High-B-High-Confined	2	0.00000		0.010000		.000000
6856	15232	Veg_High-B-High-Unconfined	2	0.00000		0.010000		.000000
6856	15321	Veg_High-C-Med-Confined	2	0.00000		0.010000		.000000
6856	15322	Veg_High-C-Med-Unconfined	2	0.00000	00 (0.010000	300	.000000
6856	15331	Veg_High-C-High-Confined	2	0.00000	00 (0.010000	400	.000000
6856	15332	Veg_High-C-High-Unconfined	2	0.00000	00 (0.010000	400	.000000
6856	15421	Veg_High-D-Med-Confined	2	0.00000	00 (0.010000	300	.000000
6856	15422	Veg_High-D-Med-Unconfined	2	18.6468		0.010000		.000000
6856	15431	Veg_High-D-High-Confined	2	0.00000		0.010000		.000000
6856	15432	Veg_High-D-High-Unconfined	2	0.00000		0.010000		.000000
6856	16000	Water-All-All 1		000000	0.010000		0.000000	
6859	1000	Road_Freeway-All-All-All	1	0.00000		0.010000		.000000
6859	2000	Road_Primary-All-All-All	1	21.0088		0.020000		.000000
6859	3000	Road_Minor-All-All-All 1		7.359338	0.010000		0.000000	
6859	4000	Dev_ResHigh-All-All-All	1	27.0221		0.010000		.000000
6859	5000	Dev_ResLow-All-All-All 1		27.0221 396450	0.020000		0.00000.00	
6859	6000	Dev_Com-All-All 1			0.020000			
				3.203617 976501			0.000000	
6859	7000	Dev_Ind-All-All 1 Dev Inst-All-All-All 1		876501	0.010000		0.000000	
6859	8000	Dev_Inst-All-All 1	5/	1.128734	0.020000	10	0.000000	

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6859
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               Dev Roof-All-All 1
                                               200.677088
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                                                                               100.000000
       10000
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6859
               Dev_Overspray-All-All-All
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6859
        11111
               Dev_Irrigated-A-Low-Confined
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       11112
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6859
               Dev_Irrigated-A-Low-Unconfined
                                                        2
6859
        11121
                Dev_Irrigated-A-Med-Confined 2
                                                        0.000000
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                                                                                       300.000000
       11122
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6859
               Dev Irrigated-A-Med-Unconfined
                                                        2
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6859
        11211
                                                        0.000000
               Dev Irrigated-B-Low-Confined
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6859
       11212
               Dev Irrigated-B-Low-Unconfined
                                                        2
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6859
       11221
               Dev_Irrigated-B-Med-Confined 2
                                                        0.000000
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6859
        11222
                Dev_Irrigated-B-Med-Unconfined
                                                        2
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6859
       11311
               Dev_Irrigated-C-Low-Confined 2
                                                        0.000000
                                                                       0.010000
                                                                                       400.000000
        11312
6859
                Dev_Irrigated-C-Low-Unconfined
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6859
       11321
               Dev Irrigated-C-Med-Confined 2
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6859
        11322
               Dev_Irrigated-C-Med-Unconfined
                                                        2
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       11411
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6859
               Dev Irrigated-D-Low-Confined 2
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                                                                               0.010000
6859
        11412
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                                                               17.620890
                                                                                                400.000000
                Dev_Irrigated-D-Med-Confined 2
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6859
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       11422
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6859
               Dev_Irrigated-D-Med-Unconfined
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                Dev_Pervious-A-Low-Confined
                                                        0.000000
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6859
       12112
               Dev_Pervious-A-Low-Unconfined 2
                                                        0.000000
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6859
        12121
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               Dev_Pervious-A-Med-Confined
       12122
6859
               Dev_Pervious-A-Med-Unconfined 2
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6859
       12211
               Dev_Pervious-B-Low-Confined
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6859
        12212
                Dev_Pervious-B-Low-Unconfined 2
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6859
       12221
               Dev_Pervious-B-Med-Confined
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6859
       12222
               Dev_Pervious-B-Med-Unconfined 2
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       12311
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6859
               Dev_Pervious-C-Low-Confined
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6859
        12312
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               Dev_Pervious-C-Low-Unconfined
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       12321
6859
               Dev Pervious-C-Med-Confined
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6859
       12322
                Dev_Pervious-C-Med-Unconfined 2
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6859
       12411
                Dev Pervious-D-Low-Confined
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                                                                                        400.000000
6859
       12412
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6859
       12421
                Dev_Pervious-D-Med-Confined
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       12422
               Dev_Pervious-D-Med-Unconfined 2
6859
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        13111
6859
                Agriculture-A-Low-Confined
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       13112
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6859
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               Agriculture-A-Low-Unconfined
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6859
       13121
                Agriculture-A-Med-Confined
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6859
       13122
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               Agriculture-A-Med-Unconfined
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6859
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               Agriculture-B-Low-Confined
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6859
        13212
               Agriculture-B-Low-Unconfined
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       13221
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6859
               Agriculture-B-Med-Confined
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6859
        13222
               Agriculture-B-Med-Unconfined
                                               2
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6859
       13231
               Agriculture-B-High-Confined
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               Agriculture-B-High-Unconfined
6859
        13232
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       13311
6859
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6859
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6859
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6859
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               Agriculture-C-Med-Unconfined
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6859
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               Agriculture-C-High-Confined
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       13411
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6859
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               Agriculture-D-Low-Confined
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6859
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                Agriculture-D-Low-Unconfined
6859
        13421
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               Agriculture-D-Med-Confined
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6859
        13422
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6859
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6859
       13432
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6859
        14121
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6859
       14122
               Veg Low-A-Med-Unconfined
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6859
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                Veg_Low-B-Med-Confined 2
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6859
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                Veg Low-B-Med-Unconfined
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6859
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                Veg_Low-C-Med-Confined 2
6859
       14322
                Veg_Low-C-Med-Unconfined
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                                                2
6859
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                Veg Low-C-High-Confined
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6859
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6859
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6859
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6859
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                Veg_High-A-Med-Confined
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6859
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                Veg High-A-Med-Unconfined
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6859
       15131
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                                                                                        400.000000
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                Vea High-A-High-Unconfined
                                                        0.000000
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6859
       15221
                Veg_High-B-Med-Confined
                                               2
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6859
        15222
                Veg_High-B-Med-Unconfined
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                Veg_High-B-High-Confined
                                                        0.000000
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                                                                                        400.000000
6859
       15232
               Veg_High-B-High-Unconfined
                                                        0.00000
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6859
       15321
               Veg_High-C-Med-Confined
                                               2
                                                       0.000000
                                                                       0.010000
                                                                                       300.000000
6859
       15322
               Veg_High-C-Med-Unconfined
                                               2
                                                       0.000000
                                                                       0.010000
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                                               2
6859
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               Veg_High-C-High-Confined
                                                       0.000000
                                                                       0.010000
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               Veg_High-C-High-Unconfined
       15332
                                               2
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6859
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                                                                       0.010000
6859
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6859
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6859
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6859
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               Veg_High-D-High-Unconfined
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6859
       16000
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6861
        1000
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                                                                       0.010000
                                                                                       100.000000
        2000
6861
               Road_Primary-All-All-All
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        3000
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6861
                Road_Minor-All-All-All 1
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6861
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               Dev_ResHigh-All-All-All
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                                                                       0.010000
                                                                                       100.000000
6861
        5000
               Dev_ResLow-All-All-All 1
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6861
               Dev Com-All-All-All
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               Dev_Ind-All-All-All
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                Dev_Inst-All-All-All
6861
        8000
                                               12.023423
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        9000
                                               91.156744
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6861
               Dev_Roof-All-All-All
6861
        10000
                Dev_Overspray-All-All-All
                                                       1.737169
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6861
       11111
               Dev Irrigated-A-Low-Confined
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               Dev_Irrigated-A-Low-Unconfined
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       11121
               Dev_Irrigated-A-Med-Confined 2
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               Dev_Irrigated-A-Med-Unconfined
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                Dev_Irrigated-B-Low-Confined 2
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               Dev_Irrigated-C-Low-Confined 2
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               Dev Irrigated-D-Med-Confined 2
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               Dev_Irrigated-D-Med-Unconfined
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               Dev_Pervious-A-Low-Confined
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                Dev_Pervious-A-Low-Unconfined 2
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               Dev_Pervious-B-Low-Confined
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               Dev_Pervious-B-Med-Unconfined 2
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               Dev_Pervious-D-Low-Confined
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               Agriculture-C-Med-Confined
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       13421
               Agriculture-D-Med-Confined
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                Agriculture-D-Med-Unconfined
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               Agriculture-D-High-Confined
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                Veg Low-A-Med-Confined 2
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6861
                Veg Low-A-High-Confined
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                Veg_Low-B-Med-Confined 2
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6861
       14231
               Veg_Low-B-High-Confined
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14321 Veg_Low-C-Med-Confined 2 0.000000 0.010000 300.000000
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                            Veg_Low-C-Med-Unconfined
                  14331 Veg_Low-C-High-Confined
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                  14332 Veg_Low-C-High-Unconfined
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                  15132 Veg_High-A-High-Unconfined
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                            Veg_High-B-Med-Confined
                15222 Veg_High-B-Med-Unconfined
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         6861 15231 Veg_High-B-High-Confined
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                15321 Veg_High-C-Med-Confined
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                15322 Veg_High-C-Med-Unconfined
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         6861 15331
                           Veg High-C-High-Confined
                            Veg_High-C-High-Unconfined
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                15421 Veg_High-D-Med-Confined
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         6861 15422 Veg_High-D-Med-Unconfined
                  15431 Veg_High-D-High-Confined
15432 Veg_High-D-High-Unconfined

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         6861 16000 Water-All-All 1 0.000000 0.010000 100.000000
c92 SNOW-FLAGS
c defid
             parameter group id
c deluid
              landuse id
c iceflag 0 = Ice formation in the snow pack is not simulated
              1 = Ice formation is simulated
c forest 0.0 - 1.0 Fraction of LAND covered by Forest (winter transpiration)
             parameter that adjusts for the effect of ice (in the snow pack) on infiltration when iceflag is 1
c fzg
(/in.)
c fzal
             lower limit of inffac as adjusted by ice in the snow pack when iceflag is 1
c defid deluid iceflag forest fzg fzgl
C-----
c93 snow-parm
c defid
             parameter group id
c deluid landuse id
c lat latitude of the pervious land segment (PLS) - ENERGY BALANCE METHOD ONLY (degree)
             positive for the northern hemisphere, negative for southern
c melev
           mean elevation of LAND above sea level - ENERGY BALANCE METHOD ONLY (ft)
c shade
            fraction of LAND shaded from solar radiation (i.e. by trees) - ENERGY BALANCE METHOD ONLY
c snowcf
            precipitation-to-snow multiplier (accounts for poor gage-catch efficiency during snow)
c covind maximum snowpack (water equivalent) at which the entire LAND is covered with snow (in)
c defid deluid lat melev shade snowcf covind
c-----
c94 snow-parm2
c defid
             parameter group id
            landuse id
c deluid
c rdcsn density of cold, new snow relative to water (For snow falling at temps below freezing.
            at higher temperatures the density of snow is adjusted)
c tsnow
            air temperature below which precipitation will be snow, under saturated conditions (deg F)
             under non-saturated conditions the temperature is adjusted slightly.
c snoevp
            adapts sublimation equation to field conditions - ENERGY BALANCE METHOD ONLY
c ccfact
             adapts snow condensation/convection melt equation to field conditions - ENERGY BALANCE METHOD ONLY
             maximum water content of the snow pack, in depth of water per depth of water.
c mwater
c mgmelt maximum rate of snowmelt by ground heat, in depth of water per day (in/day)
             this is the value which applies when the pack temperature is at the freezing point.
c defid deluid rdcsn
                                  tsnow snoevp ccfact mwater mgmelt
C------
c96 snow-init
                parameter group id
                  landuse id initial quantity of snow in the pack (water equivalent).
   deluid
    pack-snow
   pack-ice initial quantity of ice in the pack (water equivalent).
   pack-watr initial quantity of liquid water in the pack.
    rdenpf density of the frozen contents (snow and ice) of the pack, relative to water.

dull index of the dullness of the snow pack surface, from which albedo is estimated - ENERGY BALANCE
METHOD ONLY
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0.000000

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C

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14232 Veg Low-B-High-Unconfined

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mean temperature of the frozen contents of the snow pack.
   paktmp
C
              current snow pack depth (water equivalent) required to obtain complete areal coverage of LAND.
  covinx
С
               if the pack is less than this amount, areal coverage is prorated (PACKF/COVINX).
С
   xlnmlt
               current remaining possible increment to ice storage in the pack.
               relevant when Ice formation is simulated (iceflag = 1)
C
С
    skyclr
               fraction of sky which is assumed to be clear at the present time.
С
c defid deluid pack-snow pack-ice pack-watr rdenpf dull paktmp covinx xlnmlt skyclr
c100 pwat-parm1
     pervious and impervious land hydrology control
C
C
    (value of 0 = use constant pwat-parm4; 1 = use corresponding monthly variable card)
C
            interception storage capacity (card 150
C
   vcsfa
                                               (card 150)
C
  vuzfg upper zone nominal storage
   vnnfg manning's n for the overland flow plane (card 170) vifwfg interflow inflow parameter (card 180) vircfg interflow recession constant (card 190)
C
C
C
    vlefg lower zone evapotranspiration (e-t) parameter (card 200)
С
c vcsfg vuzfg vnnfg vifwfg vircfg vlefg
     0 0 0 0 0
C-----
c110 pwat-parm2
C
C
    defid parameter group id
     deluid landuse id
С
            lower zone nominal soil moisture storage (inches)
С
    lzsn
   infilt infiltration capacity of the soil (in/hr)
    kvary variable groundwater recession (1/inches)
agwrc base groundwater recession (none)
С
                        infilt
                                   kvary
c defid deluid lzsn
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33	13222	7.000000	0.400000	0.000000	0.920000
33	13231	7.000000	0.400000	0.000000	0.920000
33	13232	7.00000	0.400000	0.00000	0.920000
33	13311	7.000000	0.200000	0.000000	0.920000
33	13312	7.000000	0.200000	0.00000	0.920000
33	13321	7.000000	0.200000	0.000000	0.920000
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33	13411	7.00000	0.100000	0.000000	0.920000
33	13412	7.000000	0.100000	0.000000	0.920000
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33	13432	7.000000	0.100000	0.000000	0.920000
33	14121	8.500000	0.600000	0.000000	0.980000
33	14122	8.500000	0.600000	0.00000	0.980000
33	14131	8.500000	0.600000	0.000000	0.980000
33	14132	8.500000	0.600000	0.00000	0.980000
33	14221	8.500000	0.300000	0.000000	0.980000
33	14222	8.500000	0.300000	0.000000	0.980000
33	14231	8.500000	0.300000	0.000000	0.980000
33	14232	8.500000	0.300000	0.000000	0.980000
33	14321	8.500000	0.120000	0.000000	0.980000
33	14322	8.500000	0.120000	0.000000	0.980000
33	14331	8.500000	0.120000	0.000000	0.980000
33	14332	8.500000	0.120000	0.000000	0.980000
33	14421	8.500000	0.040000	0.000000	0.980000
33	14422	8.500000	0.040000	0.000000	0.980000
33	14431	8.500000	0.040000	0.000000	0.980000
33	14432	8.500000	0.040000	0.00000	0.980000
33	15121	8.500000	0.600000	0.000000	0.980000
33	15122	8.500000	0.600000	0.000000	0.980000
33	15131	8.500000	0.600000	0.000000	0.980000
33	15132	8.500000	0.600000	0.000000	0.980000
33	15221	8.500000	0.300000	0.000000	0.980000
33	15222	8.500000	0.300000	0.000000	0.980000
33	15231	8.500000	0.300000	0.000000	0.980000
33	15232	8.500000	0.300000	0.000000	0.980000
33	15321	8.500000	0.120000	0.000000	0.980000
33	15322	8.500000	0.120000	0.000000	0.980000
33	15331	8.500000	0.120000	0.000000	0.980000
33	15332	8.500000	0.120000	0.000000	0.980000
33	15421	8.500000	0.040000	0.000000	0.980000
33	15422	8.500000	0.040000	0.000000	0.980000
33	15431	8.500000	0.040000	0.000000	0.980000
33	15432	8.500000	0.040000	0.000000	0.980000
33	16000	0.000000	0.000000	0.000000	0.000000
40	1000	0.000000	0.000000	0.00000	0.000000
40	2000	0.000000	0.000000	0.000000	0.000000
40	3000	0.00000	0.000000	0.00000	0.000000
40	4000	0.000000	0.000000	0.000000	0.000000
40	5000	0.000000	0.000000	0.000000	0.000000
40	6000	0.000000	0.000000	0.000000	0.000000
40	7000	0.000000	0.000000	0.000000	0.000000
40	8000	0.000000	0.000000	0.000000	0.000000
40	9000	0.000000	0.000000	0.000000	0.000000
40	10000	0.000000	0.000000	0.000000	0.000000
40	11111	7.000000	0.400000	0.000000	0.920000
40	11112	7.000000	0.400000	0.000000	0.920000
40	11121	7.000000	0.400000	0.000000	0.920000
40	11122	7.000000	0.400000	0.000000	0.920000
40	11211	7.000000	0.200000	0.000000	0.920000
40	11212	7.000000	0.200000	0.000000	0.920000
40	11221	7.000000	0.200000	0.000000	0.920000
40	11222	7.000000	0.200000	0.000000	0.920000
40	11311	7.00000	0.080000	0.000000	0.920000
40	11312	7.000000	0.080000	0.000000	0.920000
40	11321	7.000000	0.080000	0.000000	0.920000
40	11322	7.000000	0.080000	0.00000	0.920000
40	11411	7.000000	0.040000	0.000000	0.920000
40	11412	7.000000	0.040000	0.000000	0.920000
40	11421	7.000000	0.040000	0.000000	0.920000
40	11421	7.000000	0.040000	0.000000	0.920000
40	12111	7.000000	0.400000	0.000000	0.920000
40	12112	7.000000	0.400000	0.00000	0.920000

4.0	10101	7 000000	0 400000	0 000000	0 000000
40	12121	7.000000	0.40000	0.000000	0.920000
40	12122	7.000000	0.400000	0.000000	0.920000
40	12211	7.000000	0.200000	0.000000	0.920000
40					
	12212	7.000000	0.200000	0.000000	0.920000
40	12221	7.000000	0.200000	0.000000	0.920000
40	12222	7.000000	0.200000	0.000000	0.920000
					0.920000
40	12311	7.000000	0.080000	0.00000	
40	12312	7.000000	0.080000	0.000000	0.920000
40	12321	7.000000	0.080000	0.000000	0.920000
40	12322	7.000000	0.080000	0.000000	0.920000
40	12411	7.000000	0.040000	0.000000	0.920000
40	12412	7.000000	0.040000	0.000000	0.920000
40	12421	7.000000	0.040000	0.00000	0.920000
40	12422	7.000000	0.040000	0.000000	0.920000
40	13111	7.000000	0.800000	0.00000	0.920000
40	13112	7.000000	0.800000	0.000000	0.920000
40	13121	7.000000	0.800000	0.00000	0.920000
40	13122	7.000000	0.800000	0.000000	0.920000
40	13211	7.000000	0.400000	0.000000	0.920000
40	13212	7.000000	0.400000	0.000000	0.920000
40	13221	7.000000	0.400000	0.000000	0.920000
40	13222	7.000000	0.40000	0.00000	0.920000
40	13231	7.000000	0.400000	0.000000	0.920000
40	13232	7.000000	0.40000	0.000000	0.920000
40	13311	7.000000	0.200000	0.000000	0.920000
40	13312	7.000000	0.200000	0.000000	0.920000
40	13321	7.000000	0.200000	0.000000	0.920000
40	13322	7.000000	0.200000	0.000000	0.920000
40	13331	7.000000	0.200000	0.00000	0.920000
40	13411	7.000000	0.100000	0.000000	0.920000
		7.000000			0.920000
40	13412		0.100000	0.00000	
40	13421	7.000000	0.100000	0.000000	0.920000
40	13422	7.000000	0.100000	0.000000	0.920000
40	13431	7.000000	0.100000	0.00000	0.920000
40	13432	7.000000	0.100000	0.000000	0.920000
40	14121	8.500000	0.600000	0.00000	0.980000
40	14122	8.500000	0.600000	0.000000	0.980000
40				0.000000	0.980000
	14131	8.500000	0.600000		
40	14132	8.500000	0.600000	0.000000	0.980000
40	14221	8.500000	0.300000	0.00000	0.980000
40	14222	8.500000	0.300000	0.000000	0.980000
40	14231	8.500000	0.300000	0.00000	0.980000
40	14232	8.500000	0.300000	0.000000	0.980000
40	14321	8.500000	0.120000	0.000000	0.980000
40	14322	8.500000	0.120000	0.00000	0.980000
40	14331	8.500000	0.120000	0.000000	0.980000
40	14332	8.500000	0.120000	0.000000	0.980000
40	14421	8.500000	0.040000	0.000000	0.980000
40	14422	8.500000	0.040000	0.000000	0.980000
40	14431	8.500000	0.040000	0.000000	0.980000
40	14432	8.500000	0.040000	0.00000	0.980000
40	15121	8.500000	0.600000	0.000000	0.980000
40	15122	8.500000	0.600000	0.000000	0.980000
40	15131	8.500000	0.600000	0.000000	0.980000
40	15132	8.500000	0.600000	0.000000	0.980000
40	15221	8.500000	0.300000	0.000000	0.980000
40	15222	8.500000	0.300000	0.00000	0.980000
4.0	1 [2 2 1	8.500000	0.300000	0.000000	0.980000
40	15231		0.300000	0.000000	0.980000
		8.500000			
40	15232	8.500000		0 000000	0 980000
40 40	15232 15321	8.500000	0.120000	0.000000	0.980000
40 40 40	15232 15321 15322	8.500000 8.500000	0.120000 0.120000	0.000000	0.980000
40 40	15232 15321	8.500000	0.120000		
40 40 40 40	15232 15321 15322 15331	8.500000 8.500000 8.500000	0.120000 0.120000 0.120000	0.000000 0.000000	0.980000 0.980000
40 40 40 40	15232 15321 15322 15331 15332	8.500000 8.500000 8.500000 8.500000	0.120000 0.120000 0.120000 0.120000	0.00000 0.00000 0.00000	0.980000 0.980000 0.980000
40 40 40 40 40	15232 15321 15322 15331 15332 15421	8.500000 8.500000 8.500000 8.500000	0.120000 0.120000 0.120000 0.120000 0.040000	0.00000 0.000000 0.000000 0.000000	0.980000 0.980000 0.980000 0.980000
40 40 40 40 40 40	15232 15321 15322 15331 15332 15421 15422	8.500000 8.500000 8.500000 8.500000 8.500000	0.120000 0.120000 0.120000 0.120000 0.040000 0.040000	0.00000 0.000000 0.000000 0.000000	0.980000 0.980000 0.980000 0.980000
40 40 40 40 40	15232 15321 15322 15331 15332 15421	8.500000 8.500000 8.500000 8.500000	0.120000 0.120000 0.120000 0.120000 0.040000	0.00000 0.000000 0.000000 0.000000	0.980000 0.980000 0.980000 0.980000
40 40 40 40 40 40 40	15232 15321 15322 15331 15332 15421 15422 15431	8.500000 8.500000 8.500000 8.500000 8.500000 8.500000	0.120000 0.120000 0.120000 0.120000 0.040000 0.040000 0.040000	0.000000 0.000000 0.000000 0.000000 0.000000	0.980000 0.980000 0.980000 0.980000 0.980000
40 40 40 40 40 40 40 40	15232 15321 15322 15331 15332 15421 15422 15431 15432	8.500000 8.500000 8.500000 8.500000 8.500000 8.500000 8.500000	0.120000 0.120000 0.120000 0.120000 0.040000 0.040000 0.040000	0.000000 0.000000 0.000000 0.000000 0.000000	0.980000 0.980000 0.980000 0.980000 0.980000 0.980000
40 40 40 40 40 40 40	15232 15321 15322 15331 15332 15421 15422 15431	8.500000 8.500000 8.500000 8.500000 8.500000 8.500000	0.120000 0.120000 0.120000 0.120000 0.040000 0.040000 0.040000	0.000000 0.000000 0.000000 0.000000 0.000000	0.980000 0.980000 0.980000 0.980000 0.980000

agwetp fraction of remaining potential e-t that can be satisfied from active groundwater (none)

С

c agweetp fraction	or remaining p	ocencial e-c	chac can be saci	siled IIOM acci	ve groundwater	(Hone)
c defid deluid petma 33 1000	ex petmin 45.000000	infexp 35.000000	infild deep 0.000000	fr basetp 0.000000	agwetp 0.000000	0.000000
0.000000 33 2000 0.000000	45.000000	35.000000	0.00000	0.000000	0.000000	0.000000
33 3000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 33 4000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 33 5000	45.000000	35.000000	0.00000	0.000000	0.000000	0.000000
0.000000 33 6000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 33 7000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 33 8000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 33 9000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 33 10000	45.000000	35.000000	0.00000	0.000000	0.000000	0.000000
0.000000 33 11111	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 11112	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 11121	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 11122	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 11211	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 11212	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 11221	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 11222	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 11311	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 11312	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 11321	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 11322	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 11411	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 11412	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 11421	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 11422	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12111	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12112	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12121	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12122	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12211	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12212	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12221	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12222	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12311	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12312	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 12321	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 12322 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.00000						

33 12411 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 12412 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
33 12421 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
33 12422	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13111	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13112	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13121	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13122	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13211	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13212	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13221	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13222	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13231	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13232	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13311	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13312	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13321	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13322	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13331	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13411	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13412	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13421	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13422	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 13431	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 33 13432	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 33 14121	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14122	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14131	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14132	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14221	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14222	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14231	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14232	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14321	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14322	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14331	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14332	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 14421	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 14422	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000						

33 14431 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
33 14432 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
33 15121 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
33 15122	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 15131	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 15132	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 15221	45.000000	35.000000	2.000000	2.000000	0.00000	0.010000
0.030000 33 15222	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 15231	45.000000	35.000000	2.000000	2.000000	0.00000	0.010000
0.030000 33 15232	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 15321	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 15322	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 33 15331	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 33 15332						0.010000
0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	
33 15421 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
33 15422 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
33 15431 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
33 15432 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
33 16000 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
40 1000 0.000000	45.000000	35.000000	0.000000	0.000000	0.00000	0.000000
40 2000 0.000000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
40 3000 0.000000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
40 4000 0.000000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
40 5000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 40 6000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 40 7000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 40 8000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 40 9000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 40 10000	45.000000	35.000000	0.000000	0.000000	0.000000	0.000000
0.000000 40 11111	45.000000	35.000000	2.000000	2.000000	0.00000	0.000000
0.000000 40 11112	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 11121	45.000000	35.000000	2.000000	2.000000	0.00000	0.000000
0.000000 40 11122	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 11211	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 11212	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 11221	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000						0.000000
40 11222 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	
40 11311 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 11312 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000

40 11321 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.00000
40 11322 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 11411 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 11412 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.00000
40 11421	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 11422	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 12111	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 12112	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 12121	45.000000	35.000000	2.000000	2.000000	0.00000	0.000000
0.000000 40 12122	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 12211	45.000000	35.000000	2.000000	2.000000	0.00000	0.000000
0.000000 40 12212	45.000000	35.000000	2.000000	2.00000	0.300000	0.000000
0.000000 40 12221	45.000000	35.000000	2.000000	2.000000	0.00000	0.000000
0.000000 40 12222	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 12311	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000 40 12312	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 12321	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
0.000000						
40 12322 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 12411 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 12412 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 12421 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 12422 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 13111 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 13112 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 13121 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 13122 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 13211 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 13212 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
40 13221 0.000000	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
40 13222 0.000000	45.000000	35.000000	2.000000	2.000000	0.300000	0.00000
40 13231	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
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0.000000 40 13412	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000	-					

40 13421	45.000000	35.000000	2.000000	2.000000	0.000000	0.000000
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0.000000 40 13432	45.000000	35.000000	2.000000	2.000000	0.300000	0.000000
0.000000 40 14121	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14122	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14131	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14132	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14221	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
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0.030000 40 14231	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14232	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14321	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14322	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14331	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14332	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14421	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14422	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 14431	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 14432	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
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0.030000 40 15132	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15221	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15222	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15231	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15232	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 15321	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15322 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
40 15331	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
0.030000 40 15332 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
40 15421 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
40 15422 0.030000	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
40 15431 0.030000	45.000000	35.000000	2.000000	2.000000	0.000000	0.010000
40 15432	45.000000	35.000000	2.000000	2.000000	0.300000	0.010000
0.030000 40 16000 0.030000	45.000000	35.000000	2.000000	2.000000	0.00000	0.010000

c130 pwat-parm4

C

defid parameter group id deluid landuse id C

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uzsn
              upper zone nominal storage (inches)
С
С
     nsur
              Manning's n for the assumed overland flow plane (none)
С
     intfw
              interflow inflow parameter (none)
              interflow recession parameter (none)
С
     irc
С
     lzetp
              lower zone e-t parameter (none)
С
 defid deluid
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interception storage capacity (inches)

C

cepsc

33	14321	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
33	14322	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
33	14331	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	14332	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	14421	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
33	14422	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
33	14431	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	14432	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
33	15121	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15122	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33							
	15131	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15132	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15221	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15222	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15231	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15232	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15321	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15322	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15331	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15332	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15421	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15422	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
33	15431	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	15432	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
33	16000	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
40	1000	0.040000	0.00000	0.011000	0.000000	0.000000	0.000000
40	2000	0.040000	0.000000	0.011000	0.00000	0.000000	0.000000
40	3000	0.040000	0.00000	0.011000	0.00000	0.00000	0.000000
40	4000	0.040000	0.00000	0.011000	0.000000	0.000000	0.000000
						0.000000	0.000000
40	5000	0.040000	0.000000	0.011000	0.00000		
40	6000	0.040000	0.00000	0.011000	0.00000	0.00000	0.000000
40	7000	0.040000	0.00000	0.011000	0.000000	0.000000	0.000000
40							
	8000	0.040000	0.00000	0.011000	0.00000	0.00000	0.000000
40	9000	0.020000	0.00000	0.011000	0.00000	0.000000	0.000000
40	10000	0.040000	0.00000	0.011000	0.00000	0.000000	0.000000
40	11111	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	11112	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11121	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11122	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11211	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11212	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11221	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11222	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11311	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11312	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11321	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11322	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11411	0.060000	0.70000	0.200000	0.500000	0.300000	0.200000
40	11412	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	11421	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	11422	0.060000	0.560000	0.200000	0.500000	0.30000	0.200000
40	12111	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	12112	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	12121	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12122	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12211	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
	12212	0.060000			0.500000		
40			0.70000	0.200000		0.300000	0.200000
40	12221	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12222	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12311	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	12312	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	12321	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12322	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
		0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	12411						
40	12412	0.060000	0.700000	0.200000	0.500000	0.300000	0.200000
40	12421	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	12422	0.060000	0.560000	0.200000	0.500000	0.300000	0.200000
40	13111	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13112	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13121	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13122	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13211	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13212	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13221	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13222	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13231	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
40	13232	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
40	13311	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13312	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000

40	13321	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13322	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13331	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
40	13411	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13412	0.100000	0.70000	0.200000	1.000000	0.300000	0.500000
40	13421	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13422	0.100000	0.560000	0.200000	1.000000	0.300000	0.500000
40	13431	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
40	13432	0.100000	0.420000	0.200000	1.000000	0.300000	0.500000
40	14121	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14122	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14131	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14132	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14221	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14222	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14231	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14232	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14321	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14322	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14331	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14332	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14421	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14422	0.130000	0.850000	0.200000	1.000000	0.300000	0.700000
40	14431	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	14432	0.100000	0.680000	0.200000	1.000000	0.300000	0.700000
40	15121	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15122	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15131	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15132	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15221	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15222	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15231	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15232	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15321	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15322	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15331	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15332	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15421	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15422	0.150000	0.850000	0.250000	1.000000	0.300000	0.700000
40	15431	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	15432	0.130000	0.680000	0.250000	1.000000	0.300000	0.700000
40	16000	0.000000	0.000000	0.000000	0.000000	0.00000	0.000000

```
c140 pwat-state1
c initial conditions for the simulation
C
c defid parameter group id
c deluid landuse id
   ceps initial interception storage.
surs initial surface (overland flow) storage.
С
C
           initial upper zone storage.
           initial interflow storage.
   ifws
lzs
С
            initial lower zone storage.
           initial active groundwater storage.
С
    agws
           initial index to groundwater slope
    qwvs
```

c gwvs	gwvs initial index to groundwater slope.						
C							
c defid de	luid ceps	surs	uzs	ifws lzs	agws	gwvs	
33	1000	0.000000	0.00000	0.40000	0.000000	9.000000	2.000000
0.5	500000						
33	2000	0.00000	0.00000	0.40000	0.00000	9.00000	2.000000
0.5	500000						
33	3000	0.000000	0.00000	0.40000	0.000000	9.00000	2.000000
0.5	500000						
33	4000	0.00000	0.00000	0.40000	0.00000	9.00000	2.000000
0.5	500000						
33	5000	0.000000	0.00000	0.40000	0.00000	9.000000	2.000000
0.5	500000						
33	6000	0.00000	0.00000	0.40000	0.00000	9.00000	2.000000
0.5	500000						
33	7000	0.000000	0.00000	0.40000	0.00000	9.000000	2.000000
0.5	500000						
33	8000	0.00000	0.00000	0.40000	0.00000	9.00000	2.000000
0.5	500000						
33	9000	0.00000	0.00000	0.40000	0.00000	9.00000	2.000000
0.5	500000						
33		0.000000	0.00000	0.40000	0.00000	9.000000	2.000000
0.5	500000						
33	11111	0.000000	0.00000	0.40000	0.00000	9.000000	2.000000
0.9	500000						

33 11112 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 11121 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 11122 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
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0.500000 33 11322	0.00000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 33 11411	0.00000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 33 11412	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 33 11421	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 11422	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 12111	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 12112	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000						2.000000
33 12121 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	
33 12122 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 12211 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 12212 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 12221 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 12222 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 12311 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 12312 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 12321 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 12322 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 12411 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
33 12412 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
33 12421 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
33 12422	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
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0.500000 33 13112	0.000000	0.000000	0.400000	0.000000	9.000000	2.00000
0.500000 33 13121	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 33 13122	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 13211	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 13212	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 13221	0.000000	0.000000	0.400000	0.00000	9.000000	2.000000
0.500000 33 13222	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000						

33 13231 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 13232 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 13311 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 13312 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 13321	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 13322	0.000000	0.000000	0.400000	0.000000	9.000000	2.00000
0.500000 33 13331	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 13411	0.00000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 13412	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 13421	0.00000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 33 13422	0.00000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 33 13431	0.00000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 33 13432	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 14121	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 14122	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 14131	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000						
33 14132 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14221 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14222 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14231 0.500000	0.00000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14232 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14321 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14322 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14331 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14332 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14421 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14422 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 14431	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 14432	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15121	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15122	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15131	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15132	0.00000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15221	0.00000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 33 15222	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15231	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15232	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15321	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15322	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000	0.00000	3.00000	0.100000	0.00000	J.00000	2.000000

33 15331 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 15332 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
33 15421 0.500000	0.000000	0.000000	0.400000	0.00000	9.000000	2.000000
33 15422 0.500000	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
33 15431	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 33 15432	0.00000	0.00000	0.400000	0.00000	9.000000	2.000000
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0.500000 40 1000	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 2000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 3000	0.00000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 4000	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 5000	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 6000	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 7000	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
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0.500000 40 9000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 10000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000						
40 11111 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 11112 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 11121 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
40 11122 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
40 11211 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 11212 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
40 11221 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 11222 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 11311 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 11312 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 11321 0.500000	0.000000	0.000000	0.400000	0.00000	9.000000	2.000000
40 11322 0.500000	0.000000	0.000000	0.400000	0.00000	9.000000	2.000000
40 11411 0.500000	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
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0.500000 40 11421	0.00000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 11422	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12111	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 12112	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12121	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12122	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12211	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12212	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000	-					

40 12221 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 12222 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 12311 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 12312	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12321	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12322	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12411	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12412	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12421	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 12422	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13111	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 13112	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 13121	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13122	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000						2.000000
0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	
40 13212 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 13221 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 13222 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 13231 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 13232 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.00000
40 13311 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
40 13312 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
40 13321 0.500000	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
40 13322	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13331	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13411	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13412	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13421	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13422	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13431	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 13432	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 14121	0.00000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 14122	0.000000	0.00000	0.400000	0.000000	9.000000	2.000000
0.500000 40 14131	0.000000	0.00000	0.400000	0.00000	9.000000	2.000000
0.500000 40 14132	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 14221	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000 40 14222	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
0.500000						
40 14231 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 14232 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000

40 14321 0.500000	0.000000	0.000000	0.400000	0.00000	9.000000	2.000000
40 14322 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 14331 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 14332 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 14421 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 14422 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 14431 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 14432 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15121 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15122 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15131 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15132 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15221 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15222 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15231 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15232 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15321 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15322 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15331 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15332 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15421 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15422 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15431 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 15432 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000
40 16000 0.500000	0.000000	0.000000	0.400000	0.000000	9.000000	2.000000

c150 mon-interception storage (cepscm) c only required if vcsfg=1 in pwat-parm1 (see card 100) C c defid parameter group id
c deluid landuse id
c jan-dec interception storage capacity at start of each month (inches) c defid deluid jan feb mar apr may jun jul aug sep oct nov dec C----c160 mon-upper zone nominal storage (uzsnm) С only required if vuzfg=1 in pwat-parm1 (see card 100) С defid parameter group id С c deluid landuse id C jan-dec upper zone nominal storage at start of each month (inches) С c defid deluid jan feb mar apr may jun jul aug sep oct nov dec c170 mon-Manning's roughness coefficient (nsurm) only required if vnnfg=1 in pwat-parm1 (see card 100) C С c defid parameter group id
c deluid landuse id jan-dec Manning's roughness coefficient at start of each month (none) C c defid deluid jan feb mar apr may jun jul aug sep oct nov dec C----c180 mon-interflow inflow parameter (intfwm)

```
only required if vifwfg=1 in pwat-parm1 (see card 100)
    defid parameter group id deluid landuse id
С
C
    jan-dec interflow inflow parameter at start of each month (none)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c190 mon-interflow recession constant (ircm)
    only required if vircfg=1 in pwat-parm1 (see card 100)
C
С
  defid parameter group id
C
c deluid landuse id
    jan-dec interflow recession constant at start of each month (none)
C
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c200 mon-lower zone evapotranspiration parameter (lzetpm)
   only required if vlefg=1 in pwat-parm1 (see card 100)
C
С
С
           parameter group id
    deluid landuse id
C
   jan-dec lower zone evapotranspiration parameter at start of each month (none)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C----
c201 Irrigation Application Option Flags
cIrrigation flag decide whether to run irrigation
C
    irrigfg if = 1 run irrigation option
С
   petfg if = 1 use constant PET rather than time series from the air file
C
    monVaryIrrig if = 1 use monthly varying ET coefficient
C
c irrigfg petfg monVaryIrrig
  1 1 1
c202 Irrigation PET Value
c defid Group ID number.
c petval Constant PET value to calculate actual ET (in/hr)
c defid petval
  33 0.500000
40 0.500000
c203 Irrigation Application Options
  defid Group ID number.
deluid Landuse ID number
C
C
c startmonth startmonth of irrigation requirement
  endmonth endmonth of irrigation requirement fraction1 fraction of irrigation requirement applied over the canopy.
С
C
c fraction2 fraction of irrigation water applied directly to the soil surface.
  fraction3 fraction of irrigation water applied to the upper soil zone via buried systems fraction4 fraction of irrigation water likewise applied to the lower soil zone.
C
С
  fraction5 fraction of irrigation water entering directly into the local groundwater, such as seepage
C
irrigation.
c etcoeff
               Coefficient to calculate actual ET, based on PET.
   etcoeff Coefficient to calculate actual ET, based on PET.

etdays Number of threshold days to calculate irrigation demand (pet*etcoeff - precip)
C
               (if etdays = 0 then irrigation demand = pet * etcoeff)
С
c defid deluid startmonth endmonth fraction1 fraction2 fraction3 fraction4 fraction5 etcoeff etdays
       33 1000 1 12 0.000000
                                               0.000000
                                                              0.000000
                                                                            0.000000
                                                                                           0.000000
                   0
1
0
       1.000000
                                  0.000000
                                                                             0.000000
                           12
       33 2000
                                                 0.000000
                                                               0.000000
                                                                                            0.000000
       1.000000
       33 3000 1
                          12
                                  0.000000
                                               0.000000
                                                               0.000000
                                                                            0.000000
                                                                                            0.000000
                    0
       1.000000
                          12
       33 4000
                                  0.000000
                                                0.000000
                                                               0.000000
                                                                            0.000000
                                                                                            0.000000
                    0
       1.000000
       33 5000 1
                          12
                                  0.000000
                                                0.000000
                                                               0.000000
                                                                            0.000000
                                                                                            0.000000
       1.000000
                     0
       33 6000
                          12
                                   0.000000
                                                 0.000000
                                                               0.000000
                                                                             0.000000
                                                                                            0.000000
                     1
       1.000000
       33 7000
                                   0.000000
                   1
                          12
                                                 0.000000
                                                               0.000000
                                                                             0.000000
                                                                                            0.000000
       1.000000
                     0
       33 8000 1
                          12
                                  0.000000
                                                 0.000000
                                                               0.000000
                                                                            0.000000
                                                                                            0.000000
       1.000000
                    0
                                                                             0.000000
                          12
                                                 0.000000
       33 9000
                    1
                                   0.000000
                                                               0.000000
                                                                                            0.000000
       1.000000
                    0
```

C

33 10000 1.000000	1 0	12	1.000000	0.00000	0.000000	0.000000	0.000000
33 11111	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 11112	0 1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 11121	0 1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 11122	0 1	12	1.000000	0.00000	0.000000	0.00000	0.000000
1.000000 33 11211	0 1	12	1.000000	0.00000	0.00000	0.00000	0.000000
1.000000 33 11212	0	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
33 11221 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11222 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11311 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11312 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11321 1.000000	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11322 1.000000	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
33 11411	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 11412	0	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 11421	0 1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 11422	0 1	12	1.000000	0.00000	0.000000	0.000000	0.000000
1.000000 33 12111	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 33 12112	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 33 12121	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
33 12122 1.000000	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12211 1.000000	1 0	12	0.000000	0.00000	0.000000	0.000000	0.000000
33 12212 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12221 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12222 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12311 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12312 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 12321	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 12322	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 12411	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 12412	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000 33 12421	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 33 12422	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 33 13111	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000	0			0.000000	0.000000	0.000000	0.000000
33 13112 1.000000	1 0	12	0.000000				
33 13121 1.000000	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 13122 1.000000	1 0	12	0.000000	0.00000	0.000000	0.000000	0.000000
33 13211 1.000000	1 0	12	0.000000	0.00000	0.000000	0.000000	0.000000
33 13212 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
	-						

33 13221	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 13222	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 13231	0 1	12	0.00000	0.00000	0.00000	0.00000	0.000000
1.000000 33 13232	0 1	12	0.00000	0.00000	0.00000	0.00000	0.000000
1.000000 33 13311	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
33 13312 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 13321 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 13322 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 13331 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 13411	1	12	0.00000	0.00000	0.00000	0.000000	0.000000
1.000000 33 13412	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 13421	0 1	12	0.000000	0.00000	0.00000	0.000000	0.000000
1.000000 33 13422	0 1	12	0.00000	0.00000	0.00000	0.00000	0.000000
1.000000 33 13431	0 1	12	0.00000	0.000000	0.000000	0.00000	0.000000
1.000000 33 13432	0 1	12	0.00000	0.000000	0.00000	0.00000	0.000000
1.000000 33 14121	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
33 14122 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 14131 1.000000	1 0	12	0.00000	0.00000	0.00000	0.000000	0.000000
33 14132 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 14221 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 14222 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 14231	1	12	0.00000	0.00000	0.00000	0.000000	0.000000
1.000000 33 14232	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 14321	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 14322	0 1	12	0.00000	0.00000	0.00000	0.00000	0.000000
1.000000 33 14331	0 1	12	0.00000	0.000000	0.00000	0.00000	0.000000
1.000000 33 14332	0 1	12	0.00000	0.000000	0.00000	0.00000	0.000000
1.000000 33 14421	0 1	12	0.00000	0.000000	0.000000	0.00000	0.000000
1.000000 33 14422	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	1						
33 14431 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 14432 1.000000	1 0	12	0.00000	0.000000	0.000000	0.000000	0.000000
33 15121 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 15122 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 15131	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 15132	0	12	0.000000	0.00000	0.00000	0.000000	0.000000
1.000000 33 15221	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 33 15222	0 1	12	0.000000	0.00000	0.00000	0.000000	0.000000
1.000000 33 15231	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 33 15232	0 1	12	0.00000	0.00000	0.00000	0.00000	0.000000
1.000000	0						

33 15321	1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000 33 15322	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000 33 15331	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 33 15332	0 1	12	0.00000	0.00000	0.00000	0.00000	0.000000
1.000000	0						
33 15421 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 15422 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 15431 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 15432 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
33 16000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 1000	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 2000	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 3000	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 4000	0 1	12	0.00000	0.00000	0.00000	0.00000	0.000000
1.000000 40 5000	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000	0						
40 6000 1.000000	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 7000 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 8000 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 9000 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 10000 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11111	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11112	0	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11121	0 1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11122	0 1	12	1.000000	0.00000	0.000000	0.000000	0.000000
1.000000 40 11211	0 1	12	1.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 11212	0 1	12	1.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 11221	0 1	12	1.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 11222	0			0.000000	0.000000	0.000000	0.000000
1.000000	0	12	1.000000				
40 11311 1.000000	1 0	12	1.000000	0.00000	0.000000	0.000000	0.000000
40 11312 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11321 1.000000	1 0	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11322 1.000000	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
40 11411	1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11412	0	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11421	0 1	12	1.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 11422	0 1	12	1.000000	0.00000	0.000000	0.000000	0.000000
1.000000 40 12111	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 12112	0 1	12	0.00000	0.00000	0.00000	0.00000	0.000000
1.000000 40 12121	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
40 12122 1.000000	1 0	12	0.000000	0.00000	0.000000	0.000000	0.000000

40 12211	1	12	0.000000	0.000000	0.000000	0.00000	0.000000
1.000000 40 12212	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 12221	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 12222	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 12311	0	12		0.000000	0.000000	0.000000	0.000000
1.000000	0		0.000000				
40 12312 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 12321 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 12322 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 12411 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 12412 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 12421	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 12422	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13111	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13112	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000 40 13121	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 13122	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 13211	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0						
40 13212 1.000000	1 0	12	0.000000	0.00000	0.000000	0.000000	0.000000
40 13221 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 13222 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 13231 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 13232 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 13311 1.000000	1 0	12	0.00000	0.000000	0.000000	0.000000	0.000000
40 13312	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13321	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13322	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13331	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 13411	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 13412	0 1	12	0.000000	0.00000	0.000000	0.00000	0.000000
1.000000 40 13421	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0				0.000000		
40 13422 1.000000	0	12	0.000000	0.000000		0.000000	0.000000
40 13431 1.000000	1 0	12	0.000000	0.00000	0.000000	0.000000	0.000000
40 13432 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 14121 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 14122 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 14131 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 14132	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14221	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14222	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000	0						

40 14231	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14232	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14321	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14322	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14331	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14332	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14421	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 14422	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14431	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 14432	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 15121	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 15122	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 15131	0 1	12	0.00000	0.000000	0.00000	0.00000	0.000000
1.000000 40 15132	0 1	12	0.000000	0.00000	0.00000	0.00000	0.000000
1.000000 40 15221	0 1	12	0.00000	0.000000	0.000000	0.000000	0.000000
1.000000 40 15222	0 1	12	0.00000	0.000000	0.000000	0.000000	0.000000
1.000000 40 15231	0 1	12	0.00000	0.00000	0.000000	0.000000	0.000000
1.000000 40 15232	0 1	12	0.000000	0.00000	0.000000	0.000000	0.000000
1.000000 40 15321	0 1	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 15322	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 15331	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 15332	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000 40 15421	0	12	0.000000	0.000000	0.000000	0.000000	0.000000
1.000000	0	12			0.000000		0.000000
1.000000	1		0.000000	0.000000		0.000000	
40 15431 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 15432 1.000000	1	12	0.000000	0.000000	0.000000	0.000000	0.000000
40 16000 1.000000	1 0	12	0.000000	0.000000	0.000000	0.000000	0.000000

C-----

c204 Monthly-variable ET coefficients

0.000000

0.000000

0.000000

С c defid deluid monETCs1 monETCs2 monETCs3 monETCs4 monETCs5 monETCs6 monETCs7 monETCs8 monETCs9 monETCs10 monETCs11 monETCs12 33 1000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 33 2000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 33 3000 0.000000 0.000000 0.000000 0.000000 0.000000 0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 4000 33 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 5000 0.000000 0.000000 33 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 6000 0.000000 0.000000 0.000000 33 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 7000 33 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 8000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 33

0.000000

0.000000

0.000000

c defid Group ID number.

c deluid Landuse ID number

c monetcs Monthly-variable coefficient to calculate actual ET for Jan..Dec

33 9000	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 10000	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11111	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237					0.011307
		0.011520	0.009339	0.006252	0.000000	0 011505
33 11112	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11121	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11122	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
	0.000569	0.001419			0.006185	0.011507
			0.001327	0.005918		0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11212	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11221	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11222	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0.011007
33 11311	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
						0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11312	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11321	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11322	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0.011007
33 11411	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
						0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11412	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11421	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
33 11422	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
						0 000000
	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 12112	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 12121	0.000000	0.00000	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 12122	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
	0.000000	0.000000		0.000000	0.000000	0.000000
			0.000000			0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 12212	0.000000	0.00000	0.00000	0.000000	0.00000	0.000000
0.000000	0.000000	0.00000	0.00000	0.000000	0.000000	
33 12221	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.00000	0.00000	0.000000	0.00000	0.000000	
33 12222	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 12311	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000						0.00000
	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
33 12312	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 12321	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.00000	0.00000	0.000000	0.00000	0.000000	
33 12322	0.00000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 12411	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0 000000
33 12412	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 12421	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.00000	0.000000	0.000000	
33 12422	0.000000	0.00000	0.00000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 13111	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	00000
33 13112	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 13121	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.00000	0.000000	0.000000	
33 13122	0.000000	0.00000	0.00000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.00000	0.000000	0.000000	
33 13211	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
3.00000	3.30000	0.00000	3.00000	0.00000	3.300000	

33 13212	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
				0.000000	0.000000	0 000000
33 13221	0.000000	0.000000	0.000000			0.000000
0.000000	0.000000	0.00000	0.00000	0.00000	0.00000	
33 13222	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 13231	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 13232	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 13311	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0.00000
33 13312	0.000000	0.00000	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 13321	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000	0.00000	0.000000	0.00000	0.00000	
33 13322	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 13331	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 13411						0.000000
	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.00000	0.00000	0.00000	
33 13412	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 13421	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 13422	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
33 13431	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000						0.00000
	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
33 13432	0.000000	0.00000	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 14121	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14122	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14131	0.000000	0.00000	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 14132	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 14221	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 14222	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14231	0.00000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14232	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 14321	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
	0.000000				0.000000	0.00000
0.000000		0.000000	0.000000	0.000000		0 00000
33 14322	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
33 14331	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14332	0.000000	0.00000	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 14421	0.000000	0.00000	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 14422	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0.00000
33 14431	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.00000	
33 14432	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 15121	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 15122	0.000000	0.00000	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 15131	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	3.00000
						0 000000
	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 15221	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 15222	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.00000	
33 15231	0.000000	0.000000	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
3.223000	2.20000	1.00000	2.30000	1.00000		

33 15232	0.000000	0.00000	0.00000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
33 15321	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 15322	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 15331	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 15332	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.00000	0.000000	0.000000	
33 15421	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.00000	0.00000	0.000000	0.00000	0.000000	
33 15422	0.000000	0.00000	0.00000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
33 15431	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
33 15432	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
33 16000	0.000000	0.000000	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 1000	0.000000	0.00000	0.00000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
40 2000	0.000000	0.00000	0.00000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 3000	0.000000	0.000000	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 4000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
	0.000000					0.00000
0.000000		0.000000	0.000000	0.000000	0.000000	0 000000
40 5000	0.000000	0.00000	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 6000	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
40 7000	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 8000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 9000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
						0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 011505
40 10000	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11111	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11112	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11121	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11122	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0.011307
						0 011507
40 11211	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11212	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11221	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11222	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11311	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11312	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0.011007
	0.000569	0.001419		0.005918	0.006185	0.011507
			0.001327			0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	0 011505
40 11322	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11411	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 11412	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.00000	
40 11421	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.00000	
40 11422	0.000569	0.001419	0.001327	0.005918	0.006185	0.011507
0.012554	0.013237	0.011520	0.009339	0.006252	0.000000	
40 12111	0.000000	0.0011320	0.000000	0.000232	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0 000000
40 12112	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00====
40 12121	0.000000	0.00000	0.00000	0.00000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.00000	

40 12122	0.000000	0.00000	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 12211	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0.00000
0.000000	0.000000	0.00000	0.00000	0.00000	0.00000	
40 12212	0.000000	0.00000	0.00000	0.000000	0.00000	0.000000
0.000000	0.000000	0.00000	0.00000	0.000000	0.000000	
40 12221	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.00000	0.00000	0.000000	0.00000	0.00000	
40 12222	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 12311	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 12312						0 000000
	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.00000	
40 12321	0.000000	0.00000	0.00000	0.000000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
40 12322	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.00000	0.00000	0.000000	0.00000	0.00000	
40 12411	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 12412	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
				0.000000		0 000000
40 12421	0.000000	0.00000	0.000000		0.000000	0.00000
0.000000	0.000000	0.00000	0.00000	0.00000	0.00000	
40 12422	0.000000	0.00000	0.00000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13111	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.00000	
40 13112	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.00000	
40 13121	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0 000000
40 13122	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.00000	0.000000	0.00000	
40 13211	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
40 13212	0.00000	0.00000	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13221	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.00000	
40 13222	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000		0.000000	0.000000		0.00000
		0.00000			0.000000	0 000000
40 13231	0.000000	0.00000	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000	0.00000	0.00000	0.000000	0.00000	
40 13232	0.000000	0.00000	0.00000	0.00000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.00000	0.000000	
40 13311	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.00000	0.00000	0.000000	0.00000	0.00000	
40 13312	0.000000	0.00000	0.00000	0.000000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13321	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	0 000000
40 13331	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13411	0.000000	0.00000	0.00000	0.00000	0.00000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13412	0.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.000000	0.00000	0.00000	0.000000	0.00000	0.00000	
40 13421	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13422	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
						0.00000
	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	
40 13432	0.000000	0.00000	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000	0.00000	0.00000	0.000000	0.00000	
40 14121	0.000000	0.000000	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.00000	
40 14122	0.000000	0.00000	0.00000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.00000	
40 14131	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	3.33000
40 14132	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000						0.000000
	0.000000	0.00000	0.000000	0.000000	0.000000	0 000000
40 14221	0.000000	0.00000	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	

40 14222	0.00000	0.00000	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000	0.000000	0.000000	0.00000	0.000000	
40 14231	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000	0.000000	0.000000	0.00000	0.000000	
40 14232	0.000000	0.000000	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.00000	0.000000	
40 14321	0.000000	0.000000	0.000000	0.00000	0.000000	0.000000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
40 14322	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 14331	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 14332	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 14421	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 00000
40 14422	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
40 14431	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 14432	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 15121	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 15122	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 15131	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 15132	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0 000000
40 15221	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000 40 15222	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000			0.00000	0.00000
40 15231			0.000000	0.000000		0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 15232	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.00000	0.00000
40 15321	0.000000	0.00000	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000	0.00000	0.000000	0.000000	0.000000	0.00000
40 15322	0.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
40 15331	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 15332	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
40 15421	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
40 15422	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 15431	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 15432	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
40 16000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00000
0.00000	0.00000	0.00000	3.00000	0.00000	3.00000	

C------

```
c205 Irrigation Withdrawal Options
c Irrigation withdrawal information for each watershed
    subbasin subbasin id
               reach id from where water is withdrawn (if reach does not exist then
С
    rchid
                etdemand is assumed to be satisfied from an external source)
С
С
    irrigdep
                depth of irrigation withdrawal pipe (ft)
С
c subbasin rchid
       6665 0
                    0.000000
       6671
              0
                     0.000000
            0
       6673
                    0.000000
       6674 0
                    0.000000
       6675 0 0.000000
6684 0 0.000000
6839 0 0.000000
       6844 0
6850 0
                    0.000000
       6856 0
                    0.000000
       6859 0
6861 0
                    0.000000
                   0.000000
```

```
C
     defid
            parameter group id
С
            general quality id
name of qual (must be a continuous string)
С
     dwqid
С
    gname
    qunit
             units for quality constituent output (mg/l), (ug/l), or (#/100ml)
C
     qsdfq
            if = 0 no sediment associated qual
С
       if = 1 sediment associated in pervious/impervious land (qsdfg should be > 0 in card 281)
С
       if = 2 sediment associated in pervious/impervious land
C
              and sediment associated qual is added to the dissolved part
             if = 0 general quality constituent
С
     qasdfq
             if = 1 general quality constituent simulated as a sediment (only one qual can be simulated as a
С
sediment in each group)
             if = 1 then then accumulation and removal occur daily
C
              if = 2 then then accumulation and removal occur every interval
C
     potfcfq if = 1 then apply background concentration potency factor (card 260) to only surface output
C
             if = 2 then apply background concentration potency factor (card 260) to total land output
С
С
              qname qunit qsdfg gqsdfg qsofg potfcfg
c defid dwgid
                             (mg/1) 0
       33
                      TN
       33
              7
                      ΤP
                             (mg/1) 2
                                           0
                                                    2
                                                           1
       33
              10
                      TCd
                             (ug/1) 2
                                            0
                                                    2
                             (ug/l) 2
                                          0
       33
                      TCu
                                                    2
              11
                                                           1
       33
              12
                    TPb
                             (ug/1) 2
                                          0
                                                   2
                                          0
0
       33
              14
                      TZn
                             (ug/1) 2
                                                   2
                                                           1
       40
              3
                      TN
                             (mg/1) 0
                                                    2
              7
                             (mg/1) 2
       40
                      TP
              10
                      TCd
                             (ug/1) 2
                                           0
       40
                                                   2
                                                           1
       40
              11
                      TCu
                             (ug/1) 2
                                            0
                                                    2
                             (ug/l) 2
       40
              12
                      TPb
                                           0
                                                    2
                                                           1
       40
              14
                      TZn
                             (ug/1) 2
                                           0
                                                    2
                                                           1
C255 subsurface quality control
C
     (value of 0 = use constant qual-input; 1 = use corresponding monthly variable card)
С
С
                if = 1 the accumulation rate and limiting storage of QUALOF varies monthly (cards 270, 271)
C
     vaofa
С
                if = 1 the constituent is a QUALSURO (surface flow associated).
                if = 1 the concentration of this constituent in surface outflow varies monthly (card 272)= 1
     vsacfa
C
read table 272
    gifwfg
                if = 1 the constituent is a QUALIF (interflow associated).
C
                if = 1 the concentration of this constituent in interflow outflow varies monthly (card 273)=
    viqcfq
1 read table 273
                if = 1 the constituent is a QUALGW (groundwater associated).
C
    qaqwfq
С
     vaqcfq
                if = 1 the concentration of this constituent in groundwater outflow varies monthly (card 274)
    adfalnd
                if = 1 atmosperic deposition on land
C
               if = 1 atmosperic dry deposition varies monthly on land (card 275)
C
     maddfglnd
    mawdfglnd if = 1 atmosperic wet deposition varies monthly on land (card 276)
C
С
c vqofg qsowfg vsqcfg qifwfg viqcfg qagwfg vaqcfg adfglnd maddfglnd mawdfglnd 0 1 0 1 0 1 0 1 0 0 0 \phantom{-}
c-----
C260 qual-input
     storage on surface and nonseasonal parameters
С
C
     defid parameter group id
С
     dwaid
            general quality id
    deluid landuse id
С
            initial storage of QUALOF on surface (lb or #)
С
    potfw
            washoff potency factor if qsdfg > 0, card 250 (lb or \#)/ton-sediment
C
            scour potency pactor if qsdfg > 0, card 250 (lb or #)/ton-sediment
            background concentration potency pactor if qsdfg > 0, card 250 (lb or #)/ton-sediment
C
            accumulation rate of QUALOF on surface (lb or #)/acre/day
    sgolim maximum storage of QUALOF on surface (lb or #)/acre
С
    wsqop rate of surface runoff that removes 90% of stored QUALOF per hour (in/hr)
С
            concentration of constituent in surface outflow (mg/1), (ug/1), or (\#/100ml)
    ioqc
            concentration of constituent in interflow outflow (mg/l), (ug/l), or (#/100ml)
С
            concentration of constituent in groundwater outflow (mg/1), (ug/1), or (\#/100ml)
С
    aogc
    addc
            atmospheric dry deposition flux (lb/acre/day or #/acre/day)
C
            atmospheric wet deposition concentration (mg/l), (ug/l), or (#/100ml)
С
c the units of the following parameters are as follow:
c if in card 250, the unit is mg/l or ug/l, then M is lbs
c if in card 250, the unit is \#/100 \mathrm{ml}, then M is \#, in this case the unit for
c soqc, ioqc and aoqc should be \#/100ml instead of mg/l
c defid dwqid deluid sqo potfw potfs potfc acqop sqolim wsqop
                                                                                        ioqc
                                                                                               aoqc addc
awdc
                      1000 0.000000 0.000000 0.000000 0.000000 0.001000
              3
       0.500000
                      0.800000 0.000000 0.000000 0.000000
```

```
2000 0.000000 0.000000 0.000000 0.000000 0.001000
            0.500000
0.500000
            4000 0.000000 0.000000 0.000000 0.000000 0.060000
            1.400000

      5000
      0.000000
      0.000000
      0.000000
      0.000000
      0.080000

      0.600000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      600
      0.000000
      0.000000
      0.000000
      0.200000
      0.200000

1.400000
33 3
            0.800000
33 3
            8000 0.000000 0.000000 0.000000 0.000000 0.020000
33 3
            0.800000
33 3
0.800000
            0.000001
            11111 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
                                                                         0.000000
            11112 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
11121 0.000000 0.000000 0.000000 0.000000
33 3
            33 3
            11211 0.000000 0.000000 0.000000 0.000000 0.010000
33 3

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.0

      11212
      0.000000
      0.000000
      0.000000
      0.000000
      0.010000

0.800000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
            11221 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
11222 0.000000 0.000000 0.000000 0.000000
33 3
0.800000
            1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
                                                                         0 000000
            33 3
            33 3
            11322 0.000000 0.000000 0.000000 0.000000 0.010000
33 3

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    1.411
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

33 3
0.800000
            1.412 0.000000 0.000000 0.000000 0.000000 0.010000 1.640000 0.000000 0.000000 0.000000 0.010000 0.01421 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
0.800000
            1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
                                                                         0 000000
            1.1422 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
12111 0.000000 0.000000 0.000000 0.000000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            12112 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
12121 0.000000 0.000000 0.000000 0.000000
33 3
            33 3
0.800000
            12211 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.010000
12212 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
0.800000
                                                                        0.000000
33 3
0.800000
            1.640000 0.000000 1.000000 0.300000 0.000000
            0.800000
            12222 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
            12311 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            12312 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
            33 3
            12322 0.000000 0.000000 0.000000 0.000000 0.010000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000 12411 0.000000 0.000000 0.000000 0.000000
0.800000
33 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            12412 0.000000 0.000000 0.000000 0.000000 0.010000
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
```

```
12421 0.000000 0.000000 0.000000 0.000000 0.010000
             0.800000
0.800000
             13111 0.000000 0.000000 0.000000 1.500000
33 3

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    13112
    0.000000
    0.000000
    0.000000
    0.000000
    1.500000

    1.640000
    0.000000
    1.000000
    0.000000
    0.000000
    0.000000

    1.500000
    0.000000
    0.000000
    0.000000
    0.000000

8.000000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
13122 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
33 3
             13211 0.000000 0.000000 0.000000 0.000000 1.500000
33 3
             8.000000
33 3
8.000000
             8.000000
             13222 0.000000 0.000000 0.000000 0.000000 1.500000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000
8.000000
                                                                                   0.000000

    13231
    0.000000
    0.000000
    0.000000
    1.500000

    1.640000
    0.000000
    1.000000
    0.000000
    0.000000

    13232
    0.000000
    0.000000
    0.000000
    1.500000

33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
13311 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
33 3
             13312 0.000000 0.000000 0.000000 0.000000 1.500000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.0
13321 0.000000 0.000000 0.000000 1.500000
8.000000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
8.000000
             13322 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
13331 0.000000 0.000000 0.000000 0.000000 1.500000
33 3
8.000000
             1.640000 0.000000 1.000000 0.300000 0.000000
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             8.000000
33 3
             33 3
             13422 0.000000 0.000000 0.000000 0.000000 1.500000
33 3

    1.640000
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    1.000000
    0.300000
    0.000000
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    1.640000
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    1.500000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000

33 3
8.000000
             13432 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000
14121 0.000000 0.000000 0.000000 0.0050000
33 3
8.000000
             1.640000 0.000000 1.000000 0.300000 0.000000
0 500000
                                                                                   0 000000
             14122 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000 0.050000
14131 0.000000 0.000000 0.000000 0.050000
33 3
0.500000
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
33 3
             14132 0.000000 0.000000 0.000000 0.000000 0.050000
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             14221 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
             33 3
0.500000

    14231
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    0.000000
    0.000000

    1.640000
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    1.000000
    0.300000
    0.000000
    0.000000

    14232
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33 3
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33 3
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             1.640000 0.000000 1.000000 0.300000 0.000000
             0.500000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
             14331 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             14332 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
             33 3
0.500000
             14422 0.000000 0.000000 0.000000 0.000000 0.050000
33 3

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      14431
      0.000000
      0.000000
      0.000000
      0.050000

0.500000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             14432 0.000000 0.000000 0.000000 0.000000 0.050000
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
```

```
15121 0.000000 0.000000 0.000000 0.000000 0.050000
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
15122 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
0.500000
             15131 0.000000 0.000000 0.000000 0.000000 0.050000
33 3

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    15132
    0.000000
    0.000000
    0.000000
    0.000000
    0.050000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.500000
33 3

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    15222
    0.000000
    0.000000
    0.000000
    0.000000
    0.050000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

33 3
             15231 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
             0.500000
33 3
0.500000
             0.500000
             15322 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000
0.500000
                                                                                  0.000000
             15331 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
15332 0.000000 0.000000 0.000000 0.050000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
15421 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
33 3
             15422 0.000000 0.000000 0.000000 0.000000 0.050000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.0
15431 0.000000 0.000000 0.000000 0.050000
0.500000
33 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
             15432 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
16000 0.000000 0.000000 0.000000 0.000000
33 3
0.500000
             0.000001
                                                                                  0 000000
             0.000001
             2000 0.000000 4.462500 4.462500 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    3000
    0.000000
    4.462500
    4.462500
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    0.000000
    0.000000
    0.000000
    0.000000

    0.000000
    0.000000
    0.000000
    0.000000

0.000001
33 7
33 7
             33 7
0.000001
33 7
             6000 0.000000 7.875000 7.875000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      7000
      0.000000
      7.350000
      7.350000
      0.000000
      0.000000

0.000001
                                                                                  0.000000
             0.000001
                                                                                  0 000000
             8000 0.000000 1.050000 1.050000 0.000000 0.000000
             0.000001
             9000 0.000000 1.050000 1.050000 0.000000 0.000000
33 7
0.000001
             33 7
             11111 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
             1.640000 0.000000 0.400000 0.200000 0.000000
             11112 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.0
33 7
0.000001
             11121 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.0
11122 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
0.000001
                                                                                  0.000000
33 7
0.000001
             1.640000 0.000000 0.400000 0.200000 0.000000
             0.000001
             11212 0.000000 2.000000 2.000000 0.000000 0.000000
             1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
             11221 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
             1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
             11222 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
             1.640000 0.000000 0.400000 0.200000 0.000000
             11311 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.
33 7
             11312 0.000000 2.000000 2.000000 0.000000 0.000000
33 7

      1.640000
      0.000000
      0.400000
      0.200000
      0.000000
      0.000000

      11321
      0.000000
      2.000000
      0.000000
      0.000000
      0.000000

0.000001
33 7
             1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
             11322 0.000000 2.000000 0.000000 0.000000
             1.640000 \qquad 0.000000 \qquad 0.400000 \qquad 0.200000 \qquad 0.000000 \qquad 0.000000
0.000001
```

```
11411 0.000000 2.000000 2.000000 0.000000 0.000000
            0.000001
0.000001
33 7
            11421 0.000000 2.000000 2.000000 0.000000 0.000000
            1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
            11422 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
12111 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
            12112 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.
33 7
            12121 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
            12122 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
33 7
0.000001
            0.000001
            12212 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
                                                                           0.000000
            12222 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
12311 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
33 7
            12312 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
0.000001
            1.640000 0.000000 0.400000 0.200000 0.000000
            12321 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
            1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
            12322 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
12411 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
0.000001
            1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
                                                                           0 000000
            12412 0.000000 2.000000 2.000000 0.000000 0.000000

1.640000 0.000000 0.400000 0.200000 0.000000 0.000000

12421 0.000000 2.000000 2.000000 0.000000 0.000000
            0.000001
33 7
            13111 0.000000 8.000000 8.000000 0.000000 0.000000
33 7

    1.640000
    0.000000
    1.200000
    0.600000
    0.000000
    0.000000

    13112
    0.000000
    8.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.200000
    0.600000
    0.000000
    0.000000

33 7
0.000001
            13121 0.000000 8.000000 8.000000 0.000000 0.000000

1.640000 0.000000 1.200000 0.600000 0.000000 0.0

13122 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
0.000001
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            1.640000 0.000000 1.200000 0.600000 0.000000
0.000001
                                                                           0 000000
            13212 0.000000 8.000000 8.000000 0.000000 0.000000
0.000001
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
            13221 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
            13222 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
            33 7
0.000001
            13232 0.000000 8.000000 0.000000 0.000000

1.640000 0.000000 1.200000 0.600000 0.000000 0.0

13311 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
0.000001
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33 7
0.000001
            1.640000 0.000000 1.200000 0.600000 0.000000
            0.000001
            13321 0.000000 8.000000 8.000000 0.000000 0.000000
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
            13322 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
            13331 0.000000 8.000000 8.000000 0.000000 0.000000
33 7
            1.640000 0.000000 1.200000 0.600000 0.000000

    13411
    0.000000
    8.000000
    8.000000
    0.000000
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    1.640000
    0.000000
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    0.000000
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33 7
            13412 0.000000 8.000000 8.000000 0.000000 0.000000
33 7

      1.640000
      0.000000
      1.200000
      0.600000
      0.000000
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      13421
      0.000000
      8.000000
      0.000000
      0.000000
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0.000001
33 7
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
            13422 0.000000 8.000000 8.000000 0.000000 0.000000
            1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
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13431 0.000000 8.000000 8.000000 0.000000 0.000000

    1.640000
    0.000000
    1.200000
    0.600000
    0.000000
    0.000000

    1.3432
    0.000000
    8.000000
    8.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
0.000001
                14121 0.000000 2.000000 2.000000 0.000000 0.000000
                1.640000 0.000000 0.200000 0.200000 0.000000
0.000001
               14122 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.200000 0.200000 0.000000
14131 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
                1.640000 0.000000 0.200000 0.200000 0.000000 0.000000

      14132
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

33 7
                14221 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
                1.640000 0.000000 0.200000 0.200000 0.000000
0.000001

    14222
    0.000000
    2.000000
    2.000000
    0.000000
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    1.640000
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    0.200000
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33 7
0.000001
               0.000001
                14232 0.000000 2.000000 0.000000 0.000000
                1.640000 0.000000 0.200000 0.200000 0.000000
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    14321
    0.000000
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    2.000000
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    1.640000
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                14322 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
               1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
14331 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
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33 7
                14332 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
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                1.640000 0.000000 0.200000 0.200000 0.000000
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33 7
                1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
33 7
                14422 0.000000 2.000000 0.000000 0.000000

      1.640000
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    14432
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                15121 0.000000 2.000000 2.000000 0.000000 0.000000
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33 7
                15131 0.000000 2.000000 2.000000 0.000000 0.000000
33 7

      1.640000
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33 7

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000

0.000001
33 7
                15221 0.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

      1.5222
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

0.000001
                1.640000 0.000000 0.200000 0.200000 0.000000
0.000001
                                                                                                 0 000000
               0.000001
                15232 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
                1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
                15321 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
                1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
                15322 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
                1.640000 0.000000 0.200000 0.200000 0.000000
                15331 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.200000 0.200000 0.200000 0.000000 0.
33 7
0.000001
33 7
                15332 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

      15421
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

0.000001
                                                                                                 0.000000
33 7
                1.640000 0.000000 0.200000 0.200000 0.000000
0.000001
               0.000001
                15431 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
                1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
                15432 0.000000 2.000000 2.000000 0.000000 0.000000
33 7
                1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
                33 7
                0.000001
               33 10
                2000 0.000000 0.015000 0.015000 0.000000 0.000000
33 10
                0.000001
33 10
0.000001
                4000 0.000000 0.015000 0.015000 0.000000 0.000000
                0.000001
```

```
5000 0.000000 0.007500 0.007500 0.000000 0.000000
     0.000001
0.000001
      7000 0.000000 0.025000 0.025000 0.000000 0.000000
      0.000001
     33 10
0.000001
33 10
0.000001
      33 10
      11111 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
     0.000001
33 10
0.000001
     33 10
0.000001
33 10
      11122 0.000000 0.005000 0.005000 0.000000 0.000000
      0.000001
                                    0.000000
     33 10
0.000001
33 10
     0.000001
33 10
      11222 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
0.000001
      11311 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
      0.000001
     33 10
0.000001
33 10
      0.000001
                                    0 000000
     33 10
0.000001
33 10
     0.000001
33 10
      11421 0.000000 0.005000 0.005000 0.000000 0.000000
33 10

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    11421
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
33 10
0.000001
     33 10
0.000001
33 10
      0.000001
                                    0 000000
     33 10
0.000001
33 10
0.000001
      12211 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
0.000001
      12212 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
     0.000001
33 10
0.000001
     33 10
0.000001
33 10
      0.000001
      12312 0.000000 0.005000 0.005000 0.000000 0.000000
      0.000001
      12321 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
      0.000001
      12322 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
      0.000001
      12411 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
      0.000001

    12412
    0.000000
    0.005000
    0.005000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

33 10
      12421 0.000000 0.005000 0.005000 0.000000 0.000000
33 10
     0.000001
33 10
0.000001
      1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
      13111 0.000000 0.001000 0.001000 0.000000 0.000000
      0.000001
```

```
13112 0.000000 0.001000 0.001000 0.000000 0.000000
      0.000001
0.000001
       13122 0.000000 0.001000 0.001000 0.000000 0.000000

    13122
    0.000000
    0.001000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    13211
    0.000000
    0.001000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    13212
    0.000000
    0.001000
    0.001000
    0.000000
    0.000000

0.000001
33 10
0.000001
33 10
      0.000001
33 10
       13222 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
      0.000001
33 10
0.000001
                                          0.000000
      33 10
0.000001
       13311 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
                                          0.000000
      33 10
0.000001
33 10
      0.000001
33 10
       13331 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
      0.000001
33 10
       0.000001
                                          0.000000
      33 10
0.000001
33 10
       0.000001
                                          0 000000
      33 10
0.000001
33 10
      0.000001
33 10
       14121 0.000000 0.001000 0.001000 0.000000 0.000000
33 10

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    14122
    0.000000
    0.001000
    0.001000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
33 10
0.000001
      33 10
0.000001
33 10
       0.000001
                                          0 000000
      33 10
0.000001
33 10
0.000001
       14231 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
0.000001
       14232 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
      0.000001
33 10
0.000001
      33 10
0.000001
                                          0.000000
33 10
       0.000001
       14332 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
       14421 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
       14422 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
       0.000001
       14431 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
      0.000001
33 10
       15121 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
      0.000001
33 10
0.000001
       1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
       15131 0.000000 0.001000 0.001000 0.000000 0.000000
       0.000001
```

```
15132 0.000000 0.001000 0.001000 0.000000 0.000000
          0.000001
0.000001
          15222 0.000000 0.001000 0.001000 0.000000 0.000000

      15222
      0.000000
      0.001000
      0.001000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.001000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.5232
      0.000000
      0.001000
      0.001000
      0.000000
      0.000000
      0.000000

0.000001
33 10
0.000001
33 10

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.001000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
33 10
          15322 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
          0.000001
33 10
0.000001
          33 10
0.000001
          15421 0.000000 0.001000 0.001000 0.000000 0.000000
33 10
          0.000001
                                                             0.000000
          33 10
0.000001
33 10
          0.000001
33 10
          33 10
          0.000001
33 11
          0.000001
                                                            0.000000
          33 11
0.000001
33 11
0.000001
          0 000000

      4000
      0.000000
      1.500000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000

      5000
      0.000000
      0.750000
      0.000000
      0.000000

0.000001
33 11
          0.000001
33 11
          7000 0.000000 2.500000 2.500000 0.000000 0.000000
33 11
          0.000001

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

33 11
0.000001
33 11
0.000001
33 11
0.000001
          1.640000 25.000000 0.000000 0.000000 0.000000
                                                             0 000000
          0.000001
33 11
0.000001
          11121 0.000000 0.500000 0.500000 0.000000 0.000000
33 11
0.000001
          11122 0.000000 0.500000 0.500000 0.000000 0.000000
33 11
          0.000001
33 11
0.000001
          33 11
0.000001
33 11
0.000001
          11222 0.000000 0.500000 0.500000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      11311
      0.000000
      0.500000
      0.500000
      0.000000
      0.000000

0.000001
33 11
0.000001
          11312 0.000000 0.500000 0.500000 0.000000 0.000000
33 11
          11321 0.000000 0.500000 0.500000 0.000000 0.000000
33 11
          0.000001
          11322 0.000000 0.500000 0.500000 0.000000 0.000000 0.000000 1.640000 0.000000 0.000000 0.000000 0.
33 11
          11411 0.000000 0.500000 0.500000 0.000000 0.000000
33 11
          0.000001
33 11
          1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
          11421 0.000000 0.500000 0.500000 0.000000 0.000000
          0.000001
```

```
11422 0.000000 0.500000 0.500000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

0.000001
0.000001
        12112 0.000000 0.500000 0.030000 0.000000 0.000000
0.000001
        33 11
0.000001
33 11
        12211 0.000000 0.500000 0.0030000 0.000000 0.000000 0.000000 1.640000 0.000000 0.000000 0.000000 0.
33 11
        12212 0.000000 0.500000 0.030000 0.000000 0.000000
33 11
        0.000001
33 11
0.000001
        0.000001
        12311 0.000000 0.500000 0.030000 0.000000 0.000000
        0.000001
                                                  0.000000
        33 11
0.000001
33 11
        0.000001
33 11
        12411 0.000000 0.500000 0.030000 0.000000 0.000000
33 11
        0.000001
33 11
        0.000001
                                                  0.000000
        33 11
0.000001
33 11
0.000001
        0 000000
        0.000001
33 11

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.100000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
33 11
33 11

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      13211
      0.000000
      0.100000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

0.000001
33 11
0.000001
        33 11
0.000001
33 11
0.000001
        0 000000
        0.000001
33 11
0.000001
        13232 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
        0.000001
33 11
        0.000001
33 11
0.000001
        33 11
0.000001
33 11
0.000001
        13331 0.000000 0.100000 0.100000 0.000000 0.000000
        0.000001
        13411 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
0.000001
        13412 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
        13421 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
        0.000001
33 11
33 11
        0.000001
33 11
        14121 0.000000 0.100000 0.100000 0.000000 0.000000
        1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
0.000001
```

```
14122 0.000000 0.100000 0.100000 0.000000 0.000000
     0.000001
0.000001
     14132 0.000000 0.100000 0.100000 0.000000 0.000000
     0.000001
33 11
0.000001
33 11
     0.000001
33 11
     14232 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
     0.000001
33 11
0.000001
                                   0.000000
     33 11
0.000001
     14331 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
     0.000001
                                   0.000000
     33 11
0.000001
33 11
     0.000001
33 11
     14431 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
     0.000001
33 11
     0.000001
                                   0.000000
     33 11
0.000001
33 11
0.000001
     0 000000
     0.000001
33 11

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.100000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.5222
      0.000000
      0.100000
      0.100000
      0.000000
      0.000000
      0.000000

0.000001
33 11
33 11
     0.000001
     33 11
0.000001
     33 11
0.000001
33 11
0.000001
     0 000000
     0.000001
33 11
0.000001
     15332 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
0.000001
     15421 0.000000 0.100000 0.100000 0.000000 0.000000
33 11
     0.000001
33 11
0.000001
     33 11
0.000001
33 11
     0.000001
     33 11
     0.000001
     1000 0.000000 0.432000 0.432000 0.000000 0.000000
33 12
     0.000001
     2000 0.000000 0.324000 0.324000 0.000000 0.000000
33 12
     1.640000 50.000000 0.000000 0.000000 0.000000
0.000001
     3000 0.000000 0.108000 0.108000 0.000000 0.000000
33 12
     1.640000 50.000000 0.000000 0.000000 0.000000
0.000001
     33 12
     5000 0.000000 0.378000 0.378000 0.000000 0.000000
33 12
     0.000001
33 12
     0.000001
     7000 0.000000 0.691200 0.691200 0.000000 0.000000
     0.000001
```

```
8000 0.000000 0.270000 0.270000 0.000000 0.000000
     0.000001
0.000001
     0.000001
33 12
0.000001
33 12

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1112
    0.000000
    0.000000
    0.000000
    0.000000

    1121
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
33 12
     11122 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
     0.000001
33 12
0.000001
     33 12
0.000001
     11221 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
     0.000001
                                 0.000000
     33 12
0.000001
33 12
     0.000001
33 12
     11321 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
     0.000001
33 12
     0.000001
     33 12
0.000001
33 12
     0.000001
                                 0 000000
     0.000001
33 12
     0.000001
33 12
     12112 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
     0.000001
33 12
0.000001
     33 12
0.000001
33 12
     0.000001
                                 0 000000
     0.000001
33 12
0.000001
     12222 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
     0.000001
     12311 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
     0.000001
33 12
0.000001
     33 12
0.000001
33 12
     0.000001
     12411 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
     0.000001
     12412 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
0.000001
     12421 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
     12422 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
     0.000001
33 12
     13112 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
     0.000001
33 12
     1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
     13122 0.000000 0.010000 0.010000 0.000000 0.000000
     0.000001
```

```
13211 0.000000 0.010000 0.010000 0.000000 0.000000
        0.000001
0.000001
        13221 0.000000 0.010000 0.010000 0.000000 0.000000

    13221
    0.000000
    0.010000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.010000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.010000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.010000
    0.000000
    0.000000

0.000001
33 12
0.000001
33 12
        0.000001
33 12
        13311 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
33 12
0.000001
        33 12
0.000001
        13322 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
                                                  0.000000
        33 12
0.000001
33 12
        0.000001
33 12
        13421 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
33 12
        0.000001
                                                  0.000000
        33 12
0.000001
33 12
        0.000001
                                                  0 000000
        0.000001
33 12
        0.000001
33 12
        14132 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001

      14221
      0.000000
      0.010000
      0.010000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

33 12
0.000001

    14222
    0.000000
    0.010000
    0.010000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    14231
    0.000000
    0.010000
    0.010000
    0.000000

33 12
0.000001
                                                  0.000000
33 12
        0.000001
                                                  0 000000
        33 12
0.000001
33 12
0.000001
        14322 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
        14331 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
33 12
0.000001

    1.4421
    0.000000
    0.010000
    0.010000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    14422
    0.000000
    0.010000
    0.010000
    0.000000

33 12
0.000001
33 12
        0.000001
        14431 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
        14432 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
0.000001
        15121 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        15122 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
33 12
        15132 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
        0.000001
33 12
        1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
        15222 0.000000 0.010000 0.010000 0.000000 0.000000
        0.000001
```

```
15231 0.000000 0.010000 0.010000 0.000000 0.000000
              0.000001
0.000001
              15321 0.000000 0.010000 0.010000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
33 12
0.000001
33 12
              0.000001
33 12
              15421 0.000000 0.010000 0.010000 0.000000 0.000000
33 12
              0.000001
33 12
0.000001
              33 12
0.000001
              15432 0.000000 0.010000 0.010000 0.000000 0.000000
33 12

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.000000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

0.000001
33 12
0.000001
33 14
              0.000001
33 14
              3000 0.000000 5.184000 5.184000 0.000000 0.000000
33 14
              0.000001
33 14
              0.000001
                                                                                     0.000000

      5000
      0.000000
      2.700000
      2.700000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000

      6000
      0.000000
      5.760000
      0.000000
      0.000000

33 14
0.000001
33 14
              0.000001
                                                                                     0 000000
              33 14
0.000001
33 14

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    9000
    0.000000
    5.400000
    5.400000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
33 14
              33 14
              0.000001
33 14
0.000001
              11112 0.000000 3.600000 3.600000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000 0.0

11121 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
0.000001
33 14
              1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                                     0 000000
              11122 0.000000 3.600000 3.600000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000

11211 0.000000 3.600000 3.600000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000
33 14
0.000001
33 14
0.000001
              11212 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
              1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
              11221 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
              1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
              11222 0.000000 3.600000 3.600000 0.000000 0.000000 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
33 14
0.000001
              1.311 0.000000 3.600000 3.600000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000 0.0

1.312 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
0.000001
33 14
              1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
              0.000001
              11322 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
0.000001
              1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
              11411 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
              1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
              11412 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
              1.640000 0.000000 0.000000 50.000000 0.000000
0.000001

      11421
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

33 14
              11422 0.000000 3.600000 3.600000 0.000000 0.000000
33 14

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      12111
      0.000000
      3.600000
      0.000000
      0.000000
      0.000000

0.000001
33 14
              1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 50.000000 \qquad 0.000000 \qquad 0.000000
0.000001
              12112 0.000000 3.600000 3.600000 0.000000 0.000000
              1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
```

```
12121 0.000000 3.600000 3.600000 0.000000 0.000000
                 12121 0.00000 3.000000 50.000000 0.000000 0.000000 12122 0.000000 3.600000 3.600000 0.000000 0.000000 0.000000 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
0.000001
                 12211 0.000000 3.600000 3.600000 0.000000 0.000000
                 1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                 12212 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000
12221 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
0.000001
33 14
0.000001
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000

      12222
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000

33 14
                 12311 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
                 0.000001
33 14
0.000001
                 12321 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
33 14
0.000001
                 12322 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
                 1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                                                          0.000000
                 12411 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000
12412 0.000000 3.600000 3.600000 0.000000 0.000000
33 14
0.000001
33 14
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.0000000 12421 0.000000 3.600000 3.600000 0.000000 0.000000 0.000000 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
33 14
                 12422 0.000000 3.600000 3.600000 0.000000 0.000000
33 14

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.0

    13111
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

0.000001
33 14

    13111
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    13112
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    13121
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

0.000001
33 14
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33 14
                 0.000001
33 14
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                 0.000001
33 14
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33 14
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33 14

      13232
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

0.000001
33 14
0.000001
33 14
0.000001
33 14

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      13322
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

0.000001
33 14
                 0.000001
33 14
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33 14
0.000001
                                                                                                          0.000000
33 14
                 1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                 13421 0.000000 0.720000 0.720000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000

13422 0.000000 0.720000 0.720000 0.000000 0.000000
0.000001
33 14
0.000001
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
                 13431 0.000000 0.720000 0.720000 0.000000 0.000000
33 14
                 33 14
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.0
14121 0.000000 0.720000 0.720000 0.000000 0.000000
1.640000 0.000000 0.720000 50.000000 0.000000 0.0
14122 0.000000 0.720000 0.720000 0.000000 0.000000
0.000001
33 14
33 14
                 0.000001
33 14
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
                 14132 0.000000 0.720000 0.720000 0.000000 0.000000
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
```

```
14221 0.000000 0.720000 0.720000 0.000000 0.000000
             0.000001
0.000001
             14231 0.000000 0.720000 0.720000 0.000000 0.000000
             0.000001
33 14
0.000001
33 14

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000

0.000001
33 14
0.000001
33 14
             0.000001
33 14
0.000001
33 14
0.000001
             14422 0.000000 0.720000 0.720000 0.000000 0.000000
33 14
             0.000001
33 14
0.000001
33 14

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      1.5122
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000

0.000001
33 14
33 14
             0.000001
33 14
             1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
             33 14
0.000001
33 14
             0.000001
33 14
0.000001
33 14
0.000001
33 14
33 14

    15321
    0.720000
    0.720000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.6332
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

0.000001
33 14
0.000001
33 14
0.000001
                                                                                  0.000000
33 14

      15332
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000
      0.000000

0.000001
33 14
0.000001
33 14
0.000001
             15431 0.000000 0.720000 0.720000 0.000000 0.000000
33 14
             33 14
             0.000001
33 14
0.000001
             40 3
0.500000
                                                                                   0.000000
40 3
0.500000
             3000 0.000000 0.000000 0.000000 0.000000 0.001000
             0.500000
             4000 0.000000 0.000000 0.000000 0.000000 0.060000
40 3
             1.400000
             5000 0.000000 0.000000 0.000000 0.000000 0.080000
40 3
             0.600000 0.000000 0.000000 0.000000 0.000000 0.000000
             6000 0.000000 0.000000 0.000000 0.000000 0.200000
40 3
             40 3
0.800000
             8000 0.000000 0.000000 0.000000 0.000000 0.020000
40 3
             0.800000
40 3
             1.640000 \qquad 4.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
0.000001
```

```
11111 0.000000 0.000000 0.000000 0.000000 0.010000
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
11112 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
0.800000
             11121 0.000000 0.000000 0.000000 0.000000 0.010000
40 3

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    11122
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000
    0.010000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

0.800000
40 3
             40 3
             11221 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
             0.800000
40 3
0.800000
             11311 0.000000 0.000000 0.000000 0.000000 0.010000 1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
             11312 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000
0.800000
                                                                                 0.000000
             11321 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
11322 0.000000 0.000000 0.000000 0.000000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.0000000
11411 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
40 3
             11412 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.0
11421 0.000000 0.000000 0.000000 0.000000 0.010000
0.800000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.800000
             11422 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
12111 0.000000 0.000000 0.000000 0.000000
40 3
0.800000
             1.640000 0.000000 1.000000 0.300000 0.000000
0.00000
                                                                                 0 000000
             12112 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
12121 0.000000 0.000000 0.000000 0.000000
0.800000
40 3
             40 3
             12211 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000

      12212
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000
      0.010000

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.

40 3
0.800000
             12221 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.0
12222 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
0.800000
                                                                                 0.000000
             1.640000 0.000000 1.000000 0.300000 0.000000
0.00000
                                                                                 0 000000
             12311 0.000000 0.000000 0.000000 0.000000 0.010000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
12312 0.000000 0.000000 0.000000 0.000000
0.800000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             12321 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             12322 0.000000 0.000000 0.000000 0.000000 0.010000
40 3
             40 3
0.800000
             12412 0.000000 0.000000 0.000000 0.000000 0.010000

1.640000 0.000000 1.000000 0.300000 0.000000 0.010000

12421 0.000000 0.000000 0.000000 0.000000
40 3
0.800000
                                                                                 0.000000
40 3
0.800000
             1.640000 0.000000 1.000000 0.300000 0.000000
             0.800000
             13111 0.000000 0.000000 0.000000 0.000000 1.500000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
8.000000
             13112 0.000000 0.000000 0.000000 0.000000 1.500000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             13121 0.000000 0.000000 0.000000 0.000000 1.500000
40 3
             40 3
             13211 0.000000 0.000000 0.000000 0.000000 1.500000
40 3
             8.000000
40 3
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
             13221 0.000000 0.000000 0.000000 0.000000 1.500000
             1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
8.000000
```

```
13222 0.000000 0.000000 0.000000 0.000000 1.500000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    1.321
    0.000000
    0.000000
    0.000000
    1.500000

    1.640000
    0.000000
    0.300000
    0.000000
    0.000000

8.000000
8.000000
            13232 0.000000 0.000000 0.000000 0.000000 1.500000
40 3

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      1.3311
      0.000000
      0.000000
      0.000000
      1.500000
      1.500000

      1.640000
      0.000000
      1.000000
      0.300000
      0.000000
      0.000000

      1.3312
      0.000000
      0.000000
      0.000000
      0.000000
      1.500000

8.000000
40 3
           1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
13321 0.000000 0.000000 0.000000 0.000000 1.500000
1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
40 3
            13322 0.000000 0.000000 0.000000 0.000000 1.500000
40 3
           8.000000
40 3
8.000000
           8.000000
            13412 0.000000 0.000000 0.000000 1.500000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000
8.000000
                                                                        0.000000
           40 3
           40 3
            13432 0.000000 0.000000 0.000000 0.000000 1.500000
40 3
           1.640000 0.000000 1.000000 0.300000 0.000000 0.0
14121 0.000000 0.000000 0.000000 0.000000 0.050000
8.000000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
           14122 0.000000 0.000000 0.000000 0.000000 0.050000
1.640000 0.000000 1.000000 0.300000 0.000000
14131 0.000000 0.000000 0.000000 0.050000
40 3
0.500000
            1.640000 0.000000 1.000000 0.300000 0.000000
0 500000
                                                                        0 000000

    14132
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000

    14221
    0.000000
    0.000000
    0.000000
    0.050000

0.500000
40 3
           0.500000
40 3
            14231 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
           40 3
0.500000

    14321
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000

    14322
    0.000000
    0.000000
    0.000000
    0.000000

40 3
0.500000
                                                                        0.000000
            1.640000 0.000000 1.000000 0.300000 0.000000
0 500000
                                                                        0 000000
           0.500000
40 3
0.500000
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            14421 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            14422 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
           40 3
0.500000
           14432 0.000000 0.000000 0.000000 0.000000 0.050000 1.640000 0.000000 0.000000 0.050000 0.050000 0.050000 0.000000 0.000000 0.050000
40 3
0.500000
                                                                        0.000000
40 3
0.500000
            1.640000 0.000000 1.000000 0.300000 0.000000
                                                                        0.000000
           0.500000
            15131 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
            15132 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            15221 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
           40 3
           15231 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
           0.500000
40 3
            1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
            15321 0.000000 0.000000 0.000000 0.000000 0.050000
           1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
0.500000
```

```
15322 0.000000 0.000000 0.000000 0.000000 0.050000

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    15331
    0.000000
    0.000000
    0.000000
    0.050000

    1.640000
    0.000000
    0.300000
    0.000000
    0.000000

0.500000
0.500000
           15332 0.000000 0.000000 0.000000 0.000000 0.050000
40 3

    1.640000
    0.000000
    1.000000
    0.300000
    0.000000
    0.000000

    1.6421
    0.000000
    0.000000
    0.000000
    0.000000
    0.050000

    1.6422
    0.000000
    0.000000
    0.000000
    0.000000
    0.050000

0.500000
0.500000
40 3
0.500000
           1.640000 0.000000 1.000000 0.300000 0.000000 0.000000
           15431 0.000000 0.000000 0.000000 0.000000 0.050000 1.640000 0.000000 1.000000 0.300000 0.000000 0.
40 3
           15432 0.000000 0.000000 0.000000 0.000000 0.050000
40 3
0.500000
           1.640000 0.000000 1.000000 0.300000 0.000000
           40 3
           0.000001
           0.000001
           2000 0.000000 4.462500 4.462500 0.000000 0.000000
           0 000001
                                                                       0.000000
             3000 \quad 0.000000 \quad 4.462500 \quad 4.462500 \quad 0.000000 \quad 0.000000 \\ 1.640000 \quad 0.000000 \quad 0.000000 \quad 0.000000 \quad 0.000000 \\ 
0.000001
           4000 0.000000 7.350000 7.350000 0.000000 0.000000
40 7
           0.000001
           40 7
           6000 0.000000 7.875000 7.875000 0.000000 0.000000
40 7
0.000001
           7000 0.000000 7.350000 7.350000 0.000000 0.000000
40 7
           0.000001
40 7
           8000 0.000000 1.050000 1.050000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      9000
      0.000000
      1.050000
      0.000000
      0.000000
      0.000000

0.000001
           0 000001
                                                                       0 000000
           0.000001
           11111 0.000000 2.000000 2.000000 0.000000 0.000000
           0.000001
40 7
           11121 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000
           11122 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.
40 7
0.000001
                                                                       0.000000

    11211
    0.000000
    2.000000
    2.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.400000
    0.200000
    0.000000
    0.000000

    11212
    0.000000
    2.000000
    0.000000
    0.000000

40 7
0.000001
                                                                       0.000000
           1.640000 0.000000 0.400000 0.200000 0.000000
0 000001
                                                                       0 000000
           11221 0.000000 2.000000 2.000000 0.000000 0.000000
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
           11222 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
           11311 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
           11312 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000
           11321 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.0
40 7
0.000001
40 7
           11322 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.400000
      0.200000
      0.000000
      0.0

      11411
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

0.000001
                                                                       0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000
                                                                       0.000000
0.000001
           11412 0.000000 2.000000 0.000000 0.000000
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
           11421 0.000000 2.000000 2.000000 0.000000 0.000000
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
           11422 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
           12111 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000
           12112 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
           1.640000 0.000000 0.400000 0.200000 0.000000
           12121 0.000000 2.000000 2.000000 0.000000 0.000000
40 7

      1.640000
      0.000000
      0.400000
      0.200000
      0.000000
      0.000000

      12122
      0.000000
      2.000000
      0.000000
      0.000000
      0.000000

0.000001
40 7
           1.640000 \qquad 0.000000 \qquad 0.400000 \qquad 0.200000 \qquad 0.000000 \qquad 0.000000
           12211 0.000000 2.000000 0.000000 0.000000
           1.640000 \qquad 0.000000 \qquad 0.400000 \qquad 0.200000 \qquad 0.000000 \qquad 0.000000
0.000001
```

```
12212 0.000000 2.000000 2.000000 0.000000 0.000000
             1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
12221 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
0.000001
40 7
             12222 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
             1.640000 0.000000 0.400000 0.200000 0.000000
             0.000001
0.000001
             1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
             12321 0.000000 2.000000 2.000000 0.000000 0.000000 1.640000 0.000000 0.400000 0.200000 0.000000 0.
40 7
             12322 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
0.000001
             1.640000 0.000000 0.400000 0.200000 0.000000
             12411 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
0.000001
             0.000001
             12421 0.000000 2.000000 2.000000 0.000000 0.000000
             1.640000 0.000000 0.400000 0.200000 0.000000
0.000001
                                                                                 0.000000
             12422 0.000000 2.000000 2.000000 0.000000 0.000000
             1.640000 0.000000 0.400000 0.200000 0.000000 0.000000
             13111 0.000000 8.000000 8.000000 0.000000 0.000000
             1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
13112 0.000000 8.000000 8.000000 0.000000 0.000000
1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
40 7
             13121 0.000000 8.000000 8.000000 0.000000 0.000000
40 7
0.000001
             1.640000 0.000000 1.200000 0.600000 0.000000
             13122 0.000000 8.000000 8.000000 0.000000 0.000000
40 7
             1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001

    13211
    0.000000
    8.000000
    8.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.200000
    0.600000
    0.000000
    0.000000

    13212
    0.000000
    8.000000
    0.000000
    0.000000

0.000001
             1.640000 0.000000 1.200000 0.600000 0.000000
0 000001
                                                                                 0 000000

    13221
    0.000000
    8.000000
    8.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.200000
    0.600000
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    13222
    0.000000
    8.000000
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0.000001
             1.640000 0.000000 1.200000 0.600000 0.000000 0.0000000
13231 0.000000 8.000000 8.000000 0.600000 0.000000
1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
40 7
             13232 0.000000 8.000000 8.000000 0.000000 0.000000
40 7
             0.000001
             13312 0.000000 8.000000 0.000000 0.000000
1.640000 0.000000 1.200000 0.600000 0.000000 0.0
13321 0.000000 8.000000 8.000000 0.000000 0.000000
0.000001
                                                                                 0.000000
             1.640000 0.000000 1.200000 0.600000 0.000000
0 000001
                                                                                 0 000000
             13322 0.000000 8.000000 8.000000 0.000000 0.000000
             1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
             13331 0.000000 8.000000 8.000000 0.000000 0.000000
0.000001
             1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
             13411 0.000000 8.000000 8.000000 0.000000 0.000000
40 7
             1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
             13412 0.000000 8.000000 8.000000 0.000000 0.000000
40 7
             1.640000 0.000000 1.200000 0.600000 0.000000

      13421
      0.000000
      8.000000
      8.000000
      0.000000
      0.000000

      1.640000
      0.000000
      1.200000
      0.600000
      0.000000
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40 7
0.000001
             13422 0.000000 8.000000 0.000000 0.000000

1.640000 0.000000 1.200000 0.600000 0.000000 0.0

13431 0.000000 8.000000 0.000000 0.000000
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0.000001
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             1.640000 0.000000 1.200000 0.600000 0.000000
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0.000001
             13432 0.000000 8.000000 8.000000 0.000000 0.000000
             1.640000 0.000000 1.200000 0.600000 0.000000 0.000000
0.000001
             14121 0.000000 2.000000 2.000000 0.000000 0.000000
             1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
             14122 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
             1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
             14131 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
             1.640000 0.000000 0.200000 0.200000 0.000000
             14132 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
             1.640000 0.000000 0.200000 0.200000 0.000000
             14221 0.000000 2.000000 2.000000 0.000000 0.000000
40 7

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

      14222
      0.000000
      2.000000
      0.000000
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      0.000000

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40 7
             1.640000 \qquad 0.000000 \qquad 0.200000 \qquad 0.200000 \qquad 0.000000 \qquad 0.000000
             14231 0.000000 2.000000 2.000000 0.000000 0.000000
             1.640000 \qquad 0.000000 \qquad 0.200000 \qquad 0.200000 \qquad 0.000000 \qquad 0.000000
0.000001
```

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14232 0.000000 2.000000 2.000000 0.000000 0.000000
         0.000001
0.000001
         14322 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
         1.640000 0.000000 0.200000 0.200000 0.000000
         14332 0.000000 2.000000 2.000000 0.000000 0.000000
0.000001
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000

    14421
    0.000000
    2.000000
    2.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.200000
    0.200000
    0.000000
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40 7
         14422 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
0.000001
         1.640000 0.000000 0.200000 0.200000 0.000000
         14431 0.000000 2.000000 2.000000 0.000000 0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
         0.000001
         15121 0.000000 2.000000 0.000000 0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000
0.000001
                                                       0.000000
         15122 0.000000 2.000000 2.000000 0.000000 0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
         15131 0.000000 2.000000 2.000000 0.000000 0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
15132 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
40 7
         15221 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
0.000001
         1.640000 0.000000 0.200000 0.200000 0.000000
         15222 0.000000 2.000000 0.000000 0.000000
40 7
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
         15231 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
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      15232
      0.000000
      2.000000
      0.000000
      0.000000
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0.000001
         1.640000 0.000000 0.200000 0.200000 0.000000
0 000001
                                                       0 000000
         15321 0.000000 2.000000 2.000000 0.000000 0.000000
1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
         15322 0.000000 2.000000 2.000000 0.000000 0.000000
         0.000001
40 7
         15332 0.000000 2.000000 2.000000 0.000000 0.000000
40 7
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
         15422 0.000000 2.000000 2.000000 0.000000 0.000000

      1.640000
      0.000000
      0.200000
      0.200000
      0.000000
      0.000000

      1.5431
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

0.000001
                                                       0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000
0 000001
                                                       0 000000
         15432 0.000000 2.000000 0.000000 0.000000
         1.640000 0.000000 0.200000 0.200000 0.000000 0.000000
0.000001
         40 7
0.000001
         1000 0.000000 0.017500 0.017500 0.000000 0.000000
40 10
         2000 0.000000 0.015000 0.015000 0.000000 0.000000
40 10
         0.000001
         40 10
0.000001
40 10
         4000 0.000000 0.015000 0.015000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    5000
    0.000000
    0.007500
    0.000000
    0.000000

0.000001
                                                       0.000000
40 10
         0.000001
         6000 0.000000 0.020000 0.020000 0.000000 0.000000
40 10
         0.000001
         7000 0.000000 0.025000 0.025000 0.000000 0.000000
40 10
         0.000001
40 10
         8000 0.000000 0.011250 0.011250 0.000000 0.000000
         0.000001
         9000 0.000000 0.003750 0.003750 0.000000 0.000000
40 10
         0.000001
         40 10
         11111 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
         0.000001
40 10
         1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
         11121 0.000000 0.005000 0.005000 0.000000 0.000000
         0.000001
```

```
11122 0.000000 0.005000 0.005000 0.000000 0.000000
      0.000001
0.000001
      11212 0.000000 0.005000 0.005000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    11221
    0.000000
    0.005000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.005000
    0.000000
    0.000000

    1.640000
    0.000000
    0.005000
    0.000000
    0.000000

0.000001
40 10
0.000001
40 10
0.000001
      11311 0.000000 0.005000 0.005000 0.000000 0.000000 1.640000 0.000000 0.000000 0.000000 0.
40 10
      11312 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
0.000001
      40 10
0.000001
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0.000001
      11411 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
      0.000001
                                        0.000000
      40 10
0.000001
      11421 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
      0.000001
40 10
      12111 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
0.000001
      12112 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
      0.000001
      40 10
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      0.000001
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      40 10
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      12222 0.000000 0.005000 0.005000 0.000000 0.000000
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      40 10
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      40 10
      12412 0.000000 0.005000 0.005000 0.000000 0.000000
0.000001
      12421 0.000000 0.005000 0.005000 0.000000 0.000000
40 10
      0.000001
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      13111 0.000000 0.001000 0.001000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
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    13112
    0.000000
    0.001000
    0.001000
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0.000001
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40 10
      0.000001
      13121 0.000000 0.001000 0.001000 0.000000 0.000000
      0.000001
      13122 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
      0.000001
40 10
      13211 0.000000 0.001000 0.001000 0.000000 0.000000
      13212 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
      0.000001
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      13222 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
      0.000001
40 10
      1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
      13232 0.000000 0.001000 0.001000 0.000000 0.000000
      0.000001
```

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13311 0.000000 0.001000 0.001000 0.000000 0.000000
        0.000001
0.000001
        13321 0.000000 0.001000 0.001000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
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    0.000000

    1.640000
    0.000000
    0.001000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
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    1.640000
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        13412 0.000000 0.001000 0.001000 0.000000 0.000000
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        0.000001
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        13431 0.000000 0.001000 0.001000 0.000000 0.000000
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        0.000000
        40 10
0.000001
        14121 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
        0.000001
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        14131 0.000000 0.001000 0.001000 0.000000 0.000000
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        0.000001
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                                                 0.000000

    14221
    0.000000
    0.001000
    0.001000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
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    0.000000

    14222
    0.000000
    0.001000
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    0.000000

40 10
0.000001
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        0 000001
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        40 10
0.000001
        14232 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
        0.000001
40 10
        14322 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
        0.000001

    14331
    0.000000
    0.001000
    0.001000
    0.000000
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    1.640000
    0.000000
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        14431 0.000000 0.001000 0.001000 0.000000 0.000000
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        14432 0.000000 0.001000 0.001000 0.000000 0.000000
0.000001
        15121 0.000000 0.001000 0.001000 0.000000 0.000000
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        0.000001
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        15131 0.000000 0.001000 0.001000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
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    15132
    0.000000
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0.000001
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40 10
        0.000001
        15221 0.000000 0.001000 0.001000 0.000000 0.000000
        0.000001
        15222 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
        0.000001
40 10
        15231 0.000000 0.001000 0.001000 0.000000 0.000000
        15232 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
        0.000001
40 10
        15322 0.000000 0.001000 0.001000 0.000000 0.000000
40 10
        0.000001
40 10
        1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
        15332 0.000000 0.001000 0.001000 0.000000 0.000000
        1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
0.000001
```

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15421 0.000000 0.001000 0.001000 0.000000 0.000000
       0.000001
0.000001
       15431 0.000000 0.001000 0.001000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.001000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
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    1.640000
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    0.000000
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0.000001
40 10
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40 10

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    1.750000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    2000
    0.000000
    1.500000
    0.000000
    0.000000

0.000001
40 11
40 11
       0.000001
40 11
0.000001
       0.000001
        5000 0.000000 0.750000 0.750000 0.000000 0.000000
40 11
0.000001
        0.000000

      6000
      0.000000
      2.000000
      2.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      7000
      0.000000
      2.500000
      0.000000
      0.000000
      0.000000

40 11
40 11
       0.000001
40 11
        9000 0.000000 0.375000 0.375000 0.000000 0.000000
40 11
0.000001
        40 11
        1.640000 25.000000 0.000000 0.000000 0.000000
0.000001
                                               0.000000
       40 11
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        0 000000
       0.000001
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       0.000001
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       11212 0.000000 0.500000 0.500000 0.000000 0.000000
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       0.000001
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        0 000000
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40 11
0.000001
        11322 0.000000 0.500000 0.500000 0.000000 0.000000
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0.000001
        11411 0.000000 0.500000 0.500000 0.000000 0.000000
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       0.000001
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       40 11
0.000001
                                               0.000000
40 11
0.000001
        12111 0.000000 0.500000 0.030000 0.000000 0.000000
       0.000001
       12112 0.000000 0.500000 0.030000 0.000000 0.000000
40 11
0.000001
       40 11
       12121 0.000000 0.500000 0.030000 0.000000 0.000000
       12122 0.000000 0.500000 0.030000 0.000000 0.000000
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        0.000001
       40 11
       12212 0.000000 0.500000 0.030000 0.000000 0.000000
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       0.000001
40 11
       1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
        12222 0.000000 0.500000 0.030000 0.000000 0.000000
       0.000001
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12311 0.000000 0.500000 0.030000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
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    1.640000
    0.000000
    0.000000
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    1.640000
    0.000000
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    1.640000
    0.000000
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0.000001
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        12321 0.000000 0.500000 0.030000 0.000000 0.000000
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      12412
      0.000000
      0.500000
      0.030000
      0.000000
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      1.640000
      0.000000
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40 11
        12421 0.000000 0.500000 0.030000 0.000000 0.000000
40 11
        0.000001
40 11
0.000001
        0.000001
        13112 0.000000 0.100000 0.100000 0.000000 0.000000
        0.000001
                                                  0.000000
        40 11
        0.000001
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        13212 0.000000 0.100000 0.100000 0.000000 0.000000
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        0.000001
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        40 11
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    1.640000
    0.000000
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    1.640000
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    0.100000
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    0.000000
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    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    13322
    0.000000
    0.100000
    0.100000
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    1.640000
    0.000000
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    0.000000

0.000001
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        40 11
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0.000001
        0 000000
        0.000001
        13421 0.000000 0.100000 0.100000 0.000000 0.000000
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0.000001
        13422 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
0.000001
        13431 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
        0.000001
40 11
        40 11
0.000001
40 11
0.000001
        14131 0.000000 0.100000 0.100000 0.000000 0.000000
        0.000001
        14132 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
0.000001
        40 11
        14221 0.000000 0.100000 0.100000 0.000000 0.000000
        14222 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
        0.000001
40 11
40 11
        0.000001
40 11
        1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
        14322 0.000000 0.100000 0.100000 0.000000 0.000000
        0.000001
```

```
14331 0.000000 0.100000 0.100000 0.000000 0.000000
     0.000001
0.000001
     14421 0.000000 0.100000 0.100000 0.000000 0.000000
0.000001
     40 11
40 11
     40 11
     15121 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
0.000001
     40 11
0.000001
                                0.000000
     40 11
0.000001
     15132 0.000000 0.100000 0.100000 0.000000 0.000000
     0.000001
                                0.000000
     40 11
40 11
     0.000001
40 11
     15232 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
     0.000001
40 11
     0.000001
                                0.000000
     40 11
0.000001
40 11
0.000001
     0 000000
     0.000001
     15421 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
     0.000001
40 11
     15431 0.000000 0.100000 0.100000 0.000000 0.000000
40 11
     0.000001
40 11
     0.000001
     40 11
0.000001
40 12
     0.000001
                                0 000000
     0.000001
     3000 0.000000 0.108000 0.108000 0.000000 0.000000
40 12
0.000001
     4000 0.000000 0.432000 0.432000 0.000000 0.000000
40 12
0.000001
     5000 0.000000 0.378000 0.378000 0.000000 0.000000
40 12
     0.000001
     40 12
0.000001
40 12
     7000 0.000000 0.691200 0.691200 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      8000
      0.000000
      0.270000
      0.270000
      0.000000
      0.000000

0.000001
                                0.000000
40 12
     0.000001
     9000 0.000000 0.090000 0.090000 0.000000 0.000000
40 12
     0.000001
     40 12
0.000001
     11111 0.000000 0.010000 0.010000 0.000000 0.000000
     11112 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
     0.000001
40 12
     11122 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
     0.000001
40 12
     1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
     11212 0.000000 0.010000 0.010000 0.000000 0.000000
     1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
0.000001
```

```
11221 0.000000 0.010000 0.010000 0.000000 0.000000
     0.000001
0.000001
     11311 0.000000 0.010000 0.010000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.010000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.321
    0.000000
    0.010000
    0.010000
    0.000000

0.000001
40 12
0.000001
40 12
     0.000001
40 12
     11411 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
     0.000001
40 12
0.000001
     0.000001
     11422 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
     0.000001
                                   0.000000
     40 12
0.000001
40 12
     0.000001
40 12
     12122 0.000000 0.010000 0.010000 0.000000 0.000000
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     0.000001
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     0.000001
     40 12
0.000001
40 12
     0.000001
                                   0 000000
     0.000001
40 12
     0.000001
40 12
     12321 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
     0.000001
     40 12
0.000001
     40 12
0.000001
                                   0.000000
40 12
     0.000001
                                   0 000000
     0.000001
40 12
0.000001
     40 12
     13111 0.000000 0.010000 0.010000 0.000000 0.000000
0.000001
     13112 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
     0.000001
40 12
     40 12
0.000001
                                   0.000000
40 12
     0.000001
     13212 0.000000 0.010000 0.010000 0.000000 0.000000
     0.000001
     13221 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
0.000001
     40 12
     13222 0.000000 0.010000 0.010000 0.000000 0.000000
     13231 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
     0.000001
40 12
     13311 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
     0.000001
40 12
     1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
     13321 0.000000 0.010000 0.010000 0.000000 0.000000
     0.000001
```

```
13322 0.000000 0.010000 0.010000 0.000000 0.000000
       0.000001
0.000001
       13411 0.000000 0.010000 0.010000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.010000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

0.000001
40 12
0.000001
40 12
       0.000001
40 12
       13431 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
       0.000001
40 12
0.000001
       40 12
0.000001
       14122 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
       0.000001
                                              0.000000
       40 12
0.000001
40 12
       0.000001
40 12
       14222 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
       0.000001
40 12
       0.000001
                                              0.000000

    14232
    0.000000
    0.010000
    0.010000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    14321
    0.000000
    0.010000
    0.000000
    0.000000

40 12
0.000001
40 12
       0.000001
                                              0 000000
       0.000001
40 12
       0.000001
40 12
       14421 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
       0.000001
40 12
       0.000001

    14431
    0.000000
    0.010000
    0.010000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    14432
    0.000000
    0.010000
    0.010000
    0.000000

40 12
0.000001
40 12
       0.000001
                                              0 000000
       0.000001
       15122 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
0.000001
       40 12
       15131 0.000000 0.010000 0.010000 0.000000 0.000000
0.000001
       15132 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
       0.000001
40 12
       40 12
0.000001
                                              0.000000
40 12
       0.000001
       15232 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
       0.000001
       15321 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
0.000001
       40 12
       15322 0.000000 0.010000 0.010000 0.000000 0.000000
       15331 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
       0.000001
40 12
       15421 0.000000 0.010000 0.010000 0.000000 0.000000
40 12
       0.000001
40 12
       1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
       15431 0.000000 0.010000 0.010000 0.000000 0.000000
       1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000 \qquad 0.000000
0.000001
```

```
15432 0.000000 0.010000 0.010000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

0.000001
0.000001
             1000 0.000000 13.824000 13.824000 0.000000 0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    2000
    0.000000
    6.912000
    6.912000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    0.000000
    0.000000

    3000
    0.000000
    5.184000
    0.000000
    0.000000

0.000001
40 14
0.000001
40 14
             0.000001

      4000
      0.000000
      4.500000
      4.500000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000
      0.000000

      5000
      0.000000
      2.700000
      2.700000
      0.000000
      0.000000
      0.000000

40 14
40 14
            0.000001
40 14
0.000001
            40 14
0.000001
40 14
             0.000001
                                                                              0.000000
            40 14
0.000001
40 14
            0.000001
40 14
             11112 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
            1.640000 0.000000 0.000000 50.000000 0.000000 0.0
11121 0.000000 3.600000 3.600000 0.000000 0.000000
0.000001
40 14
             1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
            11122 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000
11211 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
0.000001
40 14
             1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                              0 000000
            40 14
0.000001
40 14
0.000001
40 14
             11311 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
             1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
            11312 0.000000 3.600000 3.600000 0.000000 0.000000 1.640000 0.000000 0.000000 50.000000 0.000000 0.
40 14
0.000001
                                                                              0.000000
            1.321 0.000000 3.600000 3.600000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000 0.0

1.322 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
0.000001
                                                                              0.000000
40 14
             1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                                                                              0 000000
            40 14
0.000001
40 14
0.000001
40 14
             11421 0.000000 3.600000 3.600000 0.000000 0.000000
             1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
             11422 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
             1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
            12111 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000 0.0
40 14
0.000001
            12112 0.000000 3.600000 3.600000 0.000000 0.000000

1.640000 0.000000 0.000000 50.000000 0.000000 0.0

12121 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
0.000001
                                                                              0.000000
40 14
0.000001
             1.640000 0.000000 0.000000 50.000000 0.000000
                                                                              0.000000
            0.000001
             12211 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
0.000001
             1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
40 14
             12212 0.000000 3.600000 3.600000 0.000000 0.000000
             1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
             12221 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
             1.640000 0.000000 0.000000 50.000000 0.000000
0.000001

      12222
      0.000000
      3.600000
      3.600000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      0.000000
      0.000000

40 14
             12311 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
            0.000001
40 14
             1.640000 \qquad 0.000000 \qquad 0.000000 \qquad 50.000000 \qquad 0.000000 \qquad 0.000000
0 000001
             12321 0.000000 3.600000 3.600000 0.000000 0.000000
            1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
```

```
12322 0.000000 3.600000 3.600000 0.000000 0.000000
                0.000001
0.000001
                 12412 0.000000 3.600000 3.600000 0.000000 0.000000
                 1.640000 0.000000 0.000000 50.000000 0.000000
0.000001
                 12421 0.000000 3.600000 3.600000 0.000000 0.000000
1.640000 0.000000 0.000000 50.000000 0.000000
12422 0.000000 3.600000 3.600000 0.000000 0.000000
40 14
0.000001
40 14

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

0.000001
40 14
40 14
                0.000001
40 14
0.000001
40 14
0.000001
40 14
                 13211 0.000000 0.720000 0.720000 0.000000 0.000000

    13212
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    13221
    0.000000
    0.720000
    0.720000
    0.000000
    0.000000

0.000001
40 14
0.000001
40 14

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.000000
    50.000000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000

    1.640000
    0.000000
    0.720000
    0.000000
    0.000000

0.000001
40 14
40 14
                 0.000001
40 14

      13232
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000
      0.000000

      1.3312
      0.000000
      0.720000
      0.720000
      0.000000
      0.000000
      0.000000

0.000001
40 14
0.000001
40 14
                0.000001
40 14
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                0.000001
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40 14
                 40 14
                0.000001
40 14
0.000001
40 14
0.000001
                                                                                                       0.000000
40 14
0.000001
                 1.640000 0.000000 0.000000 50.000000 0.000000
                 14222 0.000000 0.720000 0.720000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      14231
      0.000000
      0.720000
      0.000000
      0.000000

0.000001
40 14
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
40 14
                 14232 0.000000 0.720000 0.720000 0.000000 0.000000
                 40 14
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.0

14322 0.000000 0.720000 0.720000 0.000000 0.000000 0.0

1.640000 0.000000 0.000000 50.000000 0.000000 0.0

14331 0.000000 0.720000 0.720000 0.000000 0.000000
0.000001
40 14
40 14
                 0.000001
40 14
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
                 14421 0.000000 0.720000 0.720000 0.000000 0.000000
                 1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
0.000001
```

```
14422 0.000000 0.720000 0.720000 0.000000 0.000000

      1.640000
      0.000000
      0.000000
      50.000000
      0.000000
      0.000000

      1.4431
      0.000000
      0.720000
      0.000000
      0.000000
      0.000000

     0.000001
     40 14
               1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
     0.000001
                14432 0.000000 0.720000 0.720000 0.000000 0.000000
     40 14
     0.000001
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
                15121 0.000000 0.720000 0.720000 0.000000 0.000000
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
     0.000001
                15122 0.000000 0.720000 0.720000 0.000000 0.000000
     40 14
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
     0.000001
     40 14
                15131 0.000000 0.720000 0.720000 0.000000 0.000000
                1.640000 0.000000 0.000000 50.000000 0.000000
                15132 0.000000 0.720000 0.720000 0.000000 0.000000
     40 14
     0.000001
                1.640000 0.000000 0.000000 50.000000 0.000000
                15221 0.000000 0.720000 0.720000 0.000000 0.000000
     40 14
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
     0.000001
     40 14
                15222 0.000000 0.720000 0.720000 0.000000 0.000000
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
     0.000001
     40 14
                15231 0.000000 0.720000 0.720000 0.000000 0.000000
                1.640000 0.000000 0.000000 50.000000 0.000000
     0.000001
                                                                      0.000000
                15232 0.000000 0.720000 0.720000 0.000000 0.000000
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
     0.000001
                15321 0.000000 0.720000 0.720000 0.000000 0.000000
     40 14
                1.640000 0.000000 0.000000 50.000000 0.000000 0.000000
     0.000001
                15322 0.000000 0.720000 0.720000 0.000000 0.000000
     40 14
                1.640000 0.000000 0.000000 50.000000 0.000000
     40 14
                15331 0.000000 0.720000 0.720000 0.000000 0.000000
     0.000001
                1.640000 0.000000 0.000000 50.000000 0.000000
               15332 0.000000 0.720000 0.720000 0.000000 0.000000
     40 14
              1.640000 0.000000 0.000000 50.000000 0.000000
     0.000001
                                                                      0.000000
     c270 mon-accumulation rate (monaccum)
  only required if vgofg =1 (see card 255)
 defid parameter group id dwqid general quality id
 deluid landuse id
  jan-dec accumulation rate at start of each month (lb/acre/day)
c if in card 250, the unit is #/100ml, the above unit should be #/acre/day
c defid dwqid deluid jan feb mar apr may jun jul aug sep oct nov
C-----
c271 mon-storage limit of quality constituent (monsqolim)
  only required if vgofg = 1 (see card 255)
   defid parameter group id dwqid general quality id
   deluid landuse id
   jan-dec maximum storage at start of each month (lb/acre)
c if in card 250, the unit is #/100ml, the above unit should be #/acre
c defid dwqid deluid jan feb mar apr may jun jul aug sep oct nov
C-----
c272 mon-surfaceflow concentration (monsuroconc)
 only required if vsqcfg = 1 (see card 255)
   defid parameter group id dwqid general quality id
   deluid landuse id
   jan-dec concentration of constituent in surface flow at start of each month (mg/l), (ug/l), or (#/100ml)
c if in card 250, the unit is \#/100ml, the above unit should be \#/100ml
c defid dwqid deluid jan feb mar apr may jun jul aug sep oct nov
C-----
c273 mon-interflow concentration (moninterconc)
   only required if viqcfg = 1 (see card 255)
   defid parameter group id
   dwqid general quality id
```

С C

C

С

С

```
c deluid landuse id
    jan-dec concentration of constituent in interflow at start of each month (mg/l), (ug/l), or (#/100ml)
c if in card 250, the unit is #/100ml, the above unit should be #/100ml
C
c defid dwqid deluid jan feb mar apr may jun jul aug sep oct nov
                                                                               dec
C-----
c274 mon-groundwater concentration (mongrndconc)
   only required if vaqcfg = 1 (see card 255)
C
  defid parameter group id dwqid general quality id
C
С
c deluid landuse id
    jan-dec concentration of constituent in groundwater at start of each month (mg/l), (ug/l), or (#/100ml)
C
c if in card 250, the unit is \#/100ml, the above unit should be \#/100ml
C
c defid dwqid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c275 mon-atmospheric dry deposition flux
c only required if maddfglnd = 1 (see card 255)
C
c defid parameter group id
c dwqid general quality id
c deluid landuse id
   jan-dec flux of constituent in dry deposition at start of each month (lb/acre/day or #/acre/day)
C
С
c defid dwgid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c276 mon-atmospheric wet deposition concentration
c only required if mawdfglnd = 1 (see card 255)
c defid parameter group id c dwqid general quality id c deluid landuse id
   jan-dec concentration of constituent in atmospheric wet deposition at start of each month (mg/l), (ug/l),
C
or (#/100ml)
C
c defid dwqid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
C280 stream water quality control
C
    adfgrch if = 1 atmosperic deposition on reach (0 for no atmospheric deposition) maddfgrch if = 1 atmosperic dry deposition varies monthly on reach (card 282)
C
С
   mawdfgrch if = 1 atmosperic wet deposition varies monthly on reach (card 283)
C
C
c adfgrch maddfgrch mawdfgrch
0 0 0
C------
c281 general quality constituent control
C
C
    raid
           stream parameter group id
    dwqid general quality id
C
   gsdfg if = 0 no sediment associated gual
C
     if = 1 sediment associated in stream, adsorption/desorption of qual is simulated
С
   iniCond initial instream concentration at start of simulation by group (mg/l), (ug/l), or (#/100ml)
C
   decay general first-order instream loss rate of qual by reach group (1/day)
C
    tcdecay temperature correction coefficient for first-order decay of qual (min=1, max=2)
С
    addc atmospheric dry deposition flux (lb/acre/day or \#/acre/day) awdc atmospheric wet deposition concentration (mg/l), (ug/l), or (\#/100ml)
С
С
    potber scour potency pactor for stream bank erosion (lb or #)/ton-sediment
C
С
c rgid dwqid qsdfg iniCond decay tcdecay addc awdc potber
      33 3 0 0.000000 0.300000
                                                   1.000000
                                                                0.000000
                                                                              0.000000
      0.000000
      33 7
                          0.000000
                                      0.100000
                                                     1.000000
                                                                 0.000000
                  Ο
                                                                               0.000000
      0.000000
      33 10
                  0
                          0.000000
                                       0.100000
                                                     1.000000
                                                                 0.000000
                                                                               0.000000
      0.000000
      33 11
                          0.000000
                                      0.100000
                                                    1.000000
                                                                  0.000000
                                                                               0.000000
      0.000000
      33
            12
                   0
                          0.000000
                                       0.100000
                                                     1.000000
                                                                  0.000000
                                                                               0.000000
      0.000000
                  0
                          0.000000
                                       0.100000
                                                     1.000000
                                                                  0.000000
                                                                               0.000000
       33 14
      0.000000
                                                                  0.000000
      40 3
                   0
                          0.000000
                                       0.100000
                                                     1.000000
                                                                               0.000000
      0.000000
       40 7
                                                                 0.000000
                  Ο
                          0.000000
                                      0.100000
                                                    1.000000
                                                                               0.000000
       0.000000
       40 10
                  0
                                                                  0.000000
                          0.000000
                                       0.100000
                                                    1.000000
                                                                               0.000000
       0.000000
```

```
40
                              11
                                                              0.000000
                                                                                                 0.100000
                                                                                                                                    1.000000
                                                                                                                                                                    0.000000
                                                                                                                                                                                                      0.000000
                0.000000
                40 12
                                             0.000000
                                                                                                 0.100000
                                                                                                                                    1.000000
                                                                                                                                                                    0.000000
                                                                                                                                                                                                      0.000000
                0.000000
                40 14 0
                                                                  0.000000
                                                                                               0.100000
                                                                                                                                    1.000000
                                                                                                                                                                  0.00000
                                                                                                                                                                                                       0.000000
                0.000000
c282 mon-atmospheric dry deposition flux
          only required if maddfgrch = 1 (see card 280)
С
          rgid reach group id dwqid general quality id
С
C
          jan-dec flux of constituent in dry deposition at start of each month (lb/acre/day or #/acre/day)
C
c rgid dwqid jan feb mar apr may jun jul aug sep oct nov dec
c-----
c283 mon-atmospheric wet deposition concentration
C
         only required if mawdfgrch = 1 (see card 280)
C
        rgid reach group id dwqid general quality id
C
     rgid
С
          jan-dec concentration of constituent in atmospheric wet deposition at start of each month (mg/l), (ug/l),
C
or (#/100ml)
C
c rgid dwqid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c285 parameters for decay of contaminant adsorbed to sediment
         only required if qsdfg > 0 (see card 281)
C
                          reach group id
         rgid
С
          dwqid general quality id
addcpml decay rate for qual adsorbed to suspended sediment (/day)
C
C
           addcpm2 temperature correction coefficient for decay of qual on suspended sediment (range from 1.0 to
С
2.0)
           addcpm3 decay rate for qual adsorbed to bed sediment (/day)
С
           addcpm4 temperature correction coefficient for decay of qual on bed sediment (range from 1.0 to 2.0)
C
       С
C
C-----
c286 adsorption coefficients of qual
           only required if qsdfg > 0 (see card 281)
C
          rgid reach group id dwqid general quality id adpml distribution coefficients for qual with suspended sand (1/mg)
         rgid
С
С
          adpm2 distribution coefficients for qual with suspended silt (1/mg)
         adpm3 distribution coefficients for qual with suspended clay (1/mg) adpm4 distribution coefficients for qual with bed sand (1/mg)
С
         adpm5 distribution coefficients for qual with bed silt (1/mg)
C
С
         adpm6 distribution coefficients for qual with bed clay (1/mg)
С
        rgid dwqid adpm1 adpm2 adpm3 adpm4 adpm5
С
                                                                                                                             adpm6
             33 3 1.000e-10 1.000e-10 1.000e-10 1.000e-10 1.000e-10 1.000e-10 1.000e-10 33 10 1.000e-10 1.000e-10 1.000e-10 1.000e-10 1.000e-10 1.000e-10 33 11 1.000e-10 1.000e-10

      11
      1.000e-10
      <
                33
                33
40
                33
                40
                40
40
                40
                40
```

```
C
    rgid
             reach group id
С
    dwqid
             general quality id
              transfer rates between adsorbed and desorbed states of qual with suspended sand (/day)
С
    adpm1
              transfer rates between adsorbed and desorbed states of qual with suspended silt (/day)
              transfer rates between adsorbed and desorbed states of qual with suspended clay (/day)
С
    adpm3
              transfer rates between adsorbed and desorbed states of qual with bed sand (/day)
С
    adpm4
              transfer rates between adsorbed and desorbed states of qual with bed silt (/day)
С
    adpm5
    adpm6
              transfer rates between adsorbed and desorbed states of qual with bed clay (/day)
С
   rgid dwqid
С
                adpm1 adpm2
                               adpm3 adpm4
                                              adpm5
                                                     adpm6
                     0.000010
                                  0.000010
                                                 0.000010
                                                               0.000010
                                                                             0.000010
                                                                                           0.000010
                                                               0.000010
                                                                             0.000010
       33
              7
                     0.000010
                                  0.000010
                                                 0.000010
                                                                                           0.000010
       33
              10
                     0.000010
                                  0.000010
                                                 0.000010
                                                               0.000010
                                                                             0.000010
                                                                                           0.000010
                    0.000010
                                  0.000010
                                                0.000010
                                                               0.000010
                                                                            0.000010
       33
             11
                                                                                           0.000010
                                  0.000010
                                                               0.000010
       33
             12
                    0.000010
                                               0.000010
                                                                            0.000010
                                                                                           0.000010
       33
              14
                    0.000010
                                  0.000010
                                                0.000010
                                                               0.000010
                                                                             0.000010
                                                                                           0.000010
                   0.000010
                                  0.000010
                                                                            0.000010
       40
              3
                                                0.000010
                                                               0.000010
                                                                                           0.000010
       40
             7
                    0.000010
                                  0.000010
                                               0.000010
                                                               0.000010
                                                                            0.000010
                                                                                           0.000010
       40
             10
                     0.000010
                                  0.000010
                                                0.000010
                                                               0.000010
                                                                             0.000010
                                                                                           0.000010
       40
              11
                     0.000010
                                  0.000010
                                                 0.000010
                                                               0.000010
                                                                             0.000010
                                                                                           0.000010
       40
                     0.000010
                                  0.000010
                                                0.000010
                                                               0.000010
                                                                             0.000010
                                                                                           0.000010
             12
       40
             14
                    0.000010
                                  0.000010
                                                 0.000010
                                                               0.000010
                                                                            0.000010
                                                                                           0.000010
C-----
c288 adsorption/desorption temperature correction parameters
    only required if gsdfg > 0 (see card 281)
С
              reach group id
C
              general quality id
C
    dwaid
    adpm1
              temperature correction coefficients for adsorption/desorption on suspended sand (range from 1.0
С
to 2.0)
С
    adpm2
              temperature correction coefficients for adsorption/desorption on suspended silt (range from 1.0
to 2.0)
C
    adpm3
              temperature correction coefficients for adsorption/desorption on suspended clay (range from 1.0
to 2.0)
    adpm4
              temperature correction coefficients for adsorption/desorption on bed sand (range from 1.0 to 2.0)
C
    adpm5
              temperature correction coefficients for adsorption/desorption on bed silt (range from 1.0 to 2.0)
    adpm6
              temperature correction coefficients for adsorption/desorption on bed clay (range from 1.0 to 2.0)
C
С
C
   rgid dwgid
                adpm1 adpm2
                               adpm3 adpm4 adpm5
                                                     adpm6
                                  1.000000
                  1.000000
                                               1.000000
                                                               1.000000
       33
              3
                                                                             1.000000
                                                                                           1.000000
       33
              7
                     1.000000
                                   1.000000
                                                 1.000000
                                                               1.000000
                                                                             1.000000
                                                                                           1.000000
                                  1.000000
                                                               1.000000
                                                                            1.000000
       33
                    1.000000
                                                1.000000
                                                                                           1.000000
             10
       33
                   1.000000
                                  1.000000
                                                1.000000
                                                               1.000000
                                                                            1.000000
                                                                                           1.000000
                   1.000000
                                  1.000000
                                                 1.000000
                                                               1.000000
                                                                             1.000000
       33
                                                                                           1,000000
             12
       33
              14
                    1.000000
                                   1.000000
                                                 1.000000
                                                               1.000000
                                                                             1.000000
                                                                                           1.000000
                   1.000000
       40
              3
                                  1.000000
                                                1.000000
                                                               1.000000
                                                                             1.000000
                                                                                           1.000000
                                               1.000000
             7
                                  1.000000
                                                               1.000000
                                                                             1.000000
       40
                   1.000000
                                                                                           1.000000
                    1.000000
       40
             10
                                   1.000000
                                                 1.000000
                                                               1.000000
                                                                             1.000000
                                                                                           1.000000
       40
                   1.000000
             11
                                  1.000000
                                                 1.000000
                                                               1.000000
                                                                             1.000000
                                                                                           1.000000
       40
             12
                   1.000000
                                  1.000000
                                                1.000000
                                                              1.000000
                                                                             1.000000
                                                                                           1.000000
       40
             14
                    1.000000
                                  1.000000
                                                 1.000000
                                                               1.000000
                                                                             1.000000
                                                                                           1.000000
C-----
c289 initial concentrations on sediment
    only required if qsdfg > 0 (see card 281)
С
             reach group id
C
             general quality id
             initial concentrations of qual on suspended sand (concu/mg)
    sgal1
C
              initial concentrations of qual on suspended silt (concu/mg)
    sgal3
             initial concentrations of qual on suspended clay (concu/mg)
С
    sqal4
             initial concentrations of qual on bed sand (concu/mg)
С
              initial concentrations of qual on bed silt (concu/mg)
С
    sqal5
             initial concentrations of qual on bed clay (concu/mg)
С
    sqal6
С
   raid dwaid
                sqall sqal2
                               sqal3 sqal4
                                              sqal5 sqal6
                                0.000000
             3
                    0.000000
                                                 0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
       33
       33
              7
                     0.000000
                                  0.000000
                                                 0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
       33
             10
                     0.000000
                                  0.000000
                                                 0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
       33
              11
                     0.000000
                                   0.000000
                                                 0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
                     0.000000
                                   0.000000
                                                 0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
       33
              12
                                  0.000000
                     0.000000
                                                               0.000000
       33
                                                 0.000000
                                                                             0.000000
                                                                                           0.000000
             3
7
       40
                     0.000000
                                  0.000000
                                                0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
       40
                    0.000000
                                  0.000000
                                                0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
       40
             10
                   0.000000
                                  0.000000
                                                0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
                   0.000000
       40
            11
                                  0.000000
                                                 0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
       40
             12
                     0.000000
                                  0.000000
                                                 0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
       40
             14
                    0.000000
                                  0.000000
                                                 0.000000
                                                               0.000000
                                                                             0.000000
                                                                                           0.000000
```

```
C
           advection method (1 for dynamic mixing same as in HSPF and 2 for static mixing)
            crop factor associated with PEVT (used to back-calculate EVAP; EVAP = PEVT/kc)
С
   sedber stream bank erosion sediment (1 for on and 0 for off) (if sedfg=1)
С
   vconfg a value of 1 for vconfg means that F(vol) (volume-dependent) outflow demand components are
multiplied by a factor which is allowed to vary through the year.
           These monthly adjustment factors are input in Table-type MON-CONVF in this section (card 401)
C
С
    mod kc sedber vconfg
1 8.5000000000000e-01 0 0
c admod
c401 monthly F(vol) adjustment factors
   only required if vconfg = 1 (see card 400)
C
  rgid stream parameter group id
C
    jan-dec F(vol) adjustment factors at the start of each month
С
c rgid jan feb mar apr may jun jul aug sep oct nov dec
C---
c405 channel routing network
C
    rchid
           reach id (same as subbasin id)
    control output control switch for the corresponding reach
C
            0 = will not write general output
С
            1 = will write general output
C
C
   NumOutlets number of downstream outlets
           downstream outlets DS1 Ds2 .... DSn
C
C
    rchid control NumOutlets DS1 DS2 ......
                                                     DSn
       6665
            1 1 0
       6671
             1
                     1
                           0
       6673
            1
                   1
       6674
            1
                   1
                           0
       6675
                   1
       6684
            1
       6839
            1
                   1
             1
1
                   1
1
       6844
       6850
       6856 1
                   1
                    1
       6859
             1
                           Ω
       6861
             1
                    1
                           0
C-----
c407 reach weather multiplier
    rchid
              reach id (same as subbasin id)
    premult multiplier for precipitation
С
    petmult multiplier for potential evapotranspiration
С
c rchid premult petmult
       6665 1.000000
                          1.000000
                         1.000000
1.000000
1.000000
1.000000
            1.000000
       6671
       6673
       6674 1.000000
       6675 1.000000
       6684
             1.000000
                           1.000000
            1.000000
                          1.000000
       6839
                        1.000000
1.000000
1.000000
1.000000
1.000000
       6844 1.000000
       6850 1.000000
6856 1.000000
       6859 1.000000
       6861 1.000000
c410 reach geometry information
    rchid reach/lake id (same as subbasin id)
C
            reach/lake group id
С
    trgid threshold reach/lake group id
C
            reach/lake flag (0 for reach otherwise lake)
            lake flag = 1 (rectangular weir for internal option)
С
            lake flag = 2 (triangular weir for internal option)
С
            lake flag = 11 (BMP with rectangular weir for internal option)
            lake flag = 12 (BMP with triangular weir for internal option)
    idepth reach/lake initial water depth (feet)
    length reach/lake length (miles)
    depth reach/lake bank full depth (feet)
    width
slope
С
           reach/lake bankfull width (feet)
           reach longitudinal slope
С
            reach Manning's roughness coefficient/lake weir width (ft)
    mann
```

c400 general channel information

```
reach ratio of bottom width to bank full width (bottom width = r1 * width)/lake orifice height (ft)
   r1
C
        reach side slope of flood plane/lake orifice diameter (ft)
  r2
С
           reach flood plane width factor (total width of flood plane = w1*Width)/lake median particle size
C
   w 1
diameter, db50 (ft)
   crat ratio of maximum velocity to mean velocity in the RCHRES cross-section under typical flow
conditions (greater than or equal to 1)
          weighting factor for hydraulic routing (calibration)
С
    {\tt gloss} \quad {\tt constant flow loss rate (e.g., infiltration, pumping [in / hr])}
C
    qloss_t flow loss target reach ID
   qloss_f flow loss water quality flag for target reach ID (0 - use the target reach instream concentration;
С
1 - use the source reach instream concentration)
c rchid rgid trgid lkfg idepth length depth width slope
                                                            mann r1 r2 w1 crrat ks
qloss qloss_t qloss_f
      6665 33 0
                                 3.710585
                                             3.279134
                                                           3.710585
                                                                       60.826032
                                                                                    0.003924
      0.020000
                   0.500000
                                0.500000
                                             1.500000
                                                           1.500000
                                                                       0.000000
                                                                                    0.000000
      0 0
6671 33
                  0 0
                                0.000000
                                              0.000000
                                                           0.000000
                                                                        0.000000
                                                                                      0.001000
      0.020000
                  0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                        0.000000
                                                                                      0.000000
      0 0
6673 33
             33
                                 1.351690
                                              2.270340
                                                           1.351690
                                                                         14.684861
                                                                                      0.005145
      0.020000
                   0.500000
                                 0.500000
                                              1.500000
                                                                        0.000000
                                                                                      0.000000
      0 6674
                                                           1.500000
                   0 0
             33
                                 0.000000
                                              0.000000
                                                           0.000000
                                                                        0.000000
                                                                                      0.001000
      0.020000
                   0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                        0.000000
                                                                                      0.000000
          0
                                                                        13.694059
      6675
            33
                   Ω
                         0
                                 1.289354
                                              4.503094
                                                           1.289354
                                                                                      0.009414
      0.020000
                   0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                         0.000000
                                                                                      0.000000
      0 0
                   0 0
      6684 40
                                 0.744742
                                              2.987388
                                                           0.744742
                                                                         6.338506
                                                                                      0.008740
                                                                        0.000000
      0.020000
                   0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                                      0.000000
      0 0
      6839 33
                                 0.000000
                                              0.000000
                                                           0.000000
                                                                         0.000000
                                                                                      0.001000
      0.020000
                  0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                        0.000000
                                                                                      0.000000
           0
      6844 40
                                 0.000000
                                              0.000000
                                                           0.000000
                                                                         0.000000
                                                                                      0.001000
                   0.500000
      0.020000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                         0.000000
                                                                                      0.000000
           0
      6850 33
                   0 0
                                 0.000000
                                              0.000000
                                                           0.000000
                                                                         0.000000
                                                                                      0.001000
      0.020000
                  0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                         0.000000
                                                                                      0.000000
      0 0
      6856
            40
                    0 0
                                 0.748022
                                              2.776538
                                                           0.748022
                                                                         6.377875
                                                                                      0.006990
                   0.500000
      0.020000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                         0.000000
                                                                                      0.000000
      0 6859
                   0 0
                                              0.000000
            33
                                 0.000000
                                                           0.000000
                                                                        0.000000
                                                                                      0.001000
      0.020000
                   0.500000
                                 0.500000
                                              1.500000
                                                           1.500000
                                                                        0.000000
                                                                                      0.000000
      0 0
                   0 0
                                 0.000000
                                              0.000000
                                                                        0.000000
      6861 40
                                                           0.000000
                                                                                      0.001000
      0.020000
                   0.500000
                                0.500000
                                              1.500000
                                                           1.500000
                                                                         0.000000
                                                                                      0.000000
      0 0
c413 Reach Cross-section Information
С
    rchid x1 y1 x2 y2...
C
  rchid reach id (same as subbasin id)
С
           distance from the left reach bank (ft)
С
           it should not be greater than bank full width in card 410 (ft)
           depth from the bank full reach segment (ft)
           it should not be greater than bank full depth in card 410 (ft)
C
С
C-----
c415 reach discharge-volume relationship
C
C
    rchid reach id
  depth water depth (feet)
   area water surface area (acres)
C
    vol
           water volume (ac-ft)
   disch(1, 2, 3, ....noutflows) outflows (cfs)
C
c rchid depth area vol disch1 disch2 ...... dischN
C-----
c420 general point source information
C
C
    nPtSource number of individual point sources
   nPtQuals number of point source quals
C
c nPtSource nPtQuals
     0
            Ω
```

```
c425 point source
   Qualindex point source qual index
С
     Qualname point source qual name
    Qualid
C
              point source qual id
    sqalfr point source sediment associated qual fraction (0-1)
C
C
c Qualindex Qualname qualid
C-
c430 point source withdrawal
    subbasin point source reach id
C
    permit point source permit pipe point source pipe
С
С
    wd_target point source withdrawal target reach id
C
C
c subbasin permit pipe wd_target
                                   _____
C-----
c435 linkage controls (optional)
С
                 reach id (same as subbasin id)
C
С
    out.let
                 outlet control switch for the corresponding reach
С
                 0 = will read input timeseries file
                     (rchid/outlet can be duplicated for multiple input files)
C
                 n = will write output timeseries file for outlet n.
    filepath
                the timeseries file path (continuous string without space)
C
С
c rchid
        outlet filepath
C---
c440 sediment parameters controls
C
            if crvfg = 1, erosion-related cover may vary throughout the year.
С
            values are supplied in Table-type MON-COVER (card 453)
C
     vsivfg if vsivfg = 1, the rate of net vertical sediment input may vary throughout the year.
C
            if vsivfg = 2, the vertical sediment input is added to the detached sediment storage only on days
C
when no rainfall occurred during the previous day.
            values are supplied in Table-type MON-NVSI (card 454)
С
     sandfg if sandfg = 0, the sand is not simulated.
C
С
            if sandfg = 1, the sand transport capacity is calculated using the Toffaleti method.
            if sandfg = 2, the sand transport capacity is calculated using the Colby method. if sandfg = 3, the sand transport capacity is calculated using the power function of velocity.
C
С
    sweepfg if sweepfg = 0, the street sweeping is not simulated.
C
            if sweepfg = 1, the street sweeping is applied to sediemnt only.
C
C
            if sweepfg = 2, the street sweeping is applied to sediment and general water quality constituents.
C
      g vsivfg sandfg sweepfg 0 0 3 0
c crvfg
                                ______
c445 street sweeping for sediment (read if sedfg = 1)
C
                 parameter group id
landuse id (impervious only)
C
С
    deluid
  deluid landuse id (i
deluname landuse name
    start_month start month of street sweeping requirement
C
   end_month end month of street sweeping requirement frequency days between street sweeping within the landuse (0 for no sweeping)
С
C
  percent_area fraction of land surface which is available for street sweeping (0 for no sweeping)
C
    effic_sand fraction of sand in solids storage that is available for removal by sweeping (0-1)
C
    effic_silt
С
                 fraction of silt in solids storage that is available for removal by sweeping (0-1)
  effic_clay fraction of clay in solids storage that is available for removal by sweeping (0-1)
C
C
c defid deluid deluname start_month end_month frequency percent_area effic_sand effic_silt
C-----
c446 street sweeping for GQual (read if sedfg = 1 and pgalfg = 1)
C
    defid
                 parameter group id
    deluid landuse id (impervious only) deluname landuse north
    deluid
C
С
    effic_GQual fraction of general water quality constituent in surface storage that is available for
removal by sweeping (0-1)
c defid deluid deluname effic_GQual1 effic_GQual2 ... effic_GQualn
c450 sediment parameter group 1 (read if sedfg =1)
    defid parameter group id
C
  deluid landuse id
C
    smpf supporting management practice factor
C
    krer
            coefficient in the soil detachment equation
            exponent in the soil detachment equation
```

```
affix
            fraction by which detached sediment storage decreases each day as a result of
С
             soil compaction. (/day)
C
С
             fraction of land surface which is shielded from rainfall erosion
            rate at which sediment enters detached storage from the atmosphere (lb/ac/day)
    nvsi
С
             negative value may be used to simulate removal by human activity or wind
С
    kser
             coefficient in the detached sediment washoff equation
С
С
     jser
             exponent in the detached sediment washoff equation
С
     kger
             coefficient in the matrix soil scour equation, which simulates gully erosion
             exponent in the matrix soil scour equation, which simulates gully erosion
     jger
     accsdp rate at which solids accumulate on the land surface (used in impervious land)
С
     remsdp fraction of solids storage which is removed each day when there is no runoff,
```

c for exam		erage which is r of street sweepi				
c c defid deluid smpf	krer jrer	affix cover	nvsi kser		jger accsdp	
33 1000	1.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.004000	0.050000	
33 2000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.003000	0.050000	
33 3000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.002000	0.050000	0.00000
33 4000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000 33 5000	1.800000	0.000000 0.000000	1.000000	0.003000	0.050000 0.000000	0.000000
0.200000	1.000000 1.80000	0.000000	0.000000 1.000000	0.001500	0.050000	0.00000
33 6000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.003000	0.050000	0.000000
33 7000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.004000	0.050000	0.000000
33 8000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.002500	0.050000	
33 9000	1.000000	0.000000	0.000000	0.00000	0.000000	0.000000
0.20000	1.800000	0.00000	1.000000	0.000200	0.050000	
33 10000	1.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.00000	1.800000	0.00000	1.000000	0.00000	0.000000	
33 11111	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 11112	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 11121	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 11122	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 11211	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0 000000
33 11212 0.200000	1.000000 2.000000	0.400000	2.000000	0.100000	0.900000	0.000000
33 11221	1.000000	0.000000 0.400000	1.000000 2.000000	0.000000 0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.00000	0.000000	0.000000
33 11222	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	0.000000
33 11311	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.20000	2.000000	0.000000	1.000000	0.00000	0.000000	
33 11312	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 11321	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 11322	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.000000	0.000000	
33 11411	1.000000	0.150000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 11412	1.000000	0.150000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0 000000
33 11421 0.350000	1.000000 2.000000	0.150000	2.000000 1.000000	0.100000 0.000000	0.920000	0.000000
33 11422	1.000000	0.000000 0.150000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	0.000000
33 12111	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0.000000
33 12112	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 12121	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 12122	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
33 12211	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.00000	0.000000	
33 12212	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	

33 12221	1.000000	0.400000	2.000000	0.100000	0.920000	0.00000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
33 12222	1.000000	0.400000	2.000000	0.100000	0.920000	0.00000
						0.00000
0.350000	2.000000	0.00000	1.000000	0.00000	0.00000	
33 12311	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 12312	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 12321	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.000000	0.000000	
33 12322	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
33 12411	1.000000		2.000000	0.100000		0.00000
		0.110000			0.900000	0.00000
0.200000	2.000000	0.00000	1.000000	0.000000	0.000000	
33 12412	1.000000	0.110000	2.000000	0.100000	0.900000	0.00000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 12421	1.000000	0.110000	2.000000	0.100000	0.920000	0.00000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
33 12422	1.000000	0.110000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.000000	0.000000	
33 13111	1.000000	0.150000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	0.00000
						0.00000
33 13112	1.000000	0.150000	2.000000	0.100000	0.800000	0.00000
0.200000	2.000000	1.500000	2.500000	0.00000	0.00000	
33 13121	1.000000	0.150000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13122	1.000000	0.150000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.00000	
33 13211	1.000000	0.200000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 13212	1.000000	0.200000	2.000000	0.100000	0.800000	0.00000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	0.00000
						0 000000
33 13221	1.000000	0.200000	2.000000	0.100000	0.500000	0.00000
0.350000	2.000000	1.500000	2.500000	0.00000	0.00000	
33 13222	1.000000	0.200000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13231	1.000000	0.200000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13232	1.000000	0.200000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13311	1.000000	0.180000	2.000000	0.100000	0.800000	0.00000
0.200000			2.500000			0.00000
	2.000000	1.500000		0.00000	0.000000	0 000000
33 13312	1.000000	0.180000	2.000000	0.100000	0.800000	0.00000
0.200000	2.000000	1.500000	2.500000	0.00000	0.00000	
33 13321	1.000000	0.180000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13322	1.000000	0.180000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.00000	
33 13331	1.000000	0.180000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13411	1.000000	0.220000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	0.00000
	1.000000	0.220000		0.100000	0.800000	0.00000
			2.000000			0.00000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 13421	1.000000	0.220000	2.000000	0.100000	0.500000	0.00000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	
33 13422	1.000000	0.220000	2.00000	0.100000	0.500000	0.00000
0.350000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13431	1.000000	0.220000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 13432	1.000000	0.220000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.00000	0.000000	
33 14121	1.000000	0.225000	2.000000	0.100000	0.700000	0.00000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	0.00000
						0 000000
33 14122	1.000000	0.225000	2.000000	0.100000	0.700000	0.00000
0.350000	2.000000	0.750000	2.500000	0.00000	0.000000	
33 14131	1.000000	0.225000	2.000000	0.100000	0.900000	0.00000
0.500000	2.000000	0.750000	2.500000	0.00000	0.00000	
33 14132	1.000000	0.225000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.750000	2.500000	0.00000	0.00000	
33 14221	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.00000	0.00000	
33 14222	1.000000	0.330000	2.000000	0.100000	0.700000	0.00000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	3.00000
33 14231	1.000000	0.750000	2.000000	0.100000	0.800000	0.00000
						0.000000
0.500000	2.000000	0.750000	2.500000	0.00000	0.000000	0 000000
33 14232	1.000000	0.330000	2.000000	0.100000	0.800000	0.00000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	

33 14321	1.000000	0.405000	2.000000	0.100000	0.70000	0.000000
0.350000	2.000000	0.750000	2.500000	0.00000	0.00000	
33 14322	1.000000	0.405000	2.000000	0.100000	0.70000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 14331	1.000000	0.405000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.00000	0.000000	
33 14332	1.000000	0.405000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.00000	0.000000	
33 14421	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 14422	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	0.00000
33 14431	1.000000	0.330000	2.000000	0.100000	0.600000	0.000000
						0.00000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	0 00000
33 14432	1.000000	0.330000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
33 15121	1.000000	0.075000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.00000	0.000000	
33 15122	1.000000	0.075000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.00000	0.000000	
33 15131	1.000000	0.075000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	
33 15132	1.000000	0.075000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.375000				0.000000
			2.500000	0.000000	0.000000	0 000000
33 15221	1.000000	0.110000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.00000	0.00000	
33 15222	1.000000	0.110000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.00000	0.000000	
33 15231	1.000000	0.110000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.375000	2.500000	0.00000	0.000000	
33 15232	1.000000	0.110000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	
33 15321	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.000000	0.00000
						0 000000
33 15322	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.00000	0.00000	
33 15331	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.500000	2.000000	0.375000	2.500000	0.00000	0.000000	
33 15332	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.500000	2.000000	0.375000	2.500000	0.00000	0.000000	
33 15421	1.000000	0.011000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.075000	2.500000	0.000000	0.000000	
33 15422	1.000000	0.011000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.075000	2.500000	0.000000	0.000000	0.00000
33 15431	1.000000	0.011000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.075000	2.500000	0.000000	0.000000	0.000000
						0 000000
33 15432	1.000000	0.011000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.075000	2.500000	0.000000	0.000000	
33 16000	1.000000	0.000000	2.000000	0.100000	0.000000	0.000000
0.000000	2.000000	0.000000	1.000000	0.000000	0.000000	
40 1000	1.000000	0.000000	0.00000	0.000000	0.000000	0.000000
0.200000	1.800000	0.00000	1.000000	0.004000	0.050000	
40 2000	1.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.200000	1.800000	0.00000	1.000000	0.003000	0.050000	
40 3000	1.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.00000	1.000000	0.002000	0.050000	
40 4000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.003000	0.050000	0.00000
40 5000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000						0.00000
	1.800000	0.000000	1.000000	0.001500	0.050000	
40 6000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.003000	0.050000	
40 7000	1.000000	0.00000	0.000000	0.000000	0.000000	0.000000
0.200000	1.800000	0.00000	1.000000	0.004000	0.050000	
40 8000	1.000000	0.00000	0.000000	0.00000	0.000000	0.000000
0.200000	1.800000	0.000000	1.000000	0.002500	0.050000	
40 9000	1.000000	0.00000	0.000000	0.000000	0.00000	0.000000
0.200000	1.800000	0.000000	1.000000	0.000200	0.050000	
40 10000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000000	1.800000	0.000000	1.000000	0.000000	0.000000	2.00000
40 11111	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
						0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0 000000
40 11112	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.00000	
40 11121	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	
40 11122	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.000000	0.00000	

40 11211	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11212	1.000000	0.40000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11221	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11222	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.000000	0.000000	0.00000
						0.000000
40 11311	1.000000	0.250000	2.000000	0.100000	0.900000	0.00000
0.200000	2.000000	0.00000	1.000000	0.000000	0.000000	
40 11312	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11321	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11322	1.000000	0.250000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11411	1.000000	0.150000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
						0 000000
40 11412	1.000000	0.150000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.000000	0.000000	
40 11421	1.000000	0.150000	2.000000	0.100000	0.920000	0.00000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 11422	1.000000	0.150000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12111	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
						0 00000
40 12112	1.000000	0.200000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.00000	
40 12121	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12122	1.000000	0.200000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12211	1.000000	0.40000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.000000	0.000000	
40 12212	1.000000	0.400000	2.000000	0.100000	0.900000	0.000000
						0.00000
0.200000	2.000000	0.00000	1.000000	0.000000	0.000000	
40 12221	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.000000	0.000000	
40 12222	1.000000	0.400000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12311	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12312	1.000000	0.250000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
						0.000000
40 12321	1.000000	0.250000	2.000000	0.100000	0.920000	0.00000
0.350000	2.000000	0.00000	1.000000	0.000000	0.000000	
40 12322	1.000000	0.250000	2.000000	0.100000	0.920000	0.00000
0.350000	2.000000	0.00000	1.000000	0.00000	0.00000	
40 12411	1.000000	0.110000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.00000	1.000000	0.00000	0.000000	
40 12412	1.000000	0.110000	2.000000	0.100000	0.900000	0.000000
0.200000	2.000000	0.000000	1.000000	0.00000	0.000000	
40 12421	1.000000	0.110000	2.000000	0.100000	0.920000	0.000000
0.350000	2.000000	0.000000	1.000000	0.000000	0.000000	0.00000
	1.000000	0.110000	2.000000	0.100000	0.920000	0.000000
						0.00000
0.350000	2.000000	0.00000	1.000000	0.000000	0.000000	0 000000
40 13111	1.000000	0.150000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.00000	
40 13112	1.000000	0.150000	2.000000	0.100000	0.800000	0.00000
0.200000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13121	1.000000	0.150000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13122	1.000000	0.150000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	0.00000
						0 00000
40 13211	1.000000	0.200000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.00000	
40 13212	1.000000	0.200000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13221	1.000000	0.200000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13222	1.000000	0.200000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13231	1.000000	0.200000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.00000	0.000000	3.00000
						0 000000
40 13232	1.000000	0.200000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13311	1.000000	0.180000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.00000	

40 13312	1.000000	0.180000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13321	1.000000	0.180000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13322	1.000000	0.180000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	0.00000
40 13331	1.000000	0.180000	2.000000	0.100000	0.300000	0.000000
						0.00000
0.500000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13411	1.000000	0.220000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13412	1.000000	0.220000	2.000000	0.100000	0.800000	0.000000
0.200000	2.000000	1.500000	2.500000	0.00000	0.000000	
40 13421	1.000000	0.220000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13422	1.000000	0.220000	2.000000	0.100000	0.500000	0.000000
0.350000	2.000000	1.500000	2.500000	0.000000	0.000000	0.00000
40 13431	1.000000	0.220000	2.000000	0.100000	0.300000	0.000000
						0.00000
0.500000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 13432	1.000000	0.220000	2.000000	0.100000	0.300000	0.000000
0.500000	2.000000	1.500000	2.500000	0.000000	0.000000	
40 14121	1.000000	0.225000	2.000000	0.100000	0.70000	0.000000
0.350000	2.000000	0.750000	2.500000	0.00000	0.000000	
40 14122	1.000000	0.225000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14131	1.000000	0.225000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	0.00000
40 14132	1.000000	0.225000	2.000000	0.100000	0.900000	0.000000
						0.00000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14221	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.00000	
40 14222	1.000000	0.330000	2.000000	0.100000	0.70000	0.000000
0.350000	2.000000	0.750000	2.500000	0.00000	0.000000	
40 14231	1.000000	0.330000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14232	1.000000	0.330000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14321	1.000000	0.405000	2.000000	0.100000	0.700000	0.000000
						0.00000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	0 000000
40 14322	1.000000	0.405000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14331	1.000000	0.405000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.00000	0.000000	
40 14332	1.000000	0.405000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.00000	0.000000	
40 14421	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14422	1.000000	0.330000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.750000	2.500000	0.000000	0.000000	0.00000
					0.600000	0 000000
40 14431	1.000000	0.330000	2.000000	0.100000		0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 14432	1.000000	0.330000	2.000000	0.100000	0.600000	0.000000
0.500000	2.000000	0.750000	2.500000	0.000000	0.000000	
40 15121	1.000000	0.075000	2.000000	0.100000	0.70000	0.000000
0.350000	2.000000	0.375000	2.500000	0.00000	0.000000	
40 15122	1.000000	0.075000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15131	1.000000	0.075000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.00000	
40 15132	1.000000	0.075000	2.000000	0.100000	0.900000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	0.00000
40 15221	1.000000	0.110000	2.000000	0.100000	0.700000	0.000000
0.350000			2.500000			0.00000
	2.000000	0.375000		0.000000	0.000000	0 000000
40 15222	1.000000	0.110000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15231	1.000000	0.110000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15232	1.000000	0.110000	2.000000	0.100000	0.800000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15321	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15322	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.375000	2.500000	0.000000	0.00000	2.00000
						0.000000
	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	0 000000
40 15332	1.000000	0.135000	2.000000	0.100000	0.700000	0.000000
0.500000	2.000000	0.375000	2.500000	0.000000	0.000000	
40 15421	1.000000	0.011000	2.000000	0.100000	0.700000	0.000000
0.350000	2.000000	0.075000	2.500000	0.000000	0.000000	

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C-----
c451 sediment parameter group 2 (read if sedfg =1)
C
              parameter group id
C
     deluid
               landuse id
C
     sed-suro
              background concentration associated with surface flow (mg/l)
C
     sed-ifwo background concentration associated with interflow outflow (mg/l)
C
     sed-agwo background concentration associated with groundwater outflow (mg/l)
C
               fraction of sediment class_i (sand, silt, and clay)
C
C
     (sand + silt + clay = 1)
C
С
     Background sediment load is added to total sediment from LAND prior to applying fractions
С
                                                     sed_1 sed_2
                                        sed_agwo
                                                                    sed_3 ....sed_n
c defid
         deluid
                    sed_suro sed_ifwo
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33	13411	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	13412	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	13421	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	13422	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	13431	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	13432	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	14121	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	14122	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	14131	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	14132	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	14221	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	14222						
		0.00000	1.000000	1.000000	0.200000	0.650000	0.150000
33	14231	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	14232	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	14321	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	14322	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	14331	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	14332	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	14421	0.00000	1.000000	1.000000	0.600000	0.200000	0.200000
33	14422	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	14431	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	14432	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	15121	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	15122	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	15131	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	15132	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
33	15221	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	15222	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	15231	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	15232	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
33	15321	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	15322	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33	15331	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
33							
	15332	0.00000	1.000000	1.000000	0.500000	0.200000	0.300000
33	15421	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	15422	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	15431	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	15432	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
33	16000	0.000000	0.000000	0.00000	0.000000	0.000000	0.00000
40	1000	0.000000	0.000000	0.00000	0.100000	0.70000	0.200000
40	2000	0.000000	0.000000	0.00000	0.100000	0.700000	0.200000
40	3000	0.000000	0.000000	0.000000	0.100000	0.700000	0.200000
			0.000000				0.200000
40	4000	0.00000		0.00000	0.100000	0.70000	
40	5000	0.000000	0.000000	0.000000	0.100000	0.700000	0.200000
40	6000	0.000000	0.00000	0.00000	0.100000	0.700000	0.200000
40	7000	0.000000	0.000000	0.000000	0.100000	0.700000	0.200000
40	8000	0.000000	0.000000	0.000000	0.100000	0.700000	0.200000
40	9000	0.000000	0.000000	0.000000	0.100000	0.700000	0.200000
40	10000	150.000000	0.000000	0.00000	0.100000	0.700000	0.200000
40	11111	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	11112	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	11121	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	11122	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	11211	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	11212	0.00000	1.000000	1.000000	0.200000	0.650000	0.150000
40	11221	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	11222	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	11311	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
40	11312	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
40	11321	0.00000	1.000000	1.000000	0.500000	0.200000	0.300000
40	11322	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
40	11411	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
40	11412	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
40	11421	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
40	11422	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
40	12111	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	12112	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	12121	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	12122	0.000000	1.000000	1.000000	0.700000	0.100000	0.200000
40	12211	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	12212	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	12221	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	12222	0.000000	1.000000	1.000000	0.200000	0.650000	0.150000
40	12311	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
40	12312	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
40	12321	0.00000	1.000000	1.000000	0.500000	0.200000	0.300000
40	12322	0.000000	1.000000	1.000000	0.500000	0.200000	0.300000
40	12411	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
40	12412	0.000000	1.000000	1.000000	0.600000	0.200000	0.200000
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C-----
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c452 GQUAL-sediment to stream mapping (read if sediment as gqual)
    defid parameter group id
  dwgid general quality id
C
 lutype landuse type flow id (1 = impervious surfaceflow,
          2 = pervious surfaceflow, 3 = pervious interflow, 4 = pervious groundflow)
C
    sed_i fraction of sediment class_i (sand, silt, and clay)
С
c defid dwqid lutype sed_1 sed_2 sed_3 .....sed_n
c453 monthly erosion-related cover values
 only required if crvfg = 1 (see card 440)
C
   defid parameter group id
C
c deluid landuse id
   jan-dec erosion-related cover values at start of each month
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c454 monthly net vertical sediment input
c only required if vsivfg = 1 (see card 440)
```

```
defid parameter group id
C
     deluid landuse id
C
     jan-dec net vertical sediment input at start of each month (lb/acre/day)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c455 sediment general parameters group 3 (read if sedfg = 1)
    general sediment related parameters for instream transport
C
C
              stream parameter group id
    bedwid bed width (ft) - this is constant for the entire simulation period
С
c beddep initial bed depth (ft)
    por porosity burial burial rate of aggregated sediment layer (in/day)
c por
C
             if burial = 0 then burial rate in card 456 is used
C
C
c rgid bedwid beddep por burial

      33
      16.000000
      0.250000
      0.500000
      0.000000

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      16.000000
      0.250000
      0.500000
      0.000000

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c456 sediment parameters group 4 (read if sedfg = 1)
    cohesive suspended sediment variables for instream transport
C
c rgid stream parameter group id
c sed_id sediment class id
c sedflg sediment flag indicating sediment class (0 for sand, 1 for silt, and 2 for clay)
c sedo initial sediment conc in fluid phase (mg/liter)
c sedfrac initial sediment fractions (by weight) in the bed material
c db50/d median diameter of the non-cohesive sediment (sand) (in) (sandfg = 1 or 2)
С
                    / effective diameter of the cohesive particles (silt and clay) (in)
С
                    corresponding fall velocity of the particle in still water (in/s)
                    density of the particles (gm/cm^3)
C
    ksand/taucd
                    coefficient in the sandload power function formula (sandfg = 3)
С
                    / critical bed shear stress for deposition of the cohesive particle - generally taucd <=
С
taucs (lb/ft^2)
                    if tau > taucd then no deposition
                    if tau < taucd then deposition rate approaches settling velocity, w
C
С
     expsnd/taucs
                    exponent in the sandload power function formula (sandfg = 3)
C
                     / critical bed shear stress for scour of the cohesive particle (lb/ft^2)
                     if tau < taucs then no scour
С
C
                     if tau > taucs then scour steadily increases
                    erodibility coefficient of the cohesive particle (lb/ft^2/day)
С
                    burial rate of the sediment particle (in/day)
                    it is used if burial rate in card 455 is zero
С
С
c rgid sed_id sedflg sedo sedfrac db50/d w rho ksand/taucd expsnd/taucs m burial
       33 1 0 0.000000 0.100000 0.010000 0.800000 0.100000 0.000000
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c457 Streambank erosion sediment parameters (read if sedfg = 1 and sedber = 1)
C
     rchid reach id
С
   lber erodible stream length (miles)
    kber
            coefficient for scour of the bank matrix soil (calibration)
C
             exponent for scour of the bank matrix soil (calibration)
С
    iber
    qber bank erosion flow threshold causing channel bank soil erosion (cfs)
C
             if = negative then threshold flow is at the bank full depth (cfs)
   potNH4 particulate NH4-N bank erosion potency factor for RQUAL (lb/ton-sediment)
C
     potPO4 particulate PO4-P bank erosion potency factor for RQUAL (lb/ton-sediment)
С
    sed_i fraction of sediment class_i (sand, silt, and clay)
C
c rchid lber kber jber qber potNH4 potPO4 sed_1 sed_2 sed_3 ....sed_n
C-----
c460 soil temperature control (read if tempfg = 1)
C
     msltfg if = 1 monthly vary aslt and bslt parameters in surface flow temperature calculation
С
     miftfg if = 1 monthly vary aift and bift parameters in interflow temperature calculation
```

```
mgwtfg if = 1 monthly vary agwt and bgwt parameters in ground water temperature calculation
C
c msltfg
         miftfg
                    mawtfa
C-----
                                     _____
c461 Soil Temperature (read if tempfg =1)
C
С
           parameter group id
   deluid landuse id
C
  tsopfg if = 0 compute subsurface temperatures using a mean departure from air temperature plus a smoothing
factor
C
           if = 1 compute subsurface temperature using regression
           if = 2 the lower/gw layer temperature is a function of upper layer temperature instead of air
C
temperature
   aslt
           surface layer temperature when the air temperature 0 degrees C
C
   bslt
           slope of the surface layer temperature regression equation
C
  aift
           mean difference between interflow temperature and air temperature (C)
С
C
   bift
           smoothing factor in the interflow temperature calculation
С
   agwt
           mean difference between groundwater temperature and air temperature (C)
  bgwt
          smoothing factor in the groundwater temperature calculation
C
C
  islt
         initial surface flow temperature (C)
           initial interflow temperature (C)
С
    iift
         initial groundwater temperature (C)
   igwt
C
С
           y = a + b * x
C
c defid deluid tsopfg aslt bslt aift bift agwt bgwt islt iift igwt
C-----
c462 mon-aslt
   only required if tempfg = 1 and msltfg = 1 (see card 460)
C
C
  defid parameter group id
С
   deluid landuse id
C
    jan-dec surface layer temperature when the air temperature 0 degrees C at start of each month (C)
C
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C---
c463 mon-bslt
   only required if tempfg = 1 and msltfg = 1 (see card 460)
C
С
   defid parameter group id
  deluid landuse id
C
C
   jan-dec slope of the surface layer temperature regression equation at start of each month
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c464 mon-aift
C
   only required if tempfg = 1 and miftfg = 1 (see card 460)
C
c defid parameter group id
c deluid landuse id
    jan-dec mean difference between interflow temperature and air temperature at start of each month (C)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c465 mon-bift
   only required if tempfg = 1 and miftfg = 1 (see card 460)
C
C
С
   defid parameter group id
 deluid landuse id
C
   jan-dec smoothing factor in the interflow temperature calculation at start of each month
C
С
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c466 mon-agwt
   only required if tempfg = 1 and mgwtfg = 1 (see card 460)
C
    defid parameter group id deluid landuse id
C
   defid
С
C
    jan-dec mean difference between groundwater temperature and air temperature at start of each month (C)
                             apr may jun jul aug sep oct nov dec
c defid deluid jan feb mar
C-----
c467 mon-bowt
   only required if tempfg = 1 and mgwtfg = 1 (see card 460)
C
  defid parameter group id
C
    deluid landuse id
   jan-dec smoothing factor in the groundwater temperature calculation at start of each month
C
c defid deluid jan feb mar
                             apr may
                                        jun jul aug sep oct nov dec
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c470 Temperature Parameters for Land Groups (read if tempfg =1)
C
С
    subbasin
              subbasin id
             the mean watershed elevation (ft)
С
             difference in elevation between watershed and the air temperature gage (ft)
С
  eldat
               the mean RCHRES elevation (ft)
С
    rmelev
    reldat.
              difference in elevation between the RCHRES and the air temperature gage (ft)
C
              (positive if RCHRES is higher than the gage).
C
c subbasin melev eldat rmelev reldat
c474 24-hourly dry lapse rates (read if tempfg = 1)
    12AM-11PM lapse_rate - dry period lapse rate varying between 0.0035 to 0.005 (degree F/ft)
C
С
C
   12AM
         1AM
               2AM 3AM 4AM 5AM 6AM 7AM 8AM 9AM 10AM 11AM 12PM 1PM 2PM
                                                                                      3PM
                                                                                            4 PM
                                                                                                  5PM
6PM 7PM 8PM 9PM 10PM 11PM
C----
c475 Temperature Parameters for Stream Groups (read if tempfg =1)
C
C
           stream parameters group id
  cfsaex correction factor for solar radiation; fraction of RCHRES surface exposed to radiation
   katrad longwave radiation coefficient
C
   kcond conduction-convection heat transport coefficient
С
  kevap evaporation coefficient
C
C
c rgid cfsaex
               katrad
                          kcond
                                   kevap
C-----
c480 Bed Heat Conduction Parameters for Stream Groups (read if tempfg=1)
C
           stream parameters group id
С
    preflg flag for heat transfer rates for water surface (0 = off)
C
С
    bedflg bed conduction flag
С
           0 - bed conduction is not simulated
           1 - single interface (water-mud) heat transfer method
C
           2 - two-interface (water-mud and mud-ground) heat transfer method
           3 - Jobson method (not supported)
C
С
    tgflg
          source of the ground temperature for the bed conduction (used when bedflg is 1 or 2)
           1 - time series (not supported)
C
С
           2 - single value
C
           3 - monthly values (card 485)
   muddep depth of the mud layer in the two-interface model (bedflg = 2) (m)
C
С
   tgrnd constant (tgflg = 2) ground temperature (bedflg = 1 or 2) (degree C)
           heat conduction coefficient between water and the mud/ground (bedflg = 1 or 2) (kcal/m2/degC/hr)
C
    kgrnd heat conduction coefficient between ground and mud in the two-interface model (bedflg = 2)
C
(kcal/m2/deqC/hr)
c rgid preflg bedflg tgflg muddep tgrnd kmud kgrnd
               ._____
c485 monthly ground temperatures for bed heat conduction algorithms
   only required if tgflg = 3 (see card 480)
C
C
           stream parameter group id
C
C
   jan-dec tgrndm - monthly ground temperatures for use in the bed heat conduction models (degree C)
C
c rgid jan feb mar apr may jun jul aug sep oct nov dec
C--
c500 land to stream mapping (read if oxfg =1)
    deluid landuse id
C
С
    dwqid general quality id
    lutype landuse type flow id (1 = impervious surfaceflow,
C
           2 = pervious surfaceflow, 3 = pervious interflow, 4 = pervious groundflow)
С
C
          bod fraction in pqual
   nox
          nitrate fraction in pqual
C
           total ammonia fraction in pqual
C
C
   snh4 particulate NH4-N fraction in pqual
           ortho-phosphorus fraction in pqual
         particulate PO4-P fraction in pqual
С
   spo4
С
    orn
           organic-nitrogen fraction in pqual
   orp
           organic-phosphorus fraction in pqual
С
          organic-carbon fraction in pqual
C
   orc
c deluid dwqid lutype bod nox tam snh4 po4 spo4 orn orp orc
c501 atmosphere to stream mapping
C
    only required if adfgrch = 1 (see card 280)
```

```
C
    rgid
            stream parameter group ID
С
    dwqid
            general quality ID
С
    bod
            bod fraction in PQUAL
           nitrate fraction in PQUAL
C
    nox
С
    tam
           total ammonia fraction in PQUAL
С
    po4
           orthophosphate fraction in PQUAL
    orn
           organic-nitrogen fraction in PQUAL
C
          organic-phosphorus fraction in PQUAL
           organic-carbon fraction in PQUAL
С
С
c rgid dwqid bod nox tam po4 orn orp orc
C---
c502 gases control (read if oxfg =1)
C
    midofg if = 1 monthly very DO concentration in interflow
C
    mico2fg if = 1 monthly very CO2 concentration in interflow
    madofg if = 1 monthly very DO concentration in ground water
С
    maco2fg if = 1 monthly very CO2 concentration in ground water
С
С
                                   maco2fg
c midofq
           mico2fg
                       madofg
C-----
c503 DO-CO2 Control constant values (read if oxfg =1)
C
    defid
            parameter group id
С
  deluid landuse id
C
C
  sdoxp concentration of dissolved oxygen in surface flow (mg/l)
            concentration of dissolved CO2 in surface flow (mg/l)
С
   idoxp concentration of dissolved oxygen in interflow outflow (mg/l)
C
  ico2p concentration of dissolved CO2 in interflow outflow (mg/l)
   adoxp concentration of dissolved oxygen in active groundwater outflow (mg/l) aco2p concentration of dissolved CO2 in active groundwater outflow (mg/l)
C
C
c defid deluid sdoxp
                       sco2p
                                 idoxp ico2p adoxp aco2p
c504 mon-DO (interflow) mg C/l
    only required if oxfg = 1 and midofg = 1 (see card 502)
C
С
    defid parameter group id
   deluid landuse id
C
C
   jan-dec interflow dissolved oxygen concentration at start of each month (mg/l)
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c505 mon-DO (groundwater)
C
    only required if oxfg = 1 and madofg = 1 (see card 502)
C
c defid parameter group id
c deluid landuse id
C
    jan-dec groundwater dissolved oxygen concentration at start of each month (mg/l)
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c506 mon-CO2 (interflow) mg C/l
    only required if oxfg = 1 and mico2fg = 1 (see card 502)
C
C
С
    defid parameter group id
  deluid landuse id
C
    jan-dec interflow carbon dioxide concentration at start of each month (mg/l)
C
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
C-----
c507 mon-CO2 (groundwater)
    only required if oxfg = 1 and maco2fg = 1 (see card 502)
С
   defid parameter group id deluid landuse id
C
    jan-dec groundwater carbon dioxide concentration at start of each month (mg/l)
c defid deluid jan feb mar apr may jun jul aug sep oct nov dec
c510 DO/BOD control
C
    benrfg benthic release flag (for benthic related parameters)
    reamfg reaeration flag (indicates the method used to calculate the reaeration coefficient for free-flowing
C
streams)
c if = 1 then Tsivoglou method is used
    if = 2 then Owens, Churchill, or O'Connor-Dobbins method is used depending on velocity and depth of water
С
  if = 3 then Coefficient is calculated as a power function of velocity and/or depth
```

```
c benrfg
c511 ox-parm1
C
С
    raid
            stream parameter group id
     kbod20 bod decay rate at 20oC (1/hr)
С
    tcbod temperature adjustment coefficient for bod decay
C
c kodset bod settling rate (m/hr)
    supsat maximum allowable dissolved oxygen supersaturation (expressed as a multiple of the dissolved oxygen
C
saturation concentration)
   tcginv temperature correction coefficient for surface gas invasion
C
C
    reak empirical constant in the equation
            if reamfg = 1 then it is an escape coefficient (1/ft)
C
            if reamfg = 3 then it is used to calculate the reaeration coefficient (1/hr)
C
c expred exponent to depth in the reaeration coefficient equation (for reamfg = 3)
    exprev exponent to velocity in the reaeration coefficient equation (for reamfg = 3)
C
    cforea correction factor in the lake reaeration equation; it accounts for good or poor circulation
C
characteristics
C
c rgid kbod20 tcbod kodset supsat tcginv reak expred exprev cforea
c512 ox-parm2
C
    rgid
               stream parameter group id
С
c rgid stream parameter group id c benod benthal oxygen demand at 20 degrees C (with unlimited DO concentration) (mg/m2/hr)
c toben temperature correction coefficient for benthal oxygen demand c expod exponential factor in the dissolved oxygen term of the benthal c brbod benthal release rate of BOD under aerobic conditions.(mg/m2/hr)
               exponential factor in the dissolved oxygen term of the benthal oxygen demand equation
c brbod_inc increment to benthal release of BOD under anaerobic conditions. (mg/m2/hr)
    exprel the exponent in the DO term of the benthal BOD release equation
C
c rgid benod tcben expod brbod brbod_inc exprel
c513 oxrx-initial conditions
C
    rgid stream parameter group id
    dox DO initial condition. (mg/l) bod BOD initial condition in water
C
С
           BOD initial condition in water column. (mg/l)
   satdo Initial DO saturation concentration. (mg/l)
C
c rgid dox bod satdo
C-----
c514 ox-scour parms
C
C
    rgid stream parameter group id
    scrvel threshold velocity above which the effect of scouring on benthal release rates is considered. (m/s)
C
    scrmul multiplier by which benthal releases are increased during scouring.
C
C
c rgid scrvel scrmul
C-----
c520 nutrients control
С
   tamfg
            total ammonia flag
C
c no2fg nitrite flag
   po4fg ortho-phosphorus flag
amvfg ammonia volatilization
C
C
             ammonia volatilization flag
            denitrification flag
C
   denfq
  adnhfg NH4 adsorption flag
adpofg PO4 adsorption flag
mphfg monthly pH flag (not supported in this version)
C
С
C
c tamfg no2fg po4fg amvfg denfg adnhfg adpofg mphfg
                 ______
c521 nut-parm1
C
    rgid
             stream parameter group id
С
C
            conversion from milligrams biomass to milligrams oxygen (mg/mg)
c cvbpc
            conversion from biomass expressed as phosphorus to carbon (mols/mol)
    cvbpn
            conversion from biomass expressed as phosphorus to nitrogen (mols/mol)
С
    bpcntc percentage of biomass which is carbon (by weight)
С
    ktam20 nitrification rate of ammonia at 20 degrees C (1/hr)
    kno220 nitrification rate of nitrite at 20 degrees C (1/hr)
C
    tcnit
            temperature correction coefficient for nitrification
    kno320 nitrate denitrification rate at 20 degrees C (1/hr)
C
    tcden temperature correction coefficient for denitrification
    denoxt dissolved oxygen concentration threshold for denitrification (mg/l)
C
C
c rgid cvbo cvbpc cvbpn bpcntc ktam20 kno220 tcnit kno320 tcden denoxt
```

```
c522 nut-parm2
C
С
    rgid
                 stream parameter group id
    brtam_1
                 benthal release rate of ammonia under aerobic condition (mg/m2/hr)
С
С
    brtam 2
                 benthal release rates of ammonia under anaerobic conditions (mg/m2/hr)
С
    brpo4 1
                 benthal release rate of ortho-phosphorus under aerobic condition (mg/m2/hr)
                benthal release rate of ortho-phosphorus under anaerobic condition (mg/m2/hr)
    brpo4_2
С
               constant bed concentrations of ammonia-N adsorbed to sand, silt, and clay (mg/kg)
    bnh4(1-3)
    bpo4(1-3)
                constant bed concentrations of ortho-phosphorus-P adsorbed to sand, silt, and clay (mg/kg)
С
C
c rgid brtam_1 brtam_2 brpo4_1 brpo4_2 bnh4_1 bnh4_2 bnh4_3 bpo4_1 bpo4_2 bpo4_3
C---
c523 nut-parm3
C
    rgid
                 stream parameter group id
С
    anaer concentration of dissolved oxygen below which anaerobic conditions are assumed to exist (mg/l) adnhpm(1-3) adsorption coefficients (Kd) for ammonia-N adsorbed to sand, silt, and clay (cm3/g)
C
С
    adpopm(1-3) adsorption coefficients for ortho-phosphorus-P adsorbed to sand, silt, and clay (cm3/g)
С
С
    expnvq
              exponent in the gas layer mass transfer coefficient equation for NH3 volatilization
                 exponent in the liquid layer mass transfer coefficient equation for NH3 volatilization
С
    expnvl
C
c rgid anaer adnhpm_1 adnhpm_2 adnhpm_3 adpopm_1 adpopm_2 adpopm_3 expnvg expnvl
C-----
c524 nut-initial conditions
C
С
    rgid
               stream parameter group id
С
               initial concentration of nitrate (mg/l)
              initial concentration of total ammonia (mg/l)
C
    tam
  no2 initial concentration of nitrite (as N) (mg/l)
С
   po4
               initial concentration of ortho-phosphorus (as P) (mg/l)
C
    snh4(1-3) initial suspended concentrations of ammonia-N adsorbed to sand, silt, and clay (mg/kg)
С
    spo4(1-3) initial suspended concentrations of ortho-phosphorus-P adsorbed to sand, silt, and clay (mg/kg)
C
c rgid no3 tam no2 po4 snh4_1 snh4_2 snh4_3 spo4_1 spo4_2 spo4_3
c530 plank flags
C
С
    phyfg
             phytoplankton flag
    zoofa
             zooplankton flag
C
    sdltfg influence of sediment washload on light extinction flag amrfg ammonia retardation of pitrocare light.
С
  balfg
C
C
С
   decfg linkage between carbon dioxide and phytoplankton growth flag (if on, the linkage is decoupled)
            ammonia is included as part of available nitrogen supply in nitrogen limited growth calculations indicates the oref parameter in card 534 as a flowrate (if = 0) otherwise velocity
    nsfq
C
C
    orefq
C
c phyfg zoofg balfg sdltfg amrfg decfg nsfg orefg
C-
c531 plank-parm1
    raid
            stream parameter group id
C
    ratclp ratio of chlorophyll A content of biomass to phosphorus content
С
    nonref non-refractory fraction of algae and zooplankton biomass
С
    litsed multiplication factor to total sediment concentration to determine sediment contribution to light
C
extinction (1/mg/ft)
С
   alnpr fraction of nitrogen requirements for phytoplankton growth that is satisfied by nitrate
    extb base extinction coefficient for light (1/m)
C
    malgr maximum unit algal growth rate (1/hr)
C
c rgid ratclp nonref litsed alnpr extb
                                                  malqr
c532 plank-parm2
С
    rgid
C
             stream parameter group id
    cmmlt
            Michaelis-Menten constant for light limited growth (lay/min)
C
            nitrate Michaelis-Menten constant for nitrogen limited growth (mg/l)
С
    cmmnp nitrate Michaelis-Menten constant for phosphorus limited growth (mg/l)
C
    cmmp
            phosphate Michaelis-Menten constant for phosphorus limited growth (mg/l)
С
    talgrh temperature above which algal growth ceases (C)
С
    talgrl temperature below which algal growth ceases (C)
С
    talgrm temperature below which algal growth is retarded (C)
C
C
c rgid cmmlt cmmn cmmnp cmmp talgrh talgrl talgrm
C-----
c533 plank-parm3
C
С
     rgid stream parameter group id
     alr20 algal unit respiration rate at 20 degrees C (1/hr)
```

```
aldh high algal unit death rate (1/hr)
C
  aldl low algal unit death rate (1/hr)
С
   oxald increment to phytoplankton unit death rate due to anaerobic conditions (1/hr)
С
   naldh inorganic nitrogen concentration below which high algal death rate occurs (as nitrogen) (mg/l)
С
   paldh inorganic phosphorus concentration below which high algal death rate occurs (as phosphorus) (mg/l)
        alr20
                  aldh
c rgid
                           aldl
                                   oxald
                                            naldh
                                                     paldh
c534 plank-parm4
C
С
    rgid
           stream parameter group id
  phycon constant inflow concentration of plankton from land to reach (mg/l)
C
   seed minimum concentration of plankton not subject to advection (i.e., at high flow) (mg/l)
C
   mxstay concentration of plankton not subject to advection at very low flow (mg/l)
C
   oref
           velocity/outflow at which the concentration of plankton not subject to advection is midway between
C
SEED and MXSTAY, see card 530 (m/s or m3/s)
C
  claidh chlorophyll a concentration above which high algal death rate occurs (ug/l)
    physet phytoplankton settling rate (m/hr)
С
   refset settling rate for dead refractory organics (m/hr)
C
c cfsaex This factor is used to adjust the input solar radiation to make it applicable to the RCHRES;
          for example, to account for shading of the surface by trees or buildings
С
           maximum benthic algae density (as biomass) (mg/m2)
C
c cfbalr ratio of benthic algal to phytoplankton respiration rate
   cfbalg ratio of benthic algal to phytoplankton growth rate
C
С
c rgid phycon seed mxstay oref claldh physet refset cfsaex mbal cfbalr cfbalg
c535 plank-initial conditions
C
   rgid stream parameter group id
  phyto initial phytoplankton concentration, as biomass (mg/l)
C
   benal initial benthic algae density, as biomass (mg/m2)
  orn initial dead refractory organic nitrogen concentration (mg/l)
C
C
   orp
          initial dead refractory organic phosphorus concentration (mg/l)
C
   orc
         initial dead refractory organic carbon concentration (mg/l)
C
c rgid phyto benal orn orp orc
C-----
c540 pH controls
C
   phffgl value of 0 indicates that the removal factor for total inorganic carbon is constant, given as
C
phfrc1
c a value of 1 indicates the monthly removal factors
    phffg2 value of 0 indicates that the removal factor for dissolved carbon dioxide is constant, given as
phfrc2
C
            a value of 1 indicates the monthly removal factors
    phfrcl removal fraction for total inorganic carbon
С
С
    phfrc2 removal fraction for dissolved carbon dioxide
C
c phffgl phffg2 phfrcl phfrc2
C-----
c541 pH-parm
С
          stream parameter group id
C
c \, phont maximum number of iterations used to solve for the pH
C
   alkcon number of the conservative substance which is used to simulate alkalinity
          Alkalinity must be simulated in order to obtain valid results
C
c cfcinv ratio of the carbon dioxide invasion rate to the oxygen reaeration rate
   brco2_1 benthal release rate of CO2 (as carbon) for aerobic conditions (mg/m2/hr)
C
   brco2_2 benthal release rate of CO2 (as carbon) for anaerobic conditions (mg/m2/hr)
C
c rgid phcnt alkcon cfcinv brco2_1 brco2_2
C-----
c542 pH-initial conditions
    rgid stream parameter group id
C
    tic initial total inorganic carbon (mg/l)
С
   co2 initial carbon dioxide (as carbon) (mg/l)
С
   ph initial pH
C
c rgid tic co2 ph
                      -----
c543 mon-tic (monthly removal fraction for total inorganic carbon)
  only required if phfg = 1 and phffg1 = 1 (see card 502 and card 540)
C
    rgid stream parameter group id
   jan-dec total inorganic carbon removal fraction at the start of each month
C
c rgid jan feb mar apr may jun jul aug sep oct nov
```

```
c544 mon-co2 (monthly removal fraction for dissolved carbon dioxide)
C
    only required if phfq = 1 and phffq2 = 1 (see card 502 and card 540)
С
             stream parameter group id
С
    jan-dec dissolved carbon dioxide removal fraction at the start of each month
С
С
c rgid jan feb mar apr may jun jul aug sep oct nov dec
C------
c600 TMDL control flags
С
С
                if > 0 then use point sources control card 660
                if > 0 then use landuse control card 670
C
    ncland
                if = 1 then apply reduction to only surface output
С
                if = 2 then apply reduction to total land output
C
  ncrch
               if > 0 then use reach control card 685 and 690
С
С
    ntrgp
                number of threshold groups in Card 410 and 610
                number of defined thresholds for analysis
С
    ntnum
                if > 0 then use threshold control cards 605 and 610
С
С
   C-----
                           ______
c605 TMDL threshold mapping (used if ntnum > 0 in card 600)
С
                threshold ordinal number
C
С
     tasd
                threshold qual (1 for dissolved only and 2 for total)
                number of water quality constituent to aggregate
C
              list of tqid to aggregate - number of tqid in list = tcount (GQUAL/RQUAL IDs)
С
     tqid
С
    С
c610 TMDL threshold definitions (used if ntnum > 0 in card 600)
С
                threshold reach group ID (corresponds to trgid on Card 410)
     traid
С
С
     tnum
                threshold number (corresponds to tnum on Card 605)
                threshold type (possible values: 0, 1, 2, 3 or -1, -2, -3)
    ttype
C
С
                0 = no standard to be applied for the trgid
                1 = instantaneous values > threshold
C
С
                 2 = arithmetic mean > threshold
C
                 3 = geometric mean > threshold
                -1 = instantaneous values < threshold
C
С
                -2 = arithmetic mean < threshold
                -3 = geometric mean < threshold
C
C
     tdays
                number of days over model output is aggregated and/or is compared
                if tdays = 0 then threshold becomes percent of time
C
     jan-dec
С
                twelve monthly values for threshold (for constant, use same value 12 times)
С
                (units are same as in card 250)
С
     examples: ttype tdays description/interpretation
С
                      1 at least one instantaneous value within a 1-day running period > threshold
                  1
C
С
                         1 at least one instantaneous value within a 1-day running period < threshold
C
                         0 percent of time that instantaneous value > threshold
                   2
                         4 4-day running arithmetic mean > threshold
С
                         30 30-day running geometric mean > threshold (for previous 30-days)
C
С

    trgid
    tnum
    ttype
    tdays
    jan
    feb
    mar
    apr
    may
    jun
    jul
    aug
    sep
    oct
    nov

    1
    1
    1
    0
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000
    0.000000

    0.000000
    0.000000
    0.000000
    0.000000
    0.000000
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    0.000000

                                                                                                 0.000000
                                                                                                 0.000000
c660 TMDL point source control (used if ncpt > 0 on card 600)
C
    rchid
                  reach id
С
                 point source index (level1)
C
    pipe point source index qualifier (level2) reduction reduction of pollutant from point source (in fraction)
    pipe
C
С
C
   rchid permit pipe reduction_flow...reduction_qual1...reduction_qual2...reduction_qualn
C-
c670 TMDL land-based control (used if ncland > 0 on card 600)
С
     subbasin subwatershed id
C
    deluid land use name land use name
С
C
     reduction reduction of pollutant from corresponding landuse and subwatershed
С
c subbasin deluid pluname reduction
```

```
Road_Freeway-All-All-All
6665
      1000
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
                                                      0.000000
                                                                    0.000000
0.000000
             0.000000 0.000000
                                        0.000000
6665
      2000
             Road_Primary-All-All-All
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
             0.00000
                         0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
0.000000
             Road_Minor-All-All-All 0.000000
                                            0.000000
                                                         0.000000
                                                                         0.000000
      3000
0.000000
             0.000000
                          0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
6665
      4000
             Dev_ResHigh-All-All-All
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
0.000000
             0.000000 0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                               0.000000
                                                            0.000000
      5000
             Dev ResLow-All-All-All 0.000000
                                                                          0.000000
6665
                                        0.000000
                                                     0.000000
0.000000
             0.000000
                          0.000000
                                                                   0.000000
6665 6000
             Dev_Com-All-All 0.000000 0.000000 0.000000
                                                                          0.000000
0.000000
             0.000000
                       0.00000
                                        0.000000
                                                      0.000000
                                                                    0.000000
6665
      7000
             Dev Ind-All-All 0.000000 0.000000 0.000000
                                                                          0.000000
0.000000
             0.000000 0.000000 0.000000 0.000000
                                                                   0.000000
             Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
6665 8000
             0.000000 0.000000
                                        0.000000 0.000000 0.000000
0.000000
6665 9000
             Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
                                        0.000000
0.000000
             0.000000 0.000000
                                                     0.000000
                                                                   0.000000
                                                                    0.000000
6665 10000
                                        0.000000
                                                      0.000000
             Dev_Overspray-All-All-All
                                                                                 0.000000
                                                                    0.000000
             0.000000
                         0.000000
                                        0.000000
                                                      0.000000
0.000000
6665
    11111
             Dev_Irrigated-A-Low-Confined
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
0.000000
             0.000000 0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
             Dev_Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
6665
      11112
0.000000
             0.000000
                          0.000000
                                        0.000000
                                                     0.000000
                                                                   0.000000
                                                                                 0.000000
                                        0.000000
                                                      0.000000
6665 11121
             Dev_Irrigated-A-Med-Confined
                                                                    0.000000
                                                                                 0.000000
                                                      0.000000
0.000000
             0.000000
                         0.000000
                                                                    0.000000
                                        0.000000
6665 11122
                                           0.000000
                                                        0.000000 0.000000
             Dev_Irrigated-A-Med-Unconfined
0.000000
             0.000000
                         0.000000
                                        0.000000
                                                      0.000000
                                                                   0.000000
                                                                                 0.000000
6665 11211
             Dev_Irrigated-B-Low-Confined
                                       0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
0.000000
             0.000000
                         0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
6665 11212
             Dev Irrigated-B-Low-Unconfined
                                             0.000000
                                                         0.000000
                                                                        0.000000
                                        0.000000
0.000000
             0.000000
                          0.000000
                                                      0.000000
                                                                   0.000000
                                                                                 0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
6665 11221
             Dev_Irrigated-B-Med-Confined
                                                                                 0.000000
                                        0.000000
                                                                    0.000000
0.000000
                          0.000000
                                                      0.000000
             0 000000
6665 11222
             Dev_Irrigated-B-Med-Unconfined 0.000000 0.000000 0.000000
                                        0.000000
                                                     0.00000
                                                                   0.000000
0.000000
             0.000000 0.000000
                                                                                 0.000000
                                                      0.000000
                                        0.000000
                                                                    0.000000
6665 11311
             Dev_Irrigated-C-Low-Confined
                                                                                 0.000000
0.000000
             0.000000
                          0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                             0.000000 0.000000 0.000000
6665 11312
             Dev_Irrigated-C-Low-Unconfined
0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
             0.000000
                           0.000000
                                                      0.000000
                                                                    0.000000
6665 11321
                                       0.000000
                                                                                 0.000000
             Dev_Irrigated-C-Med-Confined
0.000000
             0.000000
                          0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                            0.000000 0.000000
6665 11322
             Dev Irrigated-C-Med-Unconfined
                                                                        0.000000
                                                                    0.000000
0.000000
             0.000000
                          0.000000
                                        0.000000
                                                      0.000000
                                                                                 0.000000
6665 11411
             Dev Irrigated-D-Low-Confined
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
                                                     0.000000
0.000000
             0.000000
                          0.000000
                                        0.000000
                                                                    0.000000
6665 11412
             Dev_Irrigated-D-Low-Unconfined
                                            0.000000 0.000000
                                                                       0.000000
                         0.000000
0.000000
             0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0 000000
6665
     11421
             Dev_Irrigated-D-Med-Confined
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
0.000000
             0.000000 0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
6665 11422
                                              0.000000
             Dev_Irrigated-D-Med-Unconfined
                                                           0.000000
                                                                          0.000000
0.000000
             0.000000
                          0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
6665 12111
             Dev_Pervious-A-Low-Confined
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
0.000000
             0.000000
                          0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                      0.000000
             Dev_Pervious-A-Low-Unconfined 0.000000
                                                                    0.000000
6665 12112
                                                                                 0.000000
                                                      0.000000
0.000000
             0.000000
                          0.000000
                                        0.000000
                                                                    0.000000
6665 12121
             Dev Pervious-A-Med-Confined
                                                                                 0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
0.000000
             0.000000
                           0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
6665 12122
             Dev Pervious-A-Med-Unconfined 0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
0.000000
             0.000000
                          0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
6665 12211
             Dev_Pervious-B-Low-Confined
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
             0.000000
                      0.000000
                                                      0.000000
                                                                    0.000000
0.000000
                                        0.000000
             Dev_Pervious-B-Low-Unconfined 0.000000
6665
     12212
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
0.000000
             0.000000 0.000000
                                                                    0.000000
                                        0.000000
                                                      0.000000
      12221
6665
             Dev_Pervious-B-Med-Confined
                                        0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
0.000000
             0.000000
                       0.000000
                                        0.000000
                                                      0.000000
                                                                    0.000000
6665 12222
             Dev_Pervious-B-Med-Unconfined 0.000000
                                                      0.000000
                                                                    0.000000
                                                                                 0.000000
0.000000
             0.000000
                          0.000000
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             Dev_Pervious-C-Low-Confined
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6665
     12311
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6665 12312
             Dev Pervious-C-Low-Unconfined 0.000000
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6665 12321
             Dev Pervious-C-Med-Confined
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6665 12322
             Dev_Pervious-C-Med-Unconfined 0.000000
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             Dev_Pervious-D-Low-Confined
6665 12411
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6665 12412					
0 000000	Dev_Pervious-D-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6665 12421	Dev_Pervious-D-Med-Confined	0.000000	0.000000	0.000000	0.00000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6665 12422	Dev_Pervious-D-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
					0 000000
6665 13111	Agriculture-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6665 13112	Agriculture-A-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6665 13121	Agriculture-A-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6665 13122	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
					0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6665 13211	Agriculture-B-Low-Confined	0.000000	0.00000	0.00000	0.00000
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					0 000000
6665 13212	Agriculture-B-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6665 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.000000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6665 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6665 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6665 13232	Agriculture-B-High-Unconfined	0 000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6665 13311	Agriculture-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6665 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000		0.000000
	3			0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6665 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000			0.00000
			0.000000	0.000000	
6665 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6665 13331	Agriculture-C-High-Confined	0.000000	0.000000	0.000000	0.00000
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0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6665 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6665 13412	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6665 13421	Agriculture-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
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0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6665 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.00000	0.00000
	0.000000 0.000000	0.000000		0 000000	
0 000000					
0.000000			0.000000	0.000000	
6665 13431	Agriculture-D-High-Confined	0.00000	0.000000	0.000000	0.000000
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6665 13431 0.000000	Agriculture-D-High-Confined 0.000000 0.000000	0.000000 0.000000	0.000000 0.000000	0.000000	
6665 13431 0.000000 6665 13432	Agriculture-D-High-Confined 0.000000 0.000000 Agriculture-D-High-Unconfined	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.00000 0.00000 0.000000	0.000000
6665 13431 0.000000 6665 13432 0.000000	Agriculture-D-High-Confined 0.000000 0.000000 Agriculture-D-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
6665 13431 0.000000 6665 13432	Agriculture-D-High-Confined 0.000000 0.000000 Agriculture-D-High-Unconfined	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
6665 13431 0.000000 6665 13432 0.000000 6665 14121	Agriculture-D-High-Confined 0.000000 0.000000 Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000 0 0.0	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
6665 13431 0.000000 6665 13432 0.000000 6665 14121 0.000000	Agriculture-D-High-Confined 0.000000 0.000000 Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0 0.0	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6665 13431 0.000000 6665 13432 0.000000 6665 14121 0.000000 6665 14122	Agriculture-D-High-Confined 0.000000 0.000000 Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6665 13431 0.000000 6665 13432 0.000000 6665 14121 0.000000	Agriculture-D-High-Confined 0.000000 0.000000 Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0 0.0	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
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6665 13431 0.000000 6665 13432 0.000000 6665 14121 0.000000 6665 14122 0.000000 6665 14131	Agriculture-D-High-Confined 0.000000 0.000000 Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
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6665 13431 0.000000 6665 13432 0.000000 6665 14121 0.000000 6665 14122 0.000000 6665 14131 0.000000 6665 14132	Agriculture-D-High-Confined 0.000000 0.000000 Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
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6665 13431 0.000000 6665 13432 0.000000 6665 14121 0.000000 6665 14122 0.000000 6665 14131 0.000000 6665 14221 0.000000 6665 14221 0.000000 6665 14222	Agriculture-D-High-Confined 0.000000 0.000000 Agriculture-D-High-Unconfined 0.000000 0.000000 Veg_Low-A-Med-Confined 0.00000 Veg_Low-A-Med-Unconfined 0.00000 0.000000 Veg_Low-A-High-Confined 0.00000 0.000000 Veg_Low-A-High-Unconfined 0.00000 0.000000 Veg_Low-B-Med-Confined 0.000000 Veg_Low-B-Med-Confined 0.000000 Veg_Low-B-Med-Confined 0.000000 Veg_Low-B-Med-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
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               Road_Freeway-All-All-All
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              Road_Primary-All-All-All
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              Road_Minor-All-All-All 0.000000
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               Dev_ResHigh-All-All-All
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               Dev ResLow-All-All-All 0.000000
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               Dev_Com-All-All-All 0.000000
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               Dev_Overspray-All-All-All
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6671 11411 0.000000	Dev_Irrigated-D-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 11412	Dev_Irrigated-D-Low-Unconfined				00000
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6671 11421	Dev_Irrigated-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6671 12111	Dev_Pervious-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6671 12112 0.000000	Dev_Pervious-A-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 12121	Dev_Pervious-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6671 12122	Dev_Pervious-A-Med-Unconfined		0.000000	0.000000	0.000000
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6671 12212	Dev_Pervious-B-Low-Unconfined		0.000000	0.000000	0.000000
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6671 12221 0.000000	Dev_Pervious-B-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 12222	Dev Pervious-B-Med-Unconfined		0.000000	0.000000	0.000000
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6671 12311	Dev_Pervious-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6671 12321	Dev_Pervious-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6671 12322	Dev_Pervious-C-Med-Unconfined		0.000000	0.000000	0.000000
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6671 12412	Dev_Pervious-D-Low-Unconfined		0.000000	0.000000	0.000000
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6671 12421 0.000000	Dev_Pervious-D-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 12422	Dev_Pervious-D-Med-Unconfined		0.000000	0.000000	0.000000
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6671 13111	Agriculture-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6671 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6671 13122 0.000000	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
6671 13211	0.000000 0.000000 Agriculture-B-Low-Confined	0.000000	0.000000	0.00000	0.000000
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6671 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6671 13221 0.000000	Agriculture-B-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6671 13222	Agriculture-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6671 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.000000	0.000000
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6671 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6671 13312 0.000000	Agriculture-C-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000 0.000000	0.000000
6671 13321	Agriculture-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6671 13322	Agriculture-C-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6671 13411	Agriculture-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6671 13412 0.000000	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6671
     15331
               Veg_High-C-High-Confined
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6671
     15332
               Veg_High-C-High-Unconfined
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6671
      15421
               Veg_High-D-Med-Confined
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6671
      15422
               Veg_High-D-Med-Unconfined
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6671
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              Veg_High-D-High-Unconfined
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       16000
              Water-All-All-All
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6673
              Road_Freeway-All-All-All
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     2000
              Road_Primary-All-All-All
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6673 3000
              Road_Minor-All-All-All 0.000000
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              Dev_ResHigh-All-All-All
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6673
       5000
              Dev_ResLow-All-All-All 0.000000
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              Dev_Com-All-All-All 0.000000
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              Dev_Ind-All-All 0.000000
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              Dev_Inst-All-All 0.000000
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6673 9000
              Dev_Roof-All-All-All 0.000000 0.000000
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6673 10000
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              Dev_Overspray-All-All-All
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6673 11111
              Dev_Irrigated-A-Low-Confined
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6673 11112
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              Dev_Irrigated-A-Low-Unconfined
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      11121
              Dev_Irrigated-A-Med-Confined
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      11211
              Dev_Irrigated-B-Low-Confined
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6673 11212
              Dev_Irrigated-B-Low-Unconfined
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6673 11221
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              Dev_Irrigated-B-Med-Confined
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6673 11222
              Dev_Irrigated-B-Med-Unconfined
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6673 11311
              Dev Irrigated-C-Low-Confined
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6673 11312
              Dev_Irrigated-C-Low-Unconfined
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6673 11322
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              Dev_Irrigated-D-Low-Confined
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6673 11412
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6673 11421
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6673 11422
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6673 12111
              Dev_Pervious-A-Low-Confined
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6673 12122
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6673 12212
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6673 12221
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6673 12222
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              Dev_Pervious-C-Low-Confined
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6673 12321
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6673 12411
              Dev Pervious-D-Low-Confined
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6673 12412
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6673 12421
              Dev_Pervious-D-Med-Confined
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              Dev_Pervious-D-Med-Unconfined 0.000000
6673 12422
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6673 13111					
	Agriculture-A-Low-Confined	0.000000	0.00000	0.00000	0.00000
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6673 13112	Agriculture-A-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
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6673 13121	Agriculture-A-Med-Confined	0.000000	0.00000	0.00000	0.000000
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6673 13122	Agriculture-A-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6673 13211	Agriculture-B-Low-Confined	0.000000	0.00000	0.000000	0.000000
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6673 13212	Agriculture-B-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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6673 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.00000	0.000000
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6673 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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6673 13231	Agriculture-B-High-Confined	0.000000	0.00000	0.00000	0.000000
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6673 13232	Agriculture-B-High-Unconfined	0.000000	0.00000	0.00000	0.000000
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6673 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.000000	0.00000
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6673 13312	Agriculture-C-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
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6673 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.000000	0.000000
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6673 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6673 13331	Agriculture-C-High-Confined	0.000000	0.000000	0.000000	0.000000
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6673 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.00000	0.000000
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6673 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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6673 13421					0 000000
	Agriculture-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6673 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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6673 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.00000	0.00000
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6673 13432	Agriculture-D-High-Unconfined		0.00000	0.000000	0.000000
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6673 14121	Veg_Low-A-Med-Confined 0.00000	0 0	.000000 0.00	0.000	000
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6673 14122	Veg_Low-A-Med-Unconfined	0.000000	0.00000 0.000000	0.000000	0.000000
6673 14122 0.000000	Veg_Low-A-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	
6673 14122 0.000000 6673 14131	Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
6673 14122 0.000000	Veg_Low-A-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	
6673 14122 0.000000 6673 14131 0.000000	Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000 0.000000	0.000000
6673 14122 0.000000 6673 14131 0.000000 6673 14132	Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	
6673 14122 0.000000 6673 14131 0.000000	Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000 0.000000	0.000000
6673 14122 0.000000 6673 14131 0.000000 6673 14132 0.000000	Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000 0.000000	0.000000
6673 14122 0.000000 6673 14131 0.000000 6673 14132 0.000000 6673 14221	Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6673 14122 0.000000 6673 14131 0.000000 6673 14132 0.000000 6673 14221 0.000000	Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.00000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6673 14122 0.000000 6673 14131 0.000000 6673 14132 0.000000 6673 14221 0.000000 6673 14222	Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6673 14122 0.000000 6673 14131 0.000000 6673 14132 0.000000 6673 14221 0.000000 6673 14222	Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-B-Med-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6673 14122 0.000000 6673 14131 0.000000 6673 14132 0.000000 6673 14221 0.000000 6673 14222 0.000000	Veg_Low-A-Med-Unconfined 0.000000 0.000000 Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-B-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
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6673 15132
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6673 15222
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6673 15232
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6673 15321
             Veg_High-C-Med-Confined
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6673 15322
             Veg_High-C-Med-Unconfined
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6673 15331
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     15332
             Veg_High-C-High-Unconfined
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6673 15421
             Veg_High-D-Med-Confined
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6673 15422
             Veg_High-D-Med-Unconfined
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6673 15431
             Veg_High-D-High-Confined
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6673 15432
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             Veg_High-D-High-Unconfined
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6673 16000
             Water-All-All-All 0.000000
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6674 1000
             Road Freeway-All-All-All
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6674 2000
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             Road_Primary-All-All-All
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6674
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             Road_Minor-All-All-All 0.000000
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6674
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             Dev_ResHigh-All-All-All
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6674 5000
             Dev_ResLow-All-All-All 0.000000
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             Dev_Com-All-All 0.000000 0.000000 0.000000
6674
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             Dev Ind-All-All 0.000000 0.000000 0.000000
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6674 8000
             Dev Inst-All-All 0.000000 0.000000 0.000000
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6674 9000
             Dev_Roof-All-All 0.000000 0.000000 0.000000
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6674 10000
             Dev_Overspray-All-All-All
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6674 11111
             Dev_Irrigated-A-Low-Confined 0.000000
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6674 11112
             Dev_Irrigated-A-Low-Unconfined
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6674 11121
             Dev_Irrigated-A-Med-Confined
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             Dev_Irrigated-A-Med-Unconfined
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6674 11122
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6674 11211
             Dev Irrigated-B-Low-Confined
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6674 11212
             Dev_Irrigated-B-Low-Unconfined
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6674 11221
             Dev_Irrigated-B-Med-Confined
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6674 11222
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             Dev_Irrigated-B-Med-Unconfined
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6674 11311
             Dev_Irrigated-C-Low-Confined
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             Dev_Irrigated-C-Low-Unconfined
6674 11312
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6674 11321
             Dev Irrigated-C-Med-Confined
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6674 11322
             Dev_Irrigated-C-Med-Unconfined
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6674 11411
             Dev_Irrigated-D-Low-Confined
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             Dev_Irrigated-D-Low-Unconfined 0.000000 0.000000 0.000000
6674 11412
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6674 11421	Dev_Irrigated-D-Med-Confined	0.000000	0.000000	0.000000	0.00000
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6674 11422	Dev_Irrigated-D-Med-Unconfined 0.000000 0.000000		0.00000		.000000
0.000000 6674 12111	0.000000 0.000000 Dev_Pervious-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6674 12112	Dev_Pervious-A-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6674 12121 0.000000	Dev_Pervious-A-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6674 12122	Dev Pervious-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6674 12211	Dev_Pervious-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6674 12212 0.000000	Dev_Pervious-B-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6674 12221	Dev_Pervious-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6674 12222	Dev_Pervious-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6674 12311 0.000000	Dev_Pervious-C-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6674 12312	Dev_Pervious-C-Low-Unconfined		0.000000	0.000000	0.000000
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6674 12321	Dev_Pervious-C-Med-Confined	0.000000	0.000000	0.000000	0.00000
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6674 12322 0.000000	Dev_Pervious-C-Med-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6674 12411	Dev Pervious-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6674 12412	Dev_Pervious-D-Low-Unconfined		0.000000	0.000000	0.00000
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6674 12421 0.000000	Dev_Pervious-D-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6674 12422	Dev_Pervious-D-Med-Unconfined		0.000000	0.000000	0.000000
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6674 13111	Agriculture-A-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000 6674 13112	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6674 13112 0.000000	Agriculture-A-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6674 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6674 13122	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000 6674 13211	0.000000 0.000000 Agriculture-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6674 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6674 13221	Agriculture-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6674 13222	0.000000 0.000000 Agriculture-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6674 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.000000	0.000000
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6674 13232	Agriculture-B-High-Unconfined		0.000000	0.000000	0.000000
0.000000 6674 13311	0.000000 0.000000 Agriculture-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6674 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6674 13321 0.000000	Agriculture-C-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6674 13322	Agriculture-C-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6674 13331	Agriculture-C-High-Confined	0.000000	0.000000	0.000000	0.000000
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6674 13411 0.000000	Agriculture-D-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6674 13412	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6674 13421	Agriculture-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6674 13422 0.000000	Agriculture-D-Med-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6674 13431	Agriculture-D-High-Confined	0.000000	0.000000	0.000000	0.000000
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6674 13432	Agriculture-D-High-Unconfined		0.000000	0.000000	0.000000
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      14121 Veg_Low-A-Med-Confined 0.000000
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     14122
             Veg_Low-A-Med-Unconfined
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     14131
             Veg_Low-A-High-Confined
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6674 14132
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             Veg_Low-B-Med-Confined 0.000000
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6674 14221
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6674 14222
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6674 14231
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6674 14232
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6674 14321
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6674 14322
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6674 14331
             Veg_Low-C-High-Confined
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6674 14332
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6674 14421
             Veg_Low-D-Med-Confined 0.000000
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6674 14422
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             Veg_Low-D-Med-Unconfined
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             Veq_Low-D-High-Confined
6674 14431
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6674 14432
             Veg Low-D-High-Unconfined
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             Veg_High-A-Med-Confined
6674 15121
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6674 15122
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6674 15131
             Veg_High-A-High-Confined
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6674 15132
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6674 15221
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             Veg_High-B-Med-Unconfined
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6674 15231
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6674 15232
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6674 15321
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6674 15322
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6674 15331
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6674 15332
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             Veg_High-D-Med-Confined
6674 15421
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6674 15422
             Veg High-D-Med-Unconfined
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6674 15431
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             Veg_High-D-High-Unconfined
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6675 1000
             Road_Freeway-All-All-All
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             Road_Primary-All-All-All
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             Road_Minor-All-All-All 0.000000
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6675 4000
             Dev ResHigh-All-All-All
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             Dev_ResLow-All-All-All0.000000 0.000000 0.000000 0.000000
6675 5000
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             Dev_Com-All-All 0.000000 0.000000 0.000000 0.000000
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              Dev_Ind-All-All-All
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              Dev_Inst-All-All 0.000000
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              Dev_Roof-All-All-All 0.000000
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              Dev_Overspray-All-All-All
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6675 11121
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6675 11422
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6675 12321
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6675 12412
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6675 12422
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6675 13111
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6675 13112
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6675 13121
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6675 13122	Agriculture-A-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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6675 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6675 13212	Agriculture-B-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
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6675 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.000000	0.000000
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6675 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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6675 13231	Agriculture-B-High-Confined	0.000000	0.00000	0.000000	0.000000
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6675 13232	Agriculture-B-High-Unconfined	0.000000	0.00000	0.00000	0.000000
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6675 13311	Agriculture-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
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6675 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6675 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.000000	0.000000
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6675 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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6675 13331	Agriculture-C-High-Confined	0.000000			0.000000
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6675 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.000000	0.000000
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6675 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.000000	0.00000
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6675 13421	Agriculture-D-Med-Confined	0.000000	0.00000	0.000000	0.000000
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6675 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6675 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.00000	0.000000
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6675 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.000000	0.000000
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6675 14121			.000000 0.000		0000
	Veg_Low-A-Med-Confined 0.00000				0000
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6675 14122	Veg_Low-A-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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6675 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.000000	0.000000
6675 14131 0.000000	Veg_Low-A-High-Confined 0.000000 0.000000	0.000000	0.000000 0.000000	0.000000	
6675 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.000000	0.000000
6675 14131 0.000000	Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined	0.000000 0.000000 0.000000	0.00000 0.00000 0.00000	0.00000 0.00000 0.00000	
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6675 14131 0.000000 6675 14132 0.000000 6675 14221	Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
6675 14131 0.000000 6675 14132 0.000000	Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
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6675 14131 0.000000 6675 14132 0.000000 6675 14221 0.000000 6675 14222 0.000000	Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-B-Med-Unconfined 0.000000 0.000000	$ \begin{array}{c} 0.000000 \\ 0.000000 \\ 0.000000 \\ 0.000000 \\ 0 \\ $	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
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6675 14131 0.000000 6675 14132 0.000000 6675 14221 0.000000 6675 14222 0.000000 6675 14231	Veg_Low-A-High-Confined 0.000000 0.000000 Veg_Low-A-High-Unconfined 0.000000 0.000000 Veg_Low-B-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
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15222 Veg_High-B-Med-Unconfined
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6675 15231
           Veg_High-B-High-Confined
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           Veg_High-B-High-Unconfined
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6675 15232
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6675 15321
           Veg_High-C-Med-Confined
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6675 15322
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           Veg_High-C-Med-Unconfined
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6675 15331
           Veg_High-C-High-Confined
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6675 15332
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6675 15421
           Veg_High-D-Med-Confined
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6675 15422
           Veg_High-D-Med-Unconfined
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           Water-All-All 0.000000 0.000000 0.000000 0.000000
6675 16000
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6684 1000
           Road_Freeway-All-All-All
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6684 2000
           Road_Primary-All-All-All
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           Road_Minor-All-All-All0.000000 0.000000 0.000000 0.000000
6684 3000
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6684 4000
           Dev ResHigh-All-All-All
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6684 5000
           Dev_ResLow-All-All-All 0.000000 0.000000 0.000000 0.000000
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6684 6000
           Dev_Com-All-All 0.000000 0.000000 0.000000 0.000000
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6684 7000
           Dev_Ind-Al1-Al1 0.000000 0.000000 0.000000 0.000000
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           Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
6684 8000
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6684 9000
           Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
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6684 10000
           Dev_Overspray-All-All-All
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6684 11112
           Dev_Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
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6684 11121
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           Dev_Irrigated-A-Med-Unconfined 0.000000 0.000000 0.000000
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           Dev_Irrigated-B-Low-Unconfined 0.000000 0.000000 0.000000
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           Dev_Irrigated-D-Low-Confined 0.000000
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           Dev_Irrigated-D-Low-Unconfined 0.000000 0.000000 0.000000
6684 11412
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           0.000000 0.000000 0.000000
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6684 11421
           Dev_Irrigated-D-Med-Confined 0.000000
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                                   egin{array}{ccccc} 0.000000 & 0.000000 & 0.000000 \\ 0.000000 & 0.000000 & 0.000000 \\ \end{array}
0.00000
           0.000000 0.000000
           Dev_Irrigated-D-Med-Unconfined 0.000000 0.000000 0.000000
6684 11422
0.00000
           Dev_Pervious-A-Low-Confined
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6684 12111
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6684 12112	Dev_Pervious-A-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
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6684 12121	Dev_Pervious-A-Med-Confined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 12122	Dev_Pervious-A-Med-Unconfined	0 000000	0.00000	0.000000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 12211	Dev_Pervious-B-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6684 12212	Dev_Pervious-B-Low-Unconfined		0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 12221	Dev_Pervious-B-Med-Confined	0.000000	0.00000	0.000000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 12222	Dev_Pervious-B-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6684 12311	Dev_Pervious-C-Low-Confined	0.000000	0.00000	0.000000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 12312	Dev_Pervious-C-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000				
		0.000000	0.000000	0.00000	
6684 12321	Dev_Pervious-C-Med-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
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6684 12322	Dev_Pervious-C-Med-Unconfined		0.00000	0.00000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 12411	Dev_Pervious-D-Low-Confined	0.000000	0.00000	0.000000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
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6684 12421	Dev_Pervious-D-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 12422	Dev_Pervious-D-Med-Unconfined	0 000000	0.00000	0.00000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 13111	Agriculture-A-Low-Confined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6684 13112	Agriculture-A-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 13121	Agriculture-A-Med-Confined	0.000000	0.00000	0.00000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 13122	Agriculture-A-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
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6684 13211	Agriculture-B-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 13212	Agriculture-B-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 13231	Agriculture-B-High-Confined	0.000000	0.00000	0.00000	0.000000
	2				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 13232	Agriculture-B-High-Unconfined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
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6684 13311	Agriculture-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.00000	0.00000
					0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 13321	Agriculture-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
	Agriculture-C-Med-Unconfined				0 000000
6684 13322	5	0.000000	0.000000	0.000000	0.000000
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6684 13331	Agriculture-C-High-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6684 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 13412	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
	<u> </u>				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 13421	Agriculture-D-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6684 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6684 13431	Agriculture-D-High-Confined	0.000000	0.000000	0.000000	0.00000
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0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.000000	0.000000
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6684 14121	Veg_Low-A-Med-Confined 0.00000		0.000		00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6684 14122	Veg_Low-A-Med-Unconfined	0.000000	0.000000	0.000000	0.00000
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0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6684 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
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6684
       14132
              Veg_Low-A-High-Unconfined
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6684
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      14222
              Veg_Low-B-Med-Unconfined
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6684
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              Veg_Low-B-High-Confined
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              Veg_Low-B-High-Unconfined
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6684
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6684 14321
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6684 14322
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              Veg_Low-C-Med-Unconfined
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              Veg_Low-C-High-Confined
6684 14331
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              Veg_Low-C-High-Unconfined
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6684 14332
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     14421
              Veg_Low-D-Med-Confined 0.000000
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     14422
              Veg_Low-D-Med-Unconfined
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              Veg_Low-D-High-Confined
6684
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6684 14432
              Veg_Low-D-High-Unconfined
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              Veg_High-A-Med-Confined
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6684 15121
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6684 15122
              Veg_High-A-Med-Unconfined
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6684 15131
              Veg_High-A-High-Confined
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6684 15132
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     15221
              Veg_High-B-Med-Confined
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              Veg_High-B-Med-Unconfined
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6684 15231
              Veg_High-B-High-Confined
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              Veg_High-B-High-Unconfined
6684 15232
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6684 15321
              Veg_High-C-Med-Confined
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6684 15322
              Veg High-C-Med-Unconfined
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6684 15331
              Veg_High-C-High-Confined
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6684
      15332
              Veg_High-C-High-Unconfined
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6684
      15421
              Veg_High-D-Med-Confined
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6684 15422
              Veg_High-D-Med-Unconfined
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6684
     15431
              Veg_High-D-High-Confined
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     15432
              Veg_High-D-High-Unconfined
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6684
     16000
              Water-All-All-All 0.000000
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6839
     1000
              Road_Freeway-All-All-All
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      2000
              Road_Primary-All-All-All
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6839
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6839
       3000
              Road_Minor-All-All-All 0.000000
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6839
      4000
              Dev_ResHigh-All-All-All
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              Dev_ResLow-All-All-All 0.000000
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      5000
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6839
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      6000
              Dev_Com-All-All 0.000000 0.000000 0.000000 0.000000
6839
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      7000
              Dev Ind-All-All 0.000000 0.000000 0.000000
6839
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6839
     8000
              Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
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6839 9000
              Dev_Roof-All-All 0.000000 0.000000 0.000000
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6839 10000	Dorr Orrongpwarr All All All	0.000000	0.00000	0.000000	0.00000
0.000000	Dev_Overspray-All-All-All 0.000000 0.000000	0.000000	0.00000	0.000000	0.00000
6839 11111	Dev_Irrigated-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.000000	
6839 11112	Dev_Irrigated-A-Low-Unconfined		.000000 0.0000		00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 11121 0.000000	Dev_Irrigated-A-Med-Confined 0.000000 0.000000	0.000000	0.00000 0.00000	0.000000	0.000000
6839 11122	Dev_Irrigated-A-Med-Unconfined		.000000 0.0000		00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 11211	Dev_Irrigated-B-Low-Confined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6839 11212 0.000000	Dev_Irrigated-B-Low-Unconfined 0.000000 0.000000	0.000000	0.00000	0.000000	0.0000
6839 11221	Dev_Irrigated-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6839 11222	Dev_Irrigated-B-Med-Unconfined	0 E	.000000 0.0000	0.0	00000
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6839 11311	Dev_Irrigated-C-Low-Confined		0.000000	0.000000	0.000000
0.000000 6839 11312	0.000000 0.000000 Dev_Irrigated-C-Low-Unconfined	0.00000.0	0.000000 .000000 0.0000	0.000000	00000
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6839 11321	Dev_Irrigated-C-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 11322	Dev_Irrigated-C-Med-Unconfined		.000000 0.0000		00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 11411 0.000000	Dev_Irrigated-D-Low-Confined 0.000000 0.000000	0.000000	0.00000 0.00000	0.000000	0.000000
6839 11412	Dev_Irrigated-D-Low-Unconfined		.000000 0.0000		00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	0.000000
6839 11421	Dev_Irrigated-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 11422	Dev_Irrigated-D-Med-Unconfined		.000000 0.0000		00000
0.000000 6839 12111	0.000000 0.000000 Dev_Pervious-A-Low-Confined	0.000000	0.00000 0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 12112	Dev_Pervious-A-Low-Unconfined		0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 12121	Dev_Pervious-A-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6839 12122 0.000000	Dev_Pervious-A-Med-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 12211	Dev_Pervious-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 12212	Dev_Pervious-B-Low-Unconfined		0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 12221 0.000000	Dev_Pervious-B-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6839 12222	Dev_Pervious-B-Med-Unconfined		0.00000 0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6839 12311	Dev_Pervious-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 12312	Dev_Pervious-C-Low-Unconfined		0.00000	0.00000	0.00000
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6839 12321 0.000000	Dev_Pervious-C-Med-Confined 0.000000 0.000000	0.000000	0.00000 0.00000	0.000000	0.000000
6839 12322	Dev_Pervious-C-Med-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 12411	Dev_Pervious-D-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 12412 0.000000	Dev_Pervious-D-Low-Unconfined 0.000000 0.000000		0.000000	0.000000	0.000000
6839 12421	0.000000 0.000000 Dev Pervious-D-Med-Confined	0.000000	0.00000 0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6839 12422	Dev_Pervious-D-Med-Unconfined		0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13111	Agriculture-A-Low-Confined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 000000
6839 13112 0.000000	Agriculture-A-Low-Unconfined 0.000000 0.000000	0.000000	0.000000 0.000000	0.000000	0.000000
6839 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6839 13122	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6839 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6839 13212	0.000000 0.000000 Agriculture-B-Low-Unconfined	0.000000	0.00000 0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	0.00000
3.00000	2.300000	3.00000	3.00000	3.30000	

6839 13221					
0000 10221	Agriculture-B-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6839 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
					0 000000
6839 13231	Agriculture-B-High-Confined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13232				0.00000	0.000000
	Agriculture-B-High-Unconfined	0.000000	0.00000	0.00000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
					0 000000
6839 13311	Agriculture-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
					0 000000
6839 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
					0 00000
6839 13321	Agriculture-C-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
					0 00000
6839 13322	Agriculture-C-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13331	Agriculture-C-High-Confined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13411	Agriculture-D-Low-Confined	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13412	Agriculture-D-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13421	Agriculture-D-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13422	Agriculture-D-Med-Unconfined	0.000000	0.000000	0.00000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13431	Agriculture-D-High-Confined	0.000000	0.000000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6839 14121	Veg_Low-A-Med-Confined 0.00000	0 (.000000 0.00	0.00	0000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 14122	Veg_Low-A-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 14132	Veg_Low-A-High-Unconfined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6839 14221	Veg_Low-B-Med-Confined 0.00000	0 (.000000 0.00	0.00	0000
0 000000	0 000000 0 000000	0 000000	0 00000	0 000000	
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
0.000000 6839 14222	0.000000 0.000000 Veg_Low-B-Med-Unconfined	0.000000	0.000000 0.000000	0.000000 0.000000	0.000000
6839 14222	Veg_Low-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
6839 14222 0.000000	Veg_Low-B-Med-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	
6839 14222	Veg_Low-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
6839 14222 0.000000 6839 14231	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	
6839 14222 0.000000 6839 14231 0.000000	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	
6839 14222 0.000000 6839 14231 0.000000 6839 14232	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.00000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 Veg_Low-C-Med-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
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6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000 6839 14332	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
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6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14322 0.000000 6839 14331 0.000000 6839 14332 0.000000 6839 14332	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000
6839 14222 0.000000 6839 14231 0.000000 6839 14232 0.000000 6839 14321 0.000000 6839 14331 0.000000 6839 14331 0.000000 6839 14332 0.000000 6839 14421 0.000000	Veg_Low-B-Med-Unconfined 0.000000 0.000000 Veg_Low-B-High-Confined 0.000000 0.000000 Veg_Low-B-High-Unconfined 0.000000 0.000000 Veg_Low-C-Med-Confined 0.00000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 0.0000000 0.0000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000
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6839
     15321 Veg_High-C-Med-Confined
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           Veg_High-C-Med-Unconfined
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6839 15322
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           Veg_High-C-High-Confined
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6839 15331
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6839 15332
           Veg_High-C-High-Unconfined
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6839 15421
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           Veg_High-D-Med-Confined
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6839 15422
           Veg_High-D-Med-Unconfined
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6839 15431
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6839 15432
           Veg_High-D-High-Unconfined
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6839 16000
           Water-All-All 0.000000 0.000000 0.000000 0.000000
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6844 1000
           Road_Freeway-All-All-All
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0.000000
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6844 2000
           Road_Primary-All-All-All
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           Road_Minor-All-All-All 0.000000 0.000000 0.000000 0.000000
6844 3000
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6844 4000
           Dev_ResHigh-All-All-All
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6844 5000
           Dev_ResLow-All-All-All0.000000 0.000000 0.000000 0.000000
0.000000
           Dev_Com-All-All 0.000000 0.000000 0.000000 0.000000
6844 6000
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6844 7000
           Dev Ind-All-All 0.000000 0.000000 0.000000 0.000000
0.000000
           6844 8000
           Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
0.000000
           Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
6844 9000
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6844 10000
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           Dev_Overspray-All-All-All
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           Dev_Irrigated-A-Low-Confined 0.000000
6844 11111
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6844 11112
           Dev_Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
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6844 11121
           Dev_Irrigated-A-Med-Confined 0.000000
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6844 11122
           Dev Irrigated-A-Med-Unconfined 0.000000 0.000000 0.000000
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6844 11211
           Dev_Irrigated-B-Low-Confined 0.000000
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6844 11212
           Dev_Irrigated-B-Low-Unconfined 0.000000 0.000000 0.000000
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6844 11221
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           Dev_Irrigated-B-Med-Confined 0.000000
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6844 11222
           Dev_Irrigated-B-Med-Unconfined 0.000000 0.000000 0.000000
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6844 11311
           Dev_Irrigated-C-Low-Confined
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6844 11312
           Dev Irrigated-C-Low-Unconfined 0.000000 0.000000 0.000000
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6844 11321
           Dev Irrigated-C-Med-Confined
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           Dev_Irrigated-C-Med-Unconfined 0.000000 0.000000 0.000000
6844 11322
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6844 11411
           Dev_Irrigated-D-Low-Confined
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6844 11412
           Dev_Irrigated-D-Low-Unconfined 0.000000 0.000000 0.000000
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6844 11421
           Dev_Irrigated-D-Med-Confined
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6844 11422
           Dev_Irrigated-D-Med-Unconfined 0.000000 0.000000 0.000000
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6844 12111
           Dev Pervious-A-Low-Confined
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6844 12112
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6844 12121
           Dev_Pervious-A-Med-Confined
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           Dev_Pervious-A-Med-Unconfined 0.000000
6844 12122
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6844 12211	Dev_Pervious-B-Low-Confined	0.000000	0.00000	0.000000	0.00000
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6844 12212	Dev_Pervious-B-Low-Unconfined		0.000000	0.000000	0.00000
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6844 12221	Dev_Pervious-B-Med-Confined	0.000000	0.00000	0.000000	0.000000
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6844 12222	Dev_Pervious-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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6844 12311	Dev_Pervious-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
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6844 12312	Dev_Pervious-C-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
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6844 12321	Dev_Pervious-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6844 12322	Dev_Pervious-C-Med-Unconfined	0 000000	0.00000	0.00000	0.000000
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6844 12411	Dev_Pervious-D-Low-Confined	0.000000	0.00000	0.00000	0.00000
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6844 12412	Dev_Pervious-D-Low-Unconfined		0.00000	0.000000	0.000000
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6844 12421	Dev_Pervious-D-Med-Confined	0.000000	0.00000	0.00000	0.000000
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6844 12422	Dev_Pervious-D-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6844 13111	Agriculture-A-Low-Confined		0.000000	0.000000	0.000000
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6844 13112	Agriculture-A-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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6844 13121	Agriculture-A-Med-Confined	0.000000	0.00000	0.00000	0.000000
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6844 13122	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6844 13211	Agriculture-B-Low-Confined	0.000000	0.00000	0.00000	0.000000
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6844 13212	Agriculture-B-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
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6844 13221	Agriculture-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6844 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6844 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.00000	0.000000
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6844 13232	Agriculture-B-High-Unconfined		0.000000	0.000000	0.000000
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6844 13311	Agriculture-C-Low-Confined	0.000000	0.00000	0.00000	0.000000
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6844 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
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6844 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.000000	0.000000
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6844 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6844 13331	Agriculture-C-High-Confined	0.000000	0.00000	0.00000	0.000000
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6844 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.000000	0.000000
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6844 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
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6844 13421	Agriculture-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6844 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6844 13431	Agriculture-D-High-Confined		0.000000		0.000000
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6844 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.00000	0.000000
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6844 14121	Veg_Low-A-Med-Confined 0.00000		.000000 0.00	0.000	0000
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	Veg_Low-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6844 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.000000	0.000000
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6844 14132	Veg_Low-A-High-Unconfined	0.000000	0.00000	0.00000	0.000000
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6844 14221	Veg_Low-B-Med-Confined 0.00000			0000 0.000	1000
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6844 14222	Veg_Low-B-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6844
             Veg_Low-B-High-Confined
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      14232
              Veg_Low-B-High-Unconfined
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              Veg_Low-C-Med-Confined 0.000000
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              Veg_Low-C-Med-Unconfined
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              Veg_Low-C-High-Confined
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6844 14332
              Veg_Low-C-High-Unconfined
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6844 14421
             Veg_Low-D-Med-Confined 0.000000
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6844 14422
             Veg_Low-D-Med-Unconfined
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              Veg_Low-D-High-Confined
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6844 14431
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              Veg_Low-D-High-Unconfined
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6844 15121
             Veg_High-A-Med-Confined
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     15122
             Veg_High-A-Med-Unconfined
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6844 15131
             Veg_High-A-High-Confined
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6844 15132
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6844 15221
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6844 15222
              Veg High-B-Med-Unconfined
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     15232
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6844 15322
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             Veg_High-C-Med-Unconfined
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6844 15331
             Veg_High-C-High-Confined
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6844 15332
              Veg_High-C-High-Unconfined
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6844 15421
              Veg High-D-Med-Confined
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6844 15422
              Veg_High-D-Med-Unconfined
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      15431
              Veg_High-D-High-Confined
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      15432
              Veg_High-D-High-Unconfined
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6844 16000
             Water-All-All-All 0.000000
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6850
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              Road_Freeway-All-All-All
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             Road_Primary-All-All-All
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              Road Minor-All-All-All 0.000000
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6850
     4000
              Dev_ResHigh-All-All-All
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6850
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              Dev_ResLow-All-All-All 0.000000
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      6000
              Dev_Com-All-All 0.000000 0.000000 0.000000
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6850
      7000
             Dev_Ind-All-All 0.000000
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              Dev_Inst-All-All 0.000000 0.000000 0.000000
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             Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
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             Dev_Overspray-All-All-All
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6850 11111
             Dev_Irrigated-A-Low-Confined 0.000000
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             Dev_Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
6850 11112
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6850 11121 0.000000	Dev_Irrigated-A-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 11122	Dev_Irrigated-A-Med-Unconfined				000000
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6850 11211	Dev_Irrigated-B-Low-Confined		0.000000	0.000000	0.000000
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6850 11212	Dev_Irrigated-B-Low-Unconfined	d 0	.000000 0	.000000 0.0	00000
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6850 11221	Dev_Irrigated-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6850 11222	Dev_Irrigated-B-Med-Unconfined	d 0	.000000	.000000 0.0	00000
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6850 11311	Dev_Irrigated-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
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6850 11312	Dev_Irrigated-C-Low-Unconfined				00000
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6850 11321	Dev_Irrigated-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6850 11322	Dev_Irrigated-C-Med-Unconfined				000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 11411 0.000000	Dev_Irrigated-D-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 11412	Dev Irrigated-D-Low-Unconfined				000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	0.00000
6850 11421	Dev_Irrigated-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6850 11422	Dev Irrigated-D-Med-Unconfined				00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 12111	Dev_Pervious-A-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 12112	Dev_Pervious-A-Low-Unconfined	0.000000	0.00000	0.000000	0.00000
0.00000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 12121	Dev_Pervious-A-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 12122	Dev_Pervious-A-Med-Unconfined		0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 12211	Dev_Pervious-B-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 12212	Dev_Pervious-B-Low-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0 00000
6850 12221	Dev_Pervious-B-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.000000 6850 12222	0.000000 0.000000 Dev_Pervious-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0.00000
6850 12311	Dev_Pervious-C-Low-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6850 12312	Dev_Pervious-C-Low-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 12321	Dev_Pervious-C-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 12322	Dev_Pervious-C-Med-Unconfined	0.000000	0.00000	0.000000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 12411	Dev_Pervious-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 12421	Dev_Pervious-D-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 12422	Dev_Pervious-D-Med-Unconfined		0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0 00000
6850 13111	Agriculture-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6850 13112	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 13112 0.000000	Agriculture-A-Low-Unconfined 0.000000 0.000000	0.000000	0.000000	0.00000	0.00000
6850 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6850 13122	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6850 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 13221	Agriculture-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 13222	Agriculture-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6850 13231	Agriculture-B-High-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	

6850 13232	Agriculture-B-High-Unconfined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
					0 000000
6850 13311	Agriculture-C-Low-Confined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13312	Agriculture-C-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
					0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.00000	0.000000
	-				0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000			
			0.00000	0.000000	
6850 13331	Agriculture-C-High-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
					0 00000
6850 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13421					0.000000
	Agriculture-D-Med-Confined	0.000000	0.00000	0.000000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
					0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.00000	0.000000
	-				
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 14121	Veg_Low-A-Med-Confined 0.00000	0.	.000000 0.000	0.00	0000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 14122	Veg_Low-A-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
					0 000000
6850 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 14132	Veg_Low-A-High-Unconfined	0.000000	0.00000	0.000000	0.000000
	-				0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6850 14221	Veg_Low-B-Med-Confined 0.00000	0	.000000 0.000	0.00	0000
	-				0000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 14222	Veg_Low-B-Med-Unconfined	0.000000	0.00000	0.00000	0.00000
	-				
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 14231	Veg_Low-B-High-Confined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6850 14232	Veg_Low-B-High-Unconfined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
					0000
6850 14321	Veg_Low-C-Med-Confined 0.00000	0 0	0.000	0.00	0000
					0000
6850 14321 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000	0.000000	0.00000	0.000000	
6850 14321 0.000000 6850 14322	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined	0.000000	0.00000 0.000000 0.000000	0.00 0.000000 0.000000	0.00000
6850 14321 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000	0.000000	0.00000	0.000000	
6850 14321 0.000000 6850 14322 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000	0.00 0.000000 0.000000 0.000000	0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined	0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000 0.000000	0.00 0.000000 0.000000 0.000000 0.000000	
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined	0.000000 0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000	0 0.00000 0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined	0 0.00000 0.000000 0.000000 0.000000 0.000000	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 0.0000000 0.0000000 0.0000000 0.000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Unconfined	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 0.000000 0.0000000 0.000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Confined	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 0.000000 0.0000000 0.000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000 Veg_Low-D-High-Confined 0.0000000 0.0000000 0.0000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431 0.000000 6850 14431	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Confined 0.000000 0.0000000 Veg_Low-D-High-Unconfined	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431 0.000000 6850 14432 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000 Veg_Low-D-High-Unconfined 0.000000 0.0000000 Veg_Low-D-High-Unconfined 0.000000 0.0000000 0.0000000 Veg_Low-D-High-Unconfined 0.000000 0.0000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000
6850 14321 0.000000 6850 14322 0.000000 6850 14331 0.000000 6850 14332 0.000000 6850 14421 0.000000 6850 14422 0.000000 6850 14431 0.000000 6850 14432 0.000000	Veg_Low-C-Med-Confined 0.00000 0.000000 0.000000 0.000000 Veg_Low-C-Med-Unconfined 0.000000 Veg_Low-C-High-Confined 0.000000 0.000000 Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Confined 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000 Veg_Low-D-High-Unconfined 0.000000 0.0000000 Veg_Low-D-High-Unconfined 0.000000 0.0000000 0.0000000 Veg_Low-D-High-Unconfined 0.000000 0.0000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.00000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000
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Veg_High-C-High-Unconfined
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6850 15421
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6850 15431
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6850
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6856 1000
             Road_Freeway-All-All-All
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6856 2000
             Road_Primary-All-All-All
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6856 3000
             Road_Minor-All-All-All 0.000000
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             Dev_ResHigh-All-All-All
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             Dev_ResLow-All-All-All 0.000000
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             Dev_Com-All-All 0.000000 0.000000 0.000000
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             Dev_Ind-All-All 0.000000 0.000000 0.000000 0.000000
6856 7000
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6856 8000
             Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
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             Dev_Roof-All-All 0.000000 0.000000 0.000000 0.000000
6856 9000
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6856 10000
             Dev_Overspray-All-All-All
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6856 11111
             Dev_Irrigated-A-Low-Confined 0.000000
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6856 11112
             Dev_Irrigated-A-Low-Unconfined 0.000000 0.000000 0.000000
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6856 11121
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             Dev_Irrigated-A-Med-Confined
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6856 11122
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6856 11211
             Dev_Irrigated-B-Low-Confined 0.000000
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6856 11212
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6856 11221
             Dev Irrigated-B-Med-Confined
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6856 11222
             Dev_Irrigated-B-Med-Unconfined 0.000000 0.000000 0.000000
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6856 11311
             Dev_Irrigated-C-Low-Confined
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6856 11312
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6856 11321
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6856 11322
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6856 11411
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6856 11412
             Dev Irrigated-D-Low-Unconfined
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6856 11421
             Dev_Irrigated-D-Med-Confined
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6856 11422
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6856 12111
             Dev_Pervious-A-Low-Confined
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6856 12112
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6856 12121
             Dev Pervious-A-Med-Confined
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6856 12122
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6856 12211
             Dev Pervious-B-Low-Confined
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6856 12212
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             Dev_Pervious-B-Med-Confined
6856 12221
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6856 12222					
0000 1000	Dev_Pervious-B-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
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6856 12311	Dev Pervious-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6856 12312	Dev_Pervious-C-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
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			0.00000	0.000000	
6856 12321	Dev_Pervious-C-Med-Confined	0.000000	0.000000	0.00000	0.000000
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6856 12322					0.000000
	Dev_Pervious-C-Med-Unconfined		0.00000	0.000000	0.00000
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6856 12411	Dev_Pervious-D-Low-Confined	0.000000	0.000000	0.00000	0.000000
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		0.000000	0.000000	0.000000	
6856 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
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6856 12421	Dev Pervious-D-Med-Confined				0.000000
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6856 12422	Dev_Pervious-D-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
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6856 13111	Agriculture-A-Low-Confined	0.000000	0.00000	0.00000	0.00000
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6856 13112	Agriculture-A-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
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6856 13121	Agriculture-A-Med-Confined	0.000000	0.000000	0.00000	0.000000
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6856 13122	Agriculture-A-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6856 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.00000	0.000000
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6856 13212	Agriculture-B-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
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6856 13221	Agriculture-B-Med-Confined	0.000000	0.000000	0.00000	0.000000
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6856 13222	Agriculture-B-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
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6856 13231	Agriculture-B-High-Confined				0.000000
	_	0.000000	0.000000	0.000000	0.00000
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6856 13232	Agriculture-B-High-Unconfined	0.000000	0.000000	0.00000	0.000000
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6856 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.00000	0.000000
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	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.00000	0.00000
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6856 13321	Agriculture-C-Med-Confined	0.000000	0.000000	0.00000	0.000000
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6856 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6856 13331	Agriculture-C-High-Confined	0.000000	0.000000	0.00000	0.000000
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6856 13411	Agriculture-D-Low-Confined	0.000000	0.000000	0.00000	0.000000
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6856 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0 00000	
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6856 13421	Agriculture-D-Med-Confined	0.000000	0.000000		0.000000
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      14422
              Veg_Low-D-Med-Unconfined
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6856 14431
              Veg_Low-D-High-Confined
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6856 14432
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              Veg_Low-D-High-Unconfined
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      15131
              Veg_High-A-High-Confined
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              Veg_High-B-Med-Confined
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6856 15222
              Veg_High-B-Med-Unconfined
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6856 15231
              Veg_High-B-High-Confined
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6856 15232
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              Veg_High-B-High-Unconfined
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6856 15321
              Veg High-C-Med-Confined
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6856 15322
              Veg_High-C-Med-Unconfined
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      15331
              Veg_High-C-High-Confined
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      15332
              Veg_High-C-High-Unconfined
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6856 15421
              Veg_High-D-Med-Confined
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              Veg_High-D-High-Unconfined
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              Water-All-All-All 0.000000
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6859
      1000
              Road_Freeway-All-All-All
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6859
       2000
              Road_Primary-All-All-All
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6859
      3000
              Road_Minor-All-All-All 0.000000
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6859
              Dev_ResHigh-All-All-All
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              Dev ResLow-All-All-All 0.000000
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              Dev Com-All-All-All 0.000000
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6859
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              Dev_Ind-All-All 0.000000 0.000000 0.000000 0.000000
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      8000
              Dev_Inst-All-All 0.000000 0.000000 0.000000
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6859
      9000
              Dev_Roof-All-All 0.000000 0.000000 0.000000
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6859
     10000
              Dev_Overspray-All-All-All
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6859
      11111
              Dev_Irrigated-A-Low-Confined
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6859
              Dev_Irrigated-A-Low-Unconfined
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              Dev_Irrigated-A-Med-Confined
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     11121
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6859 11122
              Dev_Irrigated-A-Med-Unconfined
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              Dev_Irrigated-B-Low-Confined 0.000000
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6859 11211
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6859 11212	Dev_Irrigated-B-Low-Unconfined	d 0	.000000 0	.000000 0.	000000
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6859 11221 0.000000	Dev_Irrigated-B-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6859 11222	Dev_Irrigated-B-Med-Unconfined				000000
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6859 11311	Dev_Irrigated-C-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6859 11312	Dev_Irrigated-C-Low-Unconfined				000000
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6859 11322	Dev_Irrigated-C-Med-Unconfined				000000
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6859 11411	Dev_Irrigated-D-Low-Confined	0.000000	0.000000	0.00000	0.000000
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6859 11412 0.000000	Dev_Irrigated-D-Low-Unconfined 0.000000 0.000000	0.000000	0.00000	0.00000	0.00000
6859 11421	Dev_Irrigated-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6859 11422	Dev_Irrigated-D-Med-Unconfined	0 E		.000000 0.	000000
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6859 12111	Dev_Pervious-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6859 12121	Dev_Pervious-A-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6859 12122	Dev_Pervious-A-Med-Unconfined		0.000000	0.000000	0.000000
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6859 12211 0.000000	Dev_Pervious-B-Low-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
6859 12212	Dev_Pervious-B-Low-Unconfined		0.000000	0.000000	0.000000
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6859 12221	Dev_Pervious-B-Med-Confined	0.000000	0.000000	0.000000	0.000000
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6859 12222	Dev_Pervious-B-Med-Unconfined		0.000000	0.000000	0.000000
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6859 12312	Dev_Pervious-C-Low-Unconfined		0.000000	0.000000	0.000000
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6859 12321	Dev_Pervious-C-Med-Confined	0.000000	0.00000	0.00000	0.000000
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6859 12322 0.000000	Dev_Pervious-C-Med-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 12411	Dev_Pervious-D-Low-Confined	0.000000	0.000000	0.000000	0.000000
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6859 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
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6859 12421	Dev_Pervious-D-Med-Confined	0.000000	0.000000	0.000000	0.000000
0.000000 6859 12422	0.000000 0.000000 Dev_Pervious-D-Med-Unconfined	0.000000	0.000000	0.000000	0.00000
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6859 13111	Agriculture-A-Low-Confined	0.000000	0.000000	0.000000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6859 13112	Agriculture-A-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6859 13121 0.000000	Agriculture-A-Med-Confined 0.000000 0.000000	0.000000	0.000000	0.000000	0.00000
6859 13122	Agriculture-A-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6859 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.00000	0.000000
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6859 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	0.00000
6859 13222	Agriculture-B-Med-Unconfined	0.000000	0.000000	0.000000	0.000000
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6859 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.000000	0.000000
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6859 13232 0.000000	Agriculture-B-High-Unconfined 0.000000 0.000000	0.000000	0.000000	0.000000	0.000000
0.000000 6859 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.000000	0.00000
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6859 13312	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.000000	0.000000
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6859 13321					
0009 13321	Agriculture-C-Med-Confined	0.000000	0.00000	0.00000	0.000000
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6859 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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6859 13331	Agriculture-C-High-Confined	0.000000	0.00000	0.000000	0.000000
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6859 13411	Agriculture-D-Low-Confined	0.000000	0.00000	0.000000	0.000000
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0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
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6859 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.000000	0.000000
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6859 13421	Agriculture-D-Med-Confined	0.000000	0.00000	0.000000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 13422	Agriculture-D-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
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6859 13431	Agriculture-D-High-Confined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.00000	0.00000
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6859 14121	Veg_Low-A-Med-Confined 0.0000	0.0	.000000 0.00	0.00	0000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 14122	Veg_Low-A-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 14131	Veg_Low-A-High-Confined	0.000000	0.00000	0.00000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6859 14132	Veg_Low-A-High-Unconfined	0.000000	0.00000	0.00000	0.00000
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6859 14221	Veg_Low-B-Med-Confined 0.00000	n n	.000000 0.00	0.00	1000
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0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6859 14222	Veg_Low-B-Med-Unconfined	0.000000	0.00000	0.000000	0.000000
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0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6859 14231		0.000000		0.000000	0 00000
	Veg_Low-B-High-Confined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
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6859 14232	Veg_Low-B-High-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6859 14321	Veg_Low-C-Med-Confined 0.0000	0 0	.000000 0.00	0.00	3000
0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 14322	Veg_Low-C-Med-Unconfined	0.000000	0.00000	0.00000	0.00000
0.00000	0.000000 0.000000	0.000000	0.00000	0.000000	
6859 14331	Veg_Low-C-High-Confined	0.000000	0.00000	0.00000	0.00000
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0.000000	0.000000 0.000000	0.000000	0.00000	0.000000	
0.000000 6859 14332					0.00000
6859 14332	Veg_Low-C-High-Unconfined	0.000000	0.000000	0.000000	0.000000
6859 14332 0.000000	Veg_Low-C-High-Unconfined 0.000000 0.000000	0.000000	0.00000 0.00000	0.000000	0.000000
6859 14332 0.000000	Veg_Low-C-High-Unconfined 0.000000 0.000000	0.000000	0.00000 0.00000	0.000000	
6859 14332 0.000000 6859 14421	Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000	0.000000 0.000000 00	0.000000 0.000000 .000000 0.00	0.000000 0.000000 0000 0.000	
6859 14332 0.000000	Veg_Low-C-High-Unconfined 0.000000 0.000000	0.000000	0.00000 0.00000	0.000000	
6859 14332 0.000000 6859 14421 0.000000	Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000	0.000000 0.000000 00 0	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0000
6859 14332 0.000000 6859 14421 0.000000 6859 14422	Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined	0.000000 0.000000 00 0 0.000000 0.000000	0.000000 0.000000 .000000 0.000000 0.000000	0.000000 0.000000 0000 0.000 0.000000 0.000000	
6859 14332 0.000000 6859 14421 0.000000	Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000	0.000000 0.000000 00 0	0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000	0000
6859 14332 0.000000 6859 14421 0.000000 6859 14422 0.000000	Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 .000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.00000
6859 14332 0.000000 6859 14421 0.000000 6859 14422 0.000000 6859 14431	Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 Veg_Low-D-High-Confined	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 .000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0000
6859 14332 0.000000 6859 14421 0.000000 6859 14422 0.000000	Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 .000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.00000
6859 14332 0.000000 6859 14421 0.000000 6859 14422 0.000000 6859 14431 0.000000	Veg_Low-C-High-Unconfined 0.000000 0.000000 Veg_Low-D-Med-Confined 0.00000 0.000000 0.000000 Veg_Low-D-Med-Unconfined 0.000000 0.000000 Veg_Low-D-High-Confined 0.000000 0.000000	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.000000 0.000000	0.000000
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Veg_High-D-High-Confined
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             Veg_High-D-High-Unconfined
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             Water-All-All-All 0.000000
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6861
      1000
             Road_Freeway-All-All-All
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             Road_Primary-All-All-All
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6861 3000
             Road_Minor-All-All-All 0.000000
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6861
      4000
             Dev_ResHigh-All-All-All
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6861 5000
             Dev_ResLow-All-All-All 0.000000
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      6000
             Dev_Com-All-All-All 0.000000
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6861
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      7000
             Dev_Ind-All-All-All 0.000000
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6861
      8000
             Dev_Inst-All-All 0.000000 0.000000 0.000000 0.000000
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             Dev_Roof-All-All-All 0.000000 0.000000
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6861 10000
             Dev_Overspray-All-All-All
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6861 11111
             Dev_Irrigated-A-Low-Confined 0.000000
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6861 11112
             Dev_Irrigated-A-Low-Unconfined
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6861 11121
             Dev Irrigated-A-Med-Confined
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             Dev_Irrigated-A-Med-Unconfined 0.000000 0.000000
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6861 11122
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6861 11211
             Dev_Irrigated-B-Low-Confined
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6861 11212
             Dev_Irrigated-B-Low-Unconfined
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6861 11221
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             Dev_Irrigated-B-Med-Confined
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6861 11222
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             Dev_Irrigated-B-Med-Unconfined
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6861 11311
             Dev_Irrigated-C-Low-Confined
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6861 11312
             Dev Irrigated-C-Low-Unconfined
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6861 11321
             Dev_Irrigated-C-Med-Confined
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6861 11322
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6861 11411
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             Dev_Irrigated-D-Low-Confined
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6861 11412
             Dev_Irrigated-D-Low-Unconfined
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6861 11421
             Dev_Irrigated-D-Med-Confined
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6861 11422
             Dev Irrigated-D-Med-Unconfined
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6861 12111
             Dev Pervious-A-Low-Confined
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6861 12112
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             Dev_Pervious-A-Med-Confined
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6861 12121
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6861 12122
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6861 12211
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6861 12221
             Dev Pervious-B-Med-Confined
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6861 12222
             Dev Pervious-B-Med-Unconfined 0.000000
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6861 12311
             Dev_Pervious-C-Low-Confined
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             Dev_Pervious-C-Low-Unconfined 0.000000
6861 12312
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6861 12321	Dev_Pervious-C-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 12322	Dev_Pervious-C-Med-Unconfined		0.000000	0.00000	0.000000
					0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6861 12411	Dev_Pervious-D-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 12412	Dev_Pervious-D-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 12421	Dev_Pervious-D-Med-Confined	0.000000	0.00000	0.00000	0.000000
	_				0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 12422	Dev Pervious-D-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13111	Agriculture-A-Low-Confined	0.000000	0.00000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13112	Agriculture-A-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
					0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13121	Agriculture-A-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13122	Agriculture-A-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
					0 000000
6861 13211	Agriculture-B-Low-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13212	Agriculture-B-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
					0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13221	Agriculture-B-Med-Confined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13222	Agriculture-B-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13231	Agriculture-B-High-Confined	0.000000	0.000000	0.00000	0.000000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13232	Agriculture-B-High-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13311	Agriculture-C-Low-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13312					0 000000
	Agriculture-C-Low-Unconfined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13321	Agriculture-C-Med-Confined	0.000000	0.000000	0.00000	0.000000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13322	Agriculture-C-Med-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
					0 000000
6861 13331	Agriculture-C-High-Confined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13411	Agriculture-D-Low-Confined	0.000000	0.000000	0.00000	0.000000
	_				0.00000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13412	Agriculture-D-Low-Unconfined	0.000000	0.00000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13421	Agriculture-D-Med-Confined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13422	Agriculture-D-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 13431	Agriculture-D-High-Confined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 13432	Agriculture-D-High-Unconfined	0.000000	0.00000	0.00000	0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
	Veg_Low-A-Med-Confined 0.00000				000
6861 14121	-				000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 14122	Veg_Low-A-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
					0 000000
6861 14131	Veg_Low-A-High-Confined	0.000000	0.000000	0.00000	0.000000
0.00000	0.000000 0.000000	0.000000	0.00000	0.00000	
6861 14132	Veg Low-A-High-Unconfined	0.000000	0.000000	0.00000	0.000000
	3_ 3				0.00000
0.00000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 14221	Veg Low-B-Med-Confined 0.00000	0 0	.000000	.000000 0.000	000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 14222	Veg_Low-B-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 14231	Veg_Low-B-High-Confined	0.000000	0.000000	0.00000	0.000000
	-				0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 14232	Veg_Low-B-High-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.000000	
6861 14321	Veg_Low-C-Med-Confined 0.00000	0	.000000 0	.000000 0.000	000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
					0 000000
6861 14322	Veg_Low-C-Med-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 14331	Veg_Low-C-High-Confined	0.000000	0.000000	0.00000	0.000000
					0.00000
0.000000	0.000000 0.000000	0.000000	0.000000	0.00000	
6861 14332	Veg_Low-C-High-Unconfined	0.000000	0.000000	0.00000	0.000000
0.000000	0.000000 0.000000	0.000000	0.00000	0.00000	
0.00000	0.00000	3.300000	0.00000	3.00000	

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6861 14431 Veg_Low-D-High-Confined 0.000000

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              6861 14422 Veg_Low-D-Med-Unconfined
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6861 14432 Veg_Low-D-High-Unconfined 0.000000

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6861 15121 Veg_High-A-Med-Confined 0.000000

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              6861 15221 Veg_High-B-Med-Confined
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        6861
        15222
        Veg_High-B-Med-Unconfined
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        15231
        Veg_High-B-High-Confined
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        15232
        Veg_High-B-High-Unconfined
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        Veg_High-C-Med-Confined
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        6861
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        Veg_High-C-Med-Unconfined
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      6861
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      Veg_High-C-High-Confined
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        6861
        15331
        Veg_High-C-High-Confined
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              6861 16000 Water-All-All 0.000000 0.000000 0.000000 0.000000
              0.000000 0.000000 0.000000 0.000000 0.000000
C-----
c680 TMDL reach control (used if ncrch > 0 on card 600)
C
       rchid controlled reach id outlet controlled reach outlet id
C
C
       switch_mon monthly switch to control conc limit or reduction of pollutant from the corresponding reach
(0-off, 1-on)
C
c rchid outlet switch_1 switch_2.....switch_12
C-----
                                                                                                       -----
c685 TMDL reach control (used if ncrch > 0 on card 600)
C
                             controlled reach id
     rchid
C
         outlet
C
                                 controlled reach outlet id
         limit-flow flow limit from the corresponding reach (cfs)
С
       limit_pol
                                concentration limit of pollutant from the corresponding reach (mg/l or ug/l or #/100ml)
C
     rchid outlet limit_flow limit_qual1...limit_qual2...limit_qualn
C-----
c690 TMDL reach control (used if ncrch > 0 on card 600)
C
                                 controlled reach id
C
        rchid
    outlet controlled reach outlet id
С
       reduction
                             reduction of pollutant from the corresponding reach (fraction)
C
                                  reduction in outflow will also reduce the pollutant mass from the outflow and
                                  any defined reduction to pollutant will be the additional
C
\texttt{c} \quad \texttt{rchid} \quad \texttt{outlet} \quad \texttt{reduction\_flow}... \texttt{reduction\_qual1}... \texttt{reduction\_qual2}... \texttt{reduction\_qualn}
```

14421 Veg_Low-D-Med-Confined 0.000000 0.000000 0.000000

0.000000

SUSTAIN Model Input

C------

```
c SUSTAIN: System for Urban Stormwater Treatment and Analysis INtegration
c Version 2.1 - Jan 2020
c Created through code updates by:
c Paradigm Environmental, Inc.
c San Diego, California, USA
c www.paradigmh2o.com
c Based upon SUSTAIN version 1.2 (Apr 2014), originally developed by:
c United States Environmental Protection Agency
c Office of Research & Development
c with support by Tetra Tech, Inc.
\verb|c|| \texttt{https://www.epa.gov/water-research/system-urban-stormwater-treatment-and-analysis-integration-sustain|} \\
c NOTE: The line starting with the letter c and followed by space or - is a comment line.
               There must be no comment line in between the data lines
C
               The input text field must be a continuous string without any space in between the characters
C-----
c700 Model Controls
c LINE1 = Land simulation control (0-external),
                  Land output directory path (containing unit-area land output timeseries)
C
С
                  Note: external land timeseries data must be in this order;
                              flow (in./timestep),
C
C
                              groundwater recharge (in./timestep),
                              pollutant 1 (lb/acre/timestep),
C
                              pollutant2, ...
C
c LINE2 = Start date of simulation (Year Month Day)
c LINE3 = End date of simulation (Year Month Day)
c LINE4 = Land Timeseries timestep (Minute),
                   BMP simulation timestep (Minute),
C
                   CRRAT = The ratio of max velocity to mean velocity under typical flow conditions (value of 1.0 or
C
greater),
                  Model output control (0-same timestep as land time series; 1-hourly),
C
                  Model output directory path
c LINE5 = PET Flag (0-constant monthly PET, 1-PET from the timeseries (in/timestep as land time series),
                  PET time series file path (required if PET flag is 1)
c LINE6 = Monthly PET rate (in/day) if PET flag is 0 OR
                 Monthly PET coefficient (multiplier to PET value) if PET flag is 1
C
             C:\SUSTAIN_X64\LA0583005\Timeseries\85P
0
2010
2010
                            6
             1
60
              5
                            1.5
                                      1
                                                        C:\SUSTAIN_X64\LA0583005\Output\85P
0.0632 \quad 0.0798 \quad 0.1174 \quad 0.1507 \quad 0.1626 \quad 0.1787 \quad 0.1897 \quad 0.1855 \quad 0.1547 \quad 0.1047 \quad 0.0715 \quad 0.0531 \quad 0.0897 \quad 0.0917 \quad 0
c705 Pollutant Definition
C
c POLLUT_ID = Unique pollutant identifier (Sequence number same as in land output time series)
c POLLUT_NAME = Unique pollutant name
c MULTIPLIER = Multiplying factor used to convert the pollutant load to lbs (external control)
c SED_FLAG = The sediment flag (0-not sediment,1-sand,2-silt,3-clay,4-total sediment)
                             if = 4 SEDIMENT will be splitted into sand, silt, and clay based on the fractions defined in card
710.
c SED OUAL
                       = The sediment-associated pollutant flag (0-no, 1-yes)
                             if = 1 then SEDIMENT is required in the pollutant list
c SAND_QFRAC = The sediment-associated qual-fraction on sand (0-1), only required if SED_QUAL = 1
c SILT_QFRAC = The sediment-associated qual-fraction on silt (0-1), only required if SED_QUAL = 1
c CLAY_QFRAC = The sediment-associated qual-fraction on clay (0-1), only required if SED_QUAL = 1
С
c POLLUT_ID
                            POLLUT_NAME
                                                        MULTIPLIER
                                                                                    SED_FLAG
                                                                                                                  SED OUAL
                                                                                                                                              SAND OFRAC
              CLAY_QFRAC
1
              TSS
                            2240
                                          0
                                                         0
                                                                       0
                                                                                     0
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2
              TN
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                          1
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3
             TP
                                        0
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                                                                     0
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4
              TCD
                                           0
                                                         0
                                                                       0
                                                                                     0
                                                                                                    0
                            1
5
              TCU
                            1
                                          0
                                                         0
                                                                       0
                                                                                      0
                                                                                                    0
6
              TPB
                                          0
                                                                       0
              TZN
                            1
                                         Ω
                                                         Ω
                                                                      Ω
                                                                                    Ω
                                                                                                    Ω
c710 LAND USE DEFINITION (required if land simulation control is external)
C
c LANDTYPE
                                = Unique land use definition identifier
```

c LANDNAME

= land use name

```
c IMPERVIOUS
               = Distinguishes pervious/impervious land unit (0-pervious; 1-impervious)
c TIMESERIESFILE = File name containing input timeseries
c SAND_FRAC = The fraction of total sediment from the land which is sand (0-1) c SILT_FRAC = The fraction of total sediment from the land which is silt (0-1)
c CLAY_FRAC
              = The fraction of total sediment from the land which is clay (0-1)
C
                                        TIMESERIESFILE SAND_FRAC
c LANDTYPE
             LANDNAME
                           IMPERVIOUS
                                                                   SILT_FRAC
                                                                                 CLAY FRAC
                                                                               0.55 0.4
                                       1000_Road_Freeway-All-All-All.txt 0
   Road Freeway-All-All-All 1
1
C-----
c712 Aquifer INFORMATION
c AquiferID = Unique Aquifer identifier
c AquiferNAME = Aquifer name
c Initial Storage = Initial Storage (ac-ft)
c RecessionCoef = Recession Coefficient (1/hr)
c SeepageCoef
              = Seepage Coefficient (1/hr)
c AquiferID AquiferNAME
                         InitialStorage RecessionCoef SeepageCoef
C-----
c713 Aquifer Pollutant Background Concentration
c AquiferID = Unique Aquifer identifier as in c712
c Ci = Background concentration for pollutant i (mg/1)
           Where i = 1 to N (N = Number of QUAL from card 705)
C
c AQUIFER_ID QUALC1 QUALC2 ... QUALCN
C------
c715 BMP SITE INFORMATION
c BMPSITE = Unique BMP site identifier
c BMPNAME = BMP template name or site name
c BMPTYPE = Unique BMP Types (must use the exact same keyword)
(BIORETENTION, WETPOND, CISTERN, DRYPOND, INFILTRATIONTRENCH, GREENROOF, POROUSPAVEMENT, RAINBARREL, REGULATOR, SWALE, CON
DUIT,BUFFERSTRIP,AREABMP)
c DArea = Total Drainage Area in acre
c NUMUNIT = Number of BMP structures
c DDAREA = Design drainage area of the BMP structure (acre)
c PreLUType = Predevelopment land use type (for external land simulation option)
c AquiferID = Unique Aquifer ID, 0 --- no aquifer (for external land simulation option)
c FtableFLG = Ftable flag, 0 = no, 1 = yes (for BMP Class A, B, and C)
c FTABLE_ID = Unique Ftable identifier (continuous string) as in card 714
             BMPNAME BMPTYPE DArea NUMUNIT DDAREA PreLUType
                                                                         FtableFLG FTABLE_ID
c BMPSITE
out SubwatershedOutlet JUNCTION 0 1 0 1 0
                                                                         0 No
TBDBMP BioretentionTypel BIORETENTION 0

DW_6665 BioretentionType1
                                                                         No
0
                                               0
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                                               1
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                                                                                 Nο
DW_6665 BioretentionType1
                         INFILTRATIONTRENCH 1
                                                     1
                                                                                               Ω
                                                           0
                                                                   1
DW_6671 BioretentionType1
                         INFILTRATIONTRENCH
                                                                   1
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                                                                                       No
No
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DW_6673 BioretentionType1
                           INFILTRATIONTRENCH
                                               1
                                                      1
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DW_6674 BioretentionType1
                          INFILTRATIONTRENCH
                                               1
                                                     1
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                                                                                       No
                                                     1
                                              1
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                                                                                       No
DW_6675 BioretentionType1
                          INFILTRATIONTRENCH
                                                                    1
                                                                                0
                                                                                               0
DW_6684 BioretentionType1
                           INFILTRATIONTRENCH
                                               1
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                                                                                        No
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DW_6839 BioretentionType1
                           INFILTRATIONTRENCH
                                               1
                                                                    1
                                                                                 0
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DW_6844 BioretentionType1
                          INFILTRATIONTRENCH
                                                           0
                                                                                       No
                                                           0
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0
DW_6850 BioretentionType1
                           INFILTRATIONTRENCH
                                               1
                                                                                      No
No
                                                                                               Ω
                                                     1
DW_6856 BioretentionType1
                           INFILTRATIONTRENCH
                                               1
                                                      1
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                                              1
                                                                         0
                                                                                       No
DW_6859 BioretentionType1
                           INFILTRATIONTRENCH
                                                     1
                                                           0
                                                                  1
                                                                                0
                                                                                             0
DW_6861 BioretentionType1 INFILTRATIONTRENCH 1 sewer Sewer JUNCTION 0 1 0 1
                                                     1
0
                                                          0
                                                                         0
                                                                  1
                                                                               0
                                                                                      No
                                                                                             0
sewer Sewer JUNCTION
                          0 1 0
                                                                   0
C-----
c720 Point Source Definition
c point source timeseries data must be in this order; flow (in.-acre/timestep), pollutant 1 (lbs/timestep),
pollutant2, ...
C
c POINTSOURCE
             = Unique point source identifier
c DESCRIPTION = point source description (a continuous string without any space)
c BMPSITE = BMP site identifier in card 715 c MULTIPLIER = Multiplier applied to the timeseries file (flow and pollutants). It will be in addition to
the pollutant multiplier in card 705
c TIMESERIESFILE = File name containing input timeseries
            = The fraction of total sediment which is sand (0-1)
c SAND_FRAC
c SILT_FRAC
               = The fraction of total sediment which is silt (0-1)
              = The fraction of total sediment which is clay (0-1)
c CLAY_FRAC
```

```
c POINTSOURCE BMPSITE MULTIPLIER TIMESERIESFILE SAND_FRAC SILT_FRAC
                                                                    CLAY_FRAC
     Inflow_1 DW_6665 1 6665.out 0 0 Inflow_2 DW_6671 1 6671.out 0 0
1
     Inflow_2
2
                                                         Ω
               DW_6671 1

DW_6673 1

DW_6674 1

DW_6675 1

DW_6684 1

DW_6839 1

DW_6844 1
                                          0
                              6673.out
3
     Inflow_3
                              6674.out
                                                 0
4
     Inflow_4
5
      Inflow_5
                               6675.out
                                            0
                                                 0
     Inflow_6
                              6684.out
                                           0
6
    DW_6839 1
DW_6844 1
DW_6850 1
DW_6856 1
DW_6856 1
DW_6859 1
DW_6859 1
DW_6859 1
DW_6859 1
                                                 0
7
                              6839.out
                                          0
                              6844.out
6850.out
                                                 0
8
                                            0
                                           0
9
                 DW_6856 1 6856.out 0 0
DW_6859 1 6859.out 0 0
DW_6861 1 6861.out 0 0
10
                                                       0
11
12
                                                        0
C-----
c721 Tier-1 Watershed Outlets Definition
C
          = BMP site (watershed outlet) identifier in card 715
c BMPSITE
c NUMBREAKS = Number of break points on the cost-effectiveness curve
c CECurveFile = CECurve_Solutions file for the project cost (sorted cost value) of each break point
            NUMBREAKS
                        CECurveFile
c BMPSITE
C------
c722 Tier-1 Watershed Timeseries Definition
c BMPSITE
              = BMP site (watershed outlet) identifier in card 721
c BREAKPOINTID = Unique break point id on cost-effectiveness curve
c TIMESERIESFILE = Timeseries output file corresponding to the breakpoint id
c BMPSITE
           BREAKPOINTID MULTIPLIER TIMESERIESFILE
C------
c723 Pump Curve (applies if PUMP_FLG is ON in card 725)
c PUMP_CURVE = The unique name of pump curve (continuous string without space)
c NUM_RECORD = Number of points on the curve
C
c DEPTH = Depth (ft)
c FLOW = Pumping flo
c FLOW
          = Pumping flow rate (cfs)
C
c PUMP_CURVE NUM_RECORD
c DEPTH FLOW
Qinf_6665
0 8
50 8
Qinf_6671
0 4.8
50 4.8
Qinf_6673
            2
0 7.2
50 7.2
50
Qinf_6674
            2
0 4.8
50 4.8
Qinf_6675
0 2.4
50 2.4
Qinf_6684
0.8
50
      0.8
Qinf_6839
0 22.4
50 22.4
50
Qinf_6844
0 10.4
50 10.4
Qinf_6850
            2
   31.2
31.2
0
50
Qinf_6856
  11.2
11.2
Ω
50
Qinf_6859
0 32
50 32
Qinf_6861
            2
```

```
19.2
50
     19.2
c725 CLASS-A BMP Site Parameters (required if BMPSITE is CLASS-A in card 715)
c BMPSITE = Class A BMP dimension group identifier in card 715
c WIDTH = Basin bottom width (ft)
c LENGTH = Basin bottom length (ft) / diameter (ft) for rain barrel or cistern
c OHEIGHT = Orifice Height (ft)
c DIAM = Orifice Diameter (in)
c CCOEF = Contraction Coefficient, user-specified value between 0 and 1 (e.g., Rounded = 1.0, Short Tube =
0.8, Sharp-edged = 0.61, Borda = 0.5)
c RELTP = Release Type (1-Cistern, 2-Rain barrel, 3-others)
c PEOPLE = Number of persons (Cistern Option)
c DDAYS = Number of dry days (Rain Barrel Option)
c WEIRTP = Weir Type (1-Rectangular, 2-Triangular)
c WEIRH = Weir Height (ft)
c WEIRW = (weir type 1) Weir width (ft)
c THETA
       = (weir type 2) Weir angle (degrees)
c ET_MULT = multiplier to PET
c PUMP_FLG = pump option (0-OFF, 1-ON)
c DEPTH_ON = water Depth (ft) at which the pump is started
c DEPTH_OFF = water Depth (ft) at which the pump is stopped
c PUMP_CURVE = The unique name of pump curve (continuous string without space)
c BYPASS_FRAC = Fraction of inflow that bypasses the BMP when full (0.0-1.0)
c DIV_RATE = Maximum flow diversion rate into BMP (cfs)
c BMPSITE WIDTH LENGTH OHEIGHT DIAM
                                      EXITYPE RELEASETYPE PEOPLE DDAYS WEIRTYPE WEIRH WEIRW THETA
ET_MULT PUMP_FLG DEPTH_ON DEPTH_OFF PUMP_CURVE BYPASS_FRAC
                                                          DIV_RATE
TBDBMP 0 0 0 0 0.61 3 0 0 0 0.1
                                             Ω
                                                    0
                                                           1
                                                                        10000
DW_6665 10 7.16 5 1
                  none 0 -1
0 0.1 0.61
                                       3
                                                           1
                                                                 45
                                                                        10000
                                                                                            1
            1 Qinf_6665
4.29 0 0.1
                               0
                                       -1
                         0.1
DW_6671 10
                                0.61
                                              0
                                                    0
                                                           1
                                                                 45
                                                                        10000
                                                                                     0
            1
                   Qinf_6671
                                0
                                       -1
     5
DW_6673 10
           6.44 0 0.1
                                0.61
                                       3
                                              0
                                                    0
                                                           1
                                                                 45
                                                                        10000
                                                                              0
                                                                                     0
                                                                                            1
5 1 Qinf_6673
DW_667410 4.29 0 0.1
                                0
                                       -1
                                0.61
                                       3
                                              Ω
                                                    Ω
                                                           1
                                                                 45
                                                                        10000
                                                                              0
                                                                                     Ω
                                                                                            1
                   Qinf_6674
           1
                                0
                                       -1
DW_6675 10
           2.15 0 0.1
                                                    Ω
                                                                        10000
                                                                                     Ω
                                0.61
                                       3
                                             Ω
                                                           1
                                                                 45
                                                                              Ω
                                                                                            1
      5
             1
                   Qinf_6675
                                0
                                       -1
DW_6684 10
           0.72
                   0 0.1
                                0.61
                                       3
                                             0
                                                    0
                                                           1
                                                                 45
                                                                        10000
                                                                              0
                                                                                     0
                                                                                            1
     5
           1
                   Qinf_6684
                                0
                                       -1
DW_6839 10
            20.04 0 0.1
                                0.61
                                             0
                                                    0
                                                                        10000 0
                                       3
                                                           1
                                                                 45
                                                                                     0
                                                                                            1
    5
             1
                   Qinf_6839
                                0
                                       -1
                   0 0.1
DW_6844 10
           9.30
                                0.61
                                       3
                                                    0
                                                           1
                                                                 45
                                                                        10000 0
                                                                                            1
                   Qinf_6844
     5
            1
                                0
                                       -1
DW_6850 10
             27.91
                   0
                         0.1
                                0.61
                                       3
                                                    0
                                                           1
                                                                 45
                                                                        10000
                                                                                     0
             1
                   Qinf_6850
     5
                                Ω
                                       -1
DW_6856 10
           10.02
                   0 0.1
                                0.61
                                       3
                                             Ω
                                                    Ω
                                                           1
                                                                 45
                                                                        10000
                                                                              Ω
                                                                                     Ω
                                                                                            1
1 Qinf_6856
28.62 0 0.1
                                0
                                       -1
                                0.61
                                       3
                                              Ω
                                                    0
                                                           1
                                                                 45
                                                                        10000
                                                                              0
                                                                                     0
                                                                                            1
                               0
                                       -1
DW_6861 10 17.17 0 0.1 0.61 3
```

0

1

45

10000 0

0

1

0

c730 Cistern Control W	Vater Release Curve (ag	pplies if release type	is cistern in card 725)

-1

c BMPSITE = Class A BMP dimension group identifier in card 715 c Flow = Hourly water release per capita from the Cistern Control (ft3/hr/capita)

0

5

1 Qinf_6861

c BMPSITE	FLOW												
TBDBMP 0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0				
DW_6665 0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0				
DW_6671 0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0				
DW_6673 0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0				
DW_6674 0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0				
DW_6675 0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0				
DW_6684 0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0				

```
DW_6839 0
                                                                                               0
   0
             0
                                 0
                                       0
                  0
                          Ω
                                               Λ
                                                      Ω
                                                             Ω
                                                                    Ω
DW_6844 0
                    Ω
                           0
                                 Ω
                                        Ω
                                               0
                                                      Ω
                                                             Ω
                                                                                               0
             0
                  0
                                 0
                                       0
   0
                          Ω
                                               Ω
                                                     Ω
                                                            Ω
                                                                   Ω
DW_6850 0
                  0
                                0
                                              0
                                                                                               0
                         0
             0
                  0
                                             0
                                                     0
                                                           0
      0
                 0 0
0 0
0 0
0 0
                                0
                                       0
                                                                   0
DW_6856 0
                                 0
                                        0
                                                                          0
                                                                                 0
                                                                                        0
             0
                                               0
                                                            0
                                                                    0
                                                                                               0
             0
                                0
                                                     0
                                       0
                                              0
                                                            0
     0
                                                                   0
  DW_6859 0
                                                                         0
                                                                                 0
                                                                                        0
                                                                                               0
DW_6861 0
                                                                         0
                                                                                 0
                                                                                        0
                                                                                               0
C------
c735 CLASS B BMP Site DIMENSION GROUPS
c BMPSITE = BMP Site identifier in card 715
c WIDTH
         = basin bottom width (ft)
c LENGTH = basin bottom Length (ft)
c MAXDEPTH = Maximum depth of channel (ft)
c SLOPE1 = Side slope 1 (ft/ft)
        = Side slope 2 (ft/ft)
c SLOPE2
c SLOPE3 = Side slope 3 (ft/ft)
c MANN_N = Manning 's roughness coefficient
c ET_MULT = multiplier to PET
C
             WIDTH LENGTH MAXDEPTH SLOPE1 SLOPE2 SLOPE3 MANN_N ET_MULT
c BMPSITE
C------
c740 BMP Site BOTTOM SOIL/VEGITATION CHARACTERISTICS
C
c BMPSITE
          = BMPSITE identifier in c715
c INFILTM = Infiltration Method (0-Green Ampt, 1-Horton, 2-Holtan)
c POLROTM = Pollutant Routing Method (1-Completely mixed, >1-number of CSTRs in series)
c POLREMM = Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method, 2-user defined
concentration)
c SDEPTH = Soil Depth (ft)
c POROSITY = Soil Porosity (0-1)
c FCAPACITY = Soil Field Capacity (ft/ft)
c WPOINT = Soil Wilting Point (ft/ft)
c AVEG = Vegetative Parameter A (0.1-1.0) (Empirical), only required for Holtan infiltration method c FINFILT = Soil layer infiltration rate (in/hr) c UNDSWITCH = Underdrain option (0-No underdrain, 1-underdrain with percent removal rate, 2-underdrain with
constant effluent conc.)
c UNDDEPTH = Depth of storage media below underdrain (ft)
c UNDVOID = Fraction of underdrain storage depth that is void space (0-1)
c UNDINFILT = Background infiltration rate, below underdrain (in/hr)
c SUCTION = Average value of soil capillary suction along the wetting front, value must be greater than zero
(in), only required for Green-Ampt infiltration method
c IMDMAX = Difference between soil porosity and initial moisture content, value must be greater than or
equal to zero (a fraction), only required for Green-Ampt infiltration method
c MAXINFILT = Maximum rate on the Horton infiltration curve (in/hr), only required for Horton infiltration
method
c DECAYCONS = Decay constant for the Horton infiltration curve (1/hr), only required for Horton infiltration
c DRYTIME = Time for a fully staurated soil to completely dry (day), only required for Horton infiltration
met.hod
c MAXVOLUME = Maximum infiltration volume possible (in), only required for Horton infiltration method
c BMPSITE INFILTM POLROTM POLREMM SDEPTH POROSITY
                                                  FCAPACITY WPOINT AVEG
                                                                          FINFILT UNDSWITCH UNDDEPTH
UNDVOID UNDINFILT SUCTION IMDMAX MAXINFILT DECAYCONS DRYTIME MAXVOLUME
                  0
                       2
                                                                          1.5
TBDBMP 2 1
                                0.35
                                       0.3
                                             0.15
                                                      0.6
                                                           1
                                                                   Ω
                                                                                 0.4
                                                                                        1
                                                                                               0
                           7
                                 0
      0
             3
                    4
            1
                  0
DW_6665 2
                                                             0
                                                                          1
                          Ω
                                 0.4
                                        0.3
                                               0.15
                                                      Ω
                                                                    Ω
                                                                                 0.4
                                                                                        0.75
                                                                                               Ω
            3
                         7
     0
                  4
                                 0
             1
3
1
                  0
DW_6671 2
                          0
                                 0.4
                                        0.3
                                             0.15
                                                     0
                                                           0
                                                                   0
                                                                          1
                                                                                 0.4
                                                                                        0.75
                                                                                               0
                           7
                                 0
    0
                    4
                  0
DW_6673 2
                                                                    0
                          0
                                 0.4 0.3
                                             0.15
                                                    0
                                                             0
                                                                          1
                                                                                 0.4
                                                                                        0.75
                                                                                               0
                 4
      0
             3
                          7
                                 0
             1 3
                  0
4
DW_6674 2
                          0
                                 0.4
                                        0.3
                                               0.15
                                                      0
                                                             0
                                                                    0
                                                                          1
                                                                                 0.4
                                                                                        0.75
                                                                                               0
                         7
      0
                                 0
```

0.15

0.15

0

0

0

0

0

0

0

0

0

0

0

1

1

1

1

0.4

0.4

0.4

0.75

0.75

0.75

0.75

0

0

0

0

Ω

Ω

0

Ω

DW_6675 2

0 DW_6684 2

DW_6839 2

0 DW_6844 2

0

0

0

0.4

0.4

0.3

0.4 0.3 0.15

0.4 0.3 0.15 0

0

0

0

```
DW_6850 2 1 0 0
0 3 4 7
DW_6856 2 1 0 0
0 3 4 7
DW_6859 2 1 0 0
0 3 4 7
DW_6861 2 1 0 0
0 3 4 7
                                              0.4 0.3 0.15 0
                                                                                    0
                                                                                                                 0.4 0.75
                                     7 0 0 0.4 0.3 0.15 0 7 0 15 0
                                                                                    0
                                                                                                        1 0.4
                                                                                                                            0.75
                                              0.4 0.3 0.15 0
                                    0
                                                                                       0
                                                                                                0
                                                                                                        1
                                                                                                                 0.4 0.75
                                              0
                                               0.4 0.3
                                                                   0.15
                                                                           0
                                                                                       0
                                                                                                0
                                                                                                          1
                                                                                                                             0.75
                                              0
C------
c745 BMP Site HOLTAN GROWTH INDEX
c HOLTAN EQUATION: F = GI * AVEG * (Computed Available Soil Storage) ^{^{\circ}} 1.4 + FINFILT
c BMPSITE = BMPSITE identifier in card 715
c {\tt GIi} = 12 monthly values for {\tt GI} in {\tt HOLTAN} equation
С
               Where i = jan, feb, mar...dec
c BMPSITE jan feb mar apr may jun jul aug sep oct nov dec
             TBDBMP 0

      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
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      0
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      0
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      0

                                                                                      0
DW_6665 0
                          0 0
0 0
0 0
0 0
                 0
DW_6671 0
DW_6673 0
                 0
                                                                                                                    0
                DW_6674 0
                                                                                                                    0
DW_6675 0
                                                                                                                    0
DW_6684 0
DW_6839 0
                                                                                                                   Ω
DW_6844 0
DW_6850 0
                                                                                                                   0
DW_6856 0
                0
DW_6859 0 0 0 0
DW_6861 0 0 0 0
                                                                                                                    0
                                                                                                                   0
 _____
c747 BMP Site Initial Moisture Content
c BMPSITE = BMP Site identifier in card 715
c WATDEP_i = initial surface water depth (ft)
c THETA_i = initial soil moisture (ft/ft)
C BMPSITE WATDEP_i THETA_i
TBDBMP 0 0.15
DW_6665 0 0.15
DW_6671 0
                 0.15
                 0.15
0.15
DW_6673 0
DW_6674 0
DW_6675 0
                 0.15
DW_6684 0
                 0.15
DW_6839 0
                   0.15
DW_6844 0
                 0.15
DW_6850 0
                 0.15
DW_6856 0
                  0.15
DW_6859 0
                  0.15
DW_6861 0 0.15
c750 Class-C Conduit Parameters (required if BMPSITE is CLASS-C in card 715)
c BMPSITE
                 = BMP site identifier in card 715
c INLET_NODE = BMP Id at the entrance of the conduit
c OUTLET_NODE = BMP Id at the exit of the conduit
c LENGTH = Conduit length (ft)
c MANNING_N = Manning's roughness coefficient
c INLET_IEL = Invert Elevation at the entrance of the conduit (ft)
c OUTLET_IEL = Invert Elevation at the exit of the conduit (ft)
c INIT_FLOW = Initial flow in the conduit (cfs)
c INLET_HL
                 = Head loss coefficient at the entrance of the conduit
c OUTLET_HL = Head loss coefficient at the exit of the conduit
c AVERAGE_HL = Head loss coefficient along the length of the conduit
С
                  INLET_NODE OUTLET_NODE
                                                         LENGTH MANNING_N
                                                                                     INLET IEL
                                                                                                        OUTLET IEL
                                                                                                                           INIT FLOW
    INLET_HL OUTLET_HL AVERAGE_HL
C-----
c755 Class C Conduit Cross Sections
c LINK
            = BMP site identifier in card 715
c TYPE
            = Conduit Type (rectangular, circular...)
c GEOM1 = Geometric cross-sectional property of the conduit
```

```
c GEOM2 = Geometric cross-sectional property of the conduit
c GEOM3 = Geometric cross-sectional property of the conduit
c GEOM4
             = Geometric cross-sectional property of the conduit
c BARRELS = Number of Barrels in the conduit
c LINK TYPE
                  GEOM1 GEOM2 GEOM3 GEOM4 BARRELS
c760 Irregular Cross Sections
C
c Format of transect data follows:
c NC nLeft nRight nChannel
        name nSta xLeftBank
                                                     xRightBank 0
                                                                                  0
                                                                                             0
c X1
                                                                                                         xFactor yFactor
         Elevation
                               Station ...
C-----
c761 BufferStrip BMP Parameters (required if BMPTYPE is BUFFERSTRIP in card 715)
c BMPSITE = BMP site identifier in card 715
c Width
                = BMP width (ft)
c FLength = Flow length (ft)
c DStorage = Surface depression storage (in)
c SLOPE = Overland slope (ft / ft)
c MANNING_N = Overland Manning's roughness coefficient
c POLREMM = Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method)
c ET_MULT = Multiplier to PET
C
                    Width FLength DStorage
                                                              SLOPE MANNING_N
                                                                                              POLREMM ET MULT
C------
c762 Area BMP Parameters (required if BMPTYPE is AREABMP in card 715)
c BMPSITE
                    = BMP site identifier in card 715
c Area
                    = BMP area (ft2)
c FLength
                     = flow length (ft) note: area width = area / flow length
c DStorage = Surface depression storage (in)
c SLOPE
                   = Overland slope (ft / ft)
c MANNING N
                    = Overland Manning's roughness coefficient
c SAT_INFILT = Saturated infiltration rate (in/hr)
c POLREMM = Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method) c DCIA = Percentage of Directly Connected Impervious Area (0-100)
c TOTAL_IMP_DA = Total Impervious Drainage Area (acre)
C
                    Area FLength DStorage
                                                               SLOPE MANNING N
                                                                                              SAT INFILT
                                                                                                                    POLREMM DCIA TOTAL IMP DA
C-----
c765 BMP SITE Pollutant Decay/Loss rates
c BMPSITE
                  = BMP site identifier in card 715
c QUALDECAYi = First-order decay rate for pollutant i (hr^-1)
                    Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
C
                QUALDECAY1
c BMPSITE
                                         QUALDECAY2 ... QUALDECAYN
TBDBMP 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333
0.008333333
                                                                                                                     0.008333333
                                                                                                                                           0.008333333
                                                                                                                   0.008333333
                                                                                               0.008333333
                                                                                                                                           0.008333333
\texttt{DW\_}6674 \ 0.008333333 \\ 0.008333333 \ 0.008333333 \ 0.008333333 \ 0.008333333 \\ 0.008333333 \ 0.008333333 \ 0.008333333 
0.008333333
                                                                                                                                           0.008333333
\mathsf{DW}\_6844\ 0.008333333 \qquad 0.0083333333 \qquad 0.0083333333 \qquad 0.008333333 \qquad 0.0083333333 \qquad 0.008333333 \qquad 0.0083333333 \qquad 0.008333333 
0.008333333
0.008333333
                                                                                                0.008333333
                                                                                                                                           0.008333333
                                                                                                0.008333333
                                                                                                                                           0.008333333
c766 Pollutant K' values (applies when pollutant removal method is kadlec and knight method in card 740)
c BMPSITE = BMP site identifier in card 715
C QUALK'i = Constant rate for pollutant i (ft/yr)
                Where i = 1 to N (N = Number of QUAL from card 705)
C
c BMPSITE
                    QUALK'1 QUALK'2 ... QUALK'N
C------
c767 Pollutant C* values (applies when pollutant removal method is kadlec and knight method in card 740)
```

```
c BMPSITE = BMP site identifier in card 715
c QUALC*i = Background concentration for pollutant i (mg/l)
C
         Where i = 1 to N (N = Number of QUAL from card 705)
C
c BMPSITE
          QUALC*1 QUALC*2 ... QUALC*N
C-----
c768 Pollutant C values (applies when surface release type is 4 in card 725)
c BMPSITE = BMP site identifier in card 715
c QUALCi = Constant surface release concentration for pollutant i (mg/l)
         Where i = 1 to N (N = Number of QUAL from card 705)
C
C
c BMPSITE
            QUALC1 QUALC2 ... QUALCN
           0 0 0 0
TBDBMP 0
                                   0
DW_6665 0
           Ω
                  Ω
                        Ω
                              Ω
                                           Ω
DW_6671 0
            Ω
                  Ω
                        Ω
                              Ω
                                    Ω
                        0
           0
                                    0
DW_6673 0
                 Ω
                              Ω
                                          0
DW_6674 0
           0
                 0
                       0
                             0
                                    0
                 0
                       0
                             0
                                    0
DW_6675 0
           0
                                           0
DW_6684 0
            0
                  0
                        0
                              0
                                    0
           0
                 0
                       0
                             0
                                    0
DW_6839 0
                                          0
                 0
                       0
                             0
DW_6844 0
           0
                                   0
           0
                 0
0
                       0
0
                             0
0
                                   0
0
DW_6850 0
                                          0
DW_6856 0
                                           Ω
DW_6859 0
                 0
                       0
                                    0
           0
                 0
                              0
DW_6861 0
                       0
                                    Ω
                                           Ω
c770 BMP Underdrain Pollutant Percent Removal (applies when underdrain option is "1" in card 740)
C
c BMPSITE
           = BMPSITE identifier in card 715
c QUALPCTREMi = Perecent Removal for pollutant i through underdrain (0-1)
            Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
C
С
c BMPSITE
           OUALPCTREM1
                        QUALPCTREM2 ... QUALPCTREMN
TBDBMP 0
           0 0
                       0 0 0
                                   0
DW_6665 0
           0
                  0
                        0
                              0
                                           0
                 0
DW_6671 0
           Ω
                        Ω
                              Ω
                                           Ω
                 0
DW_6673 0
           0
                       0
                             0
                                           0
                 0
                       0
                              0
DW_6674 0
           Ω
                                   0
                                          0
DW_6675 0
            0
                 0
                        0
                              0
                                    0
                                           0
                 0
                                   0
DW_6684 0
           0
                        0
                              0
                                          0
DW_6839 0
           0
                 0
                       0
           0
DW_6844 0
                 0
0
                       0
                             0
                                   0
                                          Ω
DW_6850 0
            0
                        0
                              0
                                           0
DW_6856 0
           0
                 0
                       0
                             0
                                   0
                                           0
                                   0
            0
                       0
                             0
DW_6859 0
                 0
                                           Ω
DW_6861 0
            0
                 0
                       0
                              0
                                    0
                                           0
C-----
c771 BMP Underdrain Pollutant Effluent Concentration (applies when underdrain option is "2" in card 740)
c BMPSITE
           = BMPSITE identifier in card 715
c QUALEFFCi = Underdrain effluent concentration for pollutant i (mg/l)
C
            Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
С
           QUALEFFC1
                       QUALEFFC2 ... QUALEFFCN
c BMPSITE
TBDBMP 0
           0 0
                        0 0 0
                                        0
DW_6665 0
            0
                  0
                        0
                              0
                                    0
                                           0
                                   0
DW_6671 0
           0
                 0
                       0
                             0
                                           0
                                    0
           0
                 0
                       0
DW_6673 0
                             0
                                           Ω
DW_6674 0
            0
                 0
                        0
                              0
                                    0
                 0
DW_6675 0
                       0
                             0
                                    0
           Ω
                                          Ω
DW_6684 0
            0
                 0
                       0
                              0
                                    0
                              0
           0
                       0
DW_6839 0
                 0
                                    0
                                          0
DW_6844 0
            0
                  0
                        0
                              0
                                    0
                                           0
           0
                 0
                                   0
DW 68500
                       0
                              0
                                           0
                                   0
                       0
                             0
DW_6856 0
           0 0
                                           0
DW_6859 0
            0
                 0
                        0
                              0
                                     0
                                           0
                              0
DW_6861 0
            0
                 0
                        0
                                     0
                                           0
c775 Sediment General Parameters (required if pollutant type is sediment in card 705)
c BMPSITE = BMP site identifier in card 715
c BEDWID = Bed width (ft) - this is constant for the entire simulation period
c BEDDEP = Initial bed depth (ft)
c BEDPOR = Bed sediment porosity
```

```
c BMPSITE
           BEDWID BEDDEP BEDPOR
c780 Sand Transport Parameters (required if pollutant type is sediment in card 705)
c BMPSITE = BMP site identifier in card 715
c D = Effective diameter of the transported sand particles (in)
c W
        = The corresponding fall velocity in still water (in/sec)
c RHO
        = The density of the sand particles (lb/ft3)
c KSAND = The coefficient in the sandload power function formula
c EXPSND = The exponent in the sandload power function formula
C
                  W
                         RHO
                                KSAND EXPSND
C------
c785 Silt Transport Parameters (required if pollutant type is sediment in card 705)
c BMPSITE = BMP site identifier in card 715
c D
c W
        = Effective diameter of the transported silt particles (in)
        = The corresponding fall velocity in still water (in/sec)
c RHO
        = The density of the silt particles (lb/ft3)
c TAUCD = The critical bed shear stress for deposition (lb/ft2)
c TAUCS = The critical bed shear stress for scour (lb/ft2)
с М
    = The erodibility coefficient of the silt particles (lb/ft2/day)
C
c BMPSITE
            D
                  W
                        RHO TAUCD TAUCS M
c786 Clay Transport Parameters (required if pollutant type is sediment in card 705)
C
c BMPSITE = BMP site identifier in card 715
c D = Effective diameter of the transported clay particles (in)
c W
        = The corresponding fall velocity in still water (in/sec)
        = The density of the silt/clay particles (lb/ft3)
c RHO
c TAUCD = The critical bed shear stress for deposition (lb/ft2)
c TAUCS = The critical bed shear stress for scour (lb/ft2)
      = The erodibility coefficient of the clay particles (lb/ft2/day)
с М
c BMPSITE
           D
                  W
                        RHO
                              TAUCD TAUCS M
c790 LAND TO BMP ROUTING NETWORK
c UniqueID = Identifies an instance of LANDTYPE in SCHEMATIC
c LANDTYPE = Corresponds to LANDTYPE in c710
c AREA = Area of LANDTYPE in ACRES
c DS
        = UNIQUE ID of DS BMP (0 - no BMP, add to end)
c LCGID = Land Control Group Identifier in card 711 (0 - no change)
           LANDTYPE
                         AREA DS
c UniqueID
                                      LCGID
C------
c795 BMP Site ROUTING NETWORK
           = BMPSITE identifier in card 715
c OUTLET_TYPE = Outlet type (1-total, 2-weir, 3-orifice or channel, 4-underdrain, 5-untreated)
       = Downstrem BMP site identifier in card 715 (0 - no BMP, add to end)
c DS
C
c BMPSITE
           OUTLET_TYPE
                        DS
           out
ut 1
out
      1
            0
TBDBMP 1
            out
sewer 1
            out
DW_6665 2
DW_6671 2
            ut
DW_6673 2
             ut
DW_6674 2
            ut
DW_6675 2
DW_6684 2
            ut
DW_6839 2
             ut
DW_6844 2
            ut
DW_6850 2
            11±
DW_6856 2
DW_6859 2
            ut
DW_6861 2
DW_6665 3
            sewer
DW 66654
             sewer
DW_6665 5
            out
```

```
DW_6671 3
               sewer
DW_6671 4
              sewer
DW_66715
               out
DW_6673 3
               sewer
DW_6673 4
               sewer
DW_66735
               out
DW_6674 3
                sewer
DW 66744
               sewer
DW_66745
               out
DW_6675 3
               sewer
DW_6675 4
               sewer
DW_6675 5
               out
DW_6684 3
               sewer
DW_66844
                sewer
DW_66845
               out
DW_6839 3
               sewer
DW_6839 4
               sewer
DW_6839 5
               out
DW_6844 3
               sewer
DW_6844 4
               sewer
DW_6844 5
               out
DW 68503
               sewer
DW_6850 4
               sewer
DW_6850 5
               out
DW_6856 3
               sewer
DW_68564
               sewer
DW_68565
              out
DW_6859 3
               sewer
DW_6859 4
               sewer
DW_68595
              out
DW_6861 3
               sewer
DW_6861 4
                sewer
DW_6861 5
               out
c800 Optimization Controls
c Technique -- Optimization Techniques
С
      0 = no optimization
C
      2 = NSGAII
c Option -- Optimization options
   0 = no optimization
      1 = specific control target and minimize cost
C
   2 = generate cost effectiveness curve
c StopDelta -- Criteria for stopping the optimization iteration c in dollars($), meaning if the cost not improved by this criteria, stop the search (for Option 1)
c MaxRuns -- Maximum number of iterations (should be greater than 4times the number of decision variables in
card 711 and 810)
c NumBest -- Number of best solutions for output (for Option 1)
c Technique Option StopDelta
                                       MaxRuns NumBest
0 2 0 10000 1
c805 BMP Cost Functions
c Cost ($) = ((LinearCost)*Length^(LengthExp) + (AreaCost)*Area^(AreaExp) +
(TotalVolumeCost)*TotalVolume^(TotalVolExp)
    + (MediaVolumeCost)*SoilMediaVolume^(MediaVolExp) +
(UnderDrainVolumeCost) *UnderDrainVolume^(UDVolExp)
    + (ConstantCost)) * (1+PercentCost/100)
= BMP site identifier in card 715

c LinearCost = Cost per unit length of the card 715
c LinearCost = Cost per unit length of the BMP structure ($/ft^2)
c TotalVolumeCost = Cost per unit total volume of the BMP structure ($/ft^3)
c MediaVolumeCost = Cost per unit volume of the soil media ($/ft^3)

= Cost per unit volume of the soil media ($/ft^3)
                        = Cost per unit length of the BMP structure ($/ft)
c UnderDrainVolumeCost = Cost per unit volume of the under drain structure ($/ft^3)
= Exponent for linear unit
= Exponent for area unit
c LengthExp
c AreaExp
                      = Exponent for total volume unit
= Exponent for soil media volume unit
c TotalVolExp
c MediaVolExp
c UDVolExp
                        = Exponent for underdrain volume unit
C
c BMPSITE LinearCost AreaCost
                                              TotalVolumeCost
                                                                     MediaVolumeCost UnderDrainVolumeCost
   ConstantCost PercentCost LengthExp AreaExp TotalVolExp MediaVolExp DBMP 0 0 0 0 0 0 1 1 1 1
                                                                                                UDVolExp
TBDBMP 0 0 0 0 DW 6665 0 0 12.6
                       1
                                               120000 0
```

```
      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0
      120000
      0
      1
      1

      0
      12.6
      0
      0</td
DW_6671 0
DW_6673 0
                                                                                                    1
                                                                                                      1
DW_6674 0
                                                                                                                           1
                                                                                                    1
                                                                                                              1
DW_6675 0
                                                                                                                           1
DW_6684 0
                                                                                                    1
DW_6839 0
                                                                                                              1
                                                                                                   1
                                                                                                                          1
                                                                                                    1
1
DW_6844 0
                                                                                                              1
DW 68500
                                                                                                                          1
DW_6856 0
                                                                                                              1
                                                                                                    1
                                                                                                                          1
DW_6859 0 0 12.6 0 0 DW_6861 0 0 12.6 0
                                                                                                      1
1
                                                                                                                1
                                                                                                                           1
                                                                                                                1
                                                                                                                           1
c-----
-----
c806 Diversion Structure Cost Function
c Cost ($) = ((DiversionCost)*DIV_RATE^(DiversionExp) + (ConstantCost)) * (1+PercentCost/100)
                              = BMP site identifier in card 715
c BMPSITE
                          = Cost per unit diversion rate ($/cfs)
= Exponent for diversion rate
c DiversionCost
c DiversionExp
c ConstantCost
                              = Constant cost ($)
                              = Cost in percentage of all other cost (%)
c PercentCost
c BMPSITE DiversionCost DiversionExp ConstantCost PercentCost
TBDBMP 0 1 0
DW_6665 25400 1 0
                                         Ω
                                         Ω
DW_6671 25400 1
                            0
                            0
DW_6673 25400 1
                                        Ω
DW_6674 25400
                    1
                              0
                            0
DW_6675 25400 1
                                        0
DW_6684 25400 1
                            0
                            0
DW_6839 25400 1
DW_6844 25400 1
DW 6839 25400
                                        0
                                        0
DW_6850 25400 1
                            0
DW_6856 25400 1
                            0
                                       0
DW_6859 25400
                    1
                              0
DW_6861 25400 1
                             0
                                         Ω
C-----
c810 BMP SITE Adjustable Parameters
c BMPSITE = BMP site identifier in card 715
c VARIABLE = Variable name (must use the exact same keyword)
                 LENGTH --- BMP length,
C
                 NUMUNIT --- number of units,
                WEIRH --- weir height,
SDEPTH --- soil media depth,
C
C
               DCIA --- directly connected impervious area for area BMP type,
                MAXDEPTH --- maximum surface storage depth for swale,
C
                CECURVE --- cost-effectiveness curve for Tier-1 solution
С
               DIV_RATE --- maximum flow diversion rate into BMP
C
c FROM = From value in the range
c TO = To value in the range c STEP = Increment
C
                  VARIABLE FROM TO STEP
H 0 0 0
H 0 10 0.05
c BMPSITE
TBDBMP LENGTH 0 0
DW_6665 LENGTH 0
DW_6671 LENGTH 0 10 0.05
                                   0.05
DW_6673 LENGTH 0
DW_6674 LENGTH 0
                            10
10
                                        0.05
                           10
DW_000/5 LENGTH 0 10 0.05
DW_6684 LENGTH 0 10 0.05
DW_6839 LENGTH 0 10 0.05
DW_6844 LENGTH 0 10 0.05
DW_6850 LENGTH 0 10 0.05
DW_6675 LENGTH 0
                                       0.05
DW_6856 LENGTH 0
DW_6859 LENGTH 0
                            10
10
                                       0.05
                                        0.05
DW_6861 LENGTH 0 10 0.05
C------
c814 Predeveloped Timeseries at Assessment Point for Flow Duration Curve
c BMPSITE = BMP site identifier in card 715 if it is an assessment point c NumBins = Number of bins for flow duration curve
c PreDevFlag = Pre-developed timeseries option (1-internal,2-external)
c PreDevFile = Pre-developed timeseries file path for external option
                    The timeseries file format (AssessmentPoint_ID Year
                                                                                                    Month Day
                                                                                                                          Hour
                                                                                                                                     Minute
C
          Flow_cfs)
```

```
The first line is skipped (comment line) and data start from the second line in the required
format.
C
c BMPSITE
             NumBins PreDevFlag
                                     PreDevFile
c815 Assessment Point and Evaluation Factor
c BMPSITE -- BMP site identifier in card 715 if it is an assessment point
c FactorGroup -- Flow or pollutant related evaluation factor group
     -1 = flow related evaluation factor
C
     # = pollutant ID in card 705
c FactorType -- Evaluation Factor Type (negative number for flow related and positive number for pollutant
    -1 = AAFV Annual Average Flow Volume (ft3/yr)
C
     -2 = PDF Peak Discharge Flow (cfs)
     -3 = FEF Flow Exceeding frequency (#times/year)
C
     -4 = FDC Flow Duration Curve (sum of sorted flow difference with pre-developed condition, cfs)
C
     1 = AAL Annual Average Load (lb/yr)
     2 = AAC Annual Average Concentration (mg/L)
3 = MAC Maximum #days Average Concentration (mg/L)
C
c FactorVal1 -- if FactorType = 3 (MAC): Maximum #Days;
             -- if FactorType = -3 (FEF): Threshold (cfs)
             -- if FactorType = -4 (FDC): Low flow limit (cfs)
C
             -- all other FactorType : -99
c FactorVal2 -- if FactorType = -3 (FEF): Minimum inter-exceedance time (hr)
С
                                           if = 0 then daily running average flow exceeding frequency
                                           if = -1 then daily average flow exceeding frequency
C
                                           otherwise minimum inter-exceedance time for simulation interval
C
             -- if FactorType = -4 (FDC): High flow limit (cfs)
С
             -- all other FactorType : -99
C
c CalcMode -- Evaluation Factor Calculation Mode
    -99 for Option 0 (card 800): no optimizaiton
C
     1 = % percent of value under existing condition (0-100)
C
C
      2 = S scale between pre-develop and existing condition (0-1)
     3 = V absolute value in the unit as shown in FactorType (third block in this card)
c TargetVall -- Target value for evaluation factor calculation mode
      -99 for Option 0 (card 800): no optimizaiton
C
C
      Target value for minimize cost Option 1 (card 800)
     Lower limit of target value for cost-effective curve Option 2 (card 800)
C
c TargetVal2 -- Target value for evaluation factor calculation mode
     -99 for Option 0 (card 800): no optimizaiton
      -99 for Option 1 (card 800): minimize cost
C
     Upper limit of target value for cost-effective curve Option 2 (card 800)
c Factor_Name -- Evaluation factor name (user specified without any space), e.g. FlowVolume or SEDIMENT
c BMPSITE
              FactorGroup
                              FactorType
                                           FactorVal1
                                                             FactorVal2
                                                                           CalcMode
                                                                                          TargetVal1
       TargetVal2 FactorName
       7
           1
                      -99
                            -99
                                                             PLS_TZn
out
      7
                                   1
                                            0
                      -99
                              -99
                                                     100
                                                             PLS TZn
ut
               1
TBDBMP 7
              1
                     -99
                              -99 1
                                                     100
                                            0
                                                          PLS TZn
                                            0
DW_66657
                      -99
                              -99
                                     1
1
               1
                                                     100
                                                             PLS_TZn
DW_6671 7
               1
                      -99
                              -99
                                                     100
                                                             PLS_TZn
DW 66737
                     -99
                              -99
                                      1
                                            0
                                                    100
                                                            PLS TZn
               1
                                   1
DW_66747
               1
                     -99
                              -99
                                            0
                                                    100
                                                             PLS_TZn
                                     1
1
                                            0
                              -99
DW_6675 7
               1
                      -99
                                                     100
                                                             PLS_TZn
DW_6684 7
                              -99
               1
                      -99
                                                     100
                                                             PLS TZn
DW_68397
                     -99
                              -99 1
                                            0
               1
                                                    100
                                                            PLS TZn
                                                    100
                                            0
0
DW_68447
                      -99
                              -99
                                    1
1
                                                             PLS_TZn
               1
                     -99
DW_68507
               1
                              -99
                                                     100
                                                             PLS_TZn

    -99
    1
    0
    100

    -99
    1
    0
    100

    -99
    1
    0
    100

    -99
    1
    0
    100

    -99
    1
    0
    100

                    -99
-99
-99
DW_68567
              1
                                                            PLS_TZn
             1
DW_6859 7
                                                             PLS_TZn
DW_68617
               1
                                                             PLS_TZn
sewer 7
              1
                                                    100
                                                             PLS_TZn
```



ATTACHMENTS FOR SECTION 3.4:

LONG-TERM PERFORMANCE





engineers | scientists | innovators

Proposed Condition Long-Term Hydrologic Modeling

Metro Orange Line Water Infiltration and Quality Project

1. INTRODUCTION

As part of the Safe Clean Water Program Feasibility Study for the Metro Orange Line Water Infiltration and Quality Project ("Project"), this attachment documents the methodology and modeling results that support the quantified water quality and water supply benefits presented in the main report.

Given the nature of the proposed distributed infiltration BMPs, the Safe Clean Water project module's built-in modeling component cannot be utilized. Instead, the modeling work was performed using Los Angeles County's Watershed Management System 2.0 (WMMS 2.0). Detailed model development methodology is presented below.

2. MODEL DEVELOPMENT

WMMS 2.0 is the latest watershed modeling system that developed by Los Angeles Flood Control District. It is released to the public in May 2020. WMMS 2.0 is a thorough upgrade to WMMS 1.0 that was released in August 2013. In comparison to the previous version, WMMS 2.0 is calibrated based on hydrology and water quality monitoring data collected up to 2018 and hence can more accurately simulate contaminant loading, runoff volume, and flow rate associated with various design storms and long-term simulation for all major watershed within Los Angeles County. WMMS 2.0 contains two major components: a Loading Simulation Program in C++ (LSPC), which is a watershed modelling system to simulate runoff and pollutant loading; and a System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN), which utilizes LSPC model output and evaluates BMP performance in terms of pollutant load reduction and runoff volume reduction

The hydrology analysis included the development of a 10-year continuous simulation model between 10/1/2008 and 9/30/2018 and a 24-Hour, 85th Percentile simulations. Although the September 2019 Feasibility Study Guidelines state that a minimum of 20-years should be used for the annual average calculations, LA County staff have since requested that the modeling period match that of the online module which is 10/1/2008 - 09/30/2018

For the WMMS 2.0 model, the baseline LSPC model was modified by editing the subwatershed boundary and hydrologic response unit (HRU) parameters to simulate dry and wet weather runoff from the Project drainage areas¹. The hydrologic response unit (HRU) within the revised subwatershed boundary was updated accordingly using the HRU raster downloaded from WMMS 2.0 website. A SUSTAIN model² was then developed to determine the design-storm and average annual stormwater capture volumes for a range of BMP configurations. This section describes the inputs used, the proposed sizing scenario and the results. It is assumed that the

Proposed Condition Long-Term Hydrologic Modeling

¹ Model input was developed and executed using LSPC v6.0 provided in the WMMS 2.0 application package.

² Model input was developed and executed using SUSTAIN v2.1 provided in the WMM S 2.0 application package.

baseline LSPC model has been calibrated by LACFCD to reflect the hydrologic condition within each watershed in Los Angeles County. Default parameters were used unless site-specific modification was required (e.g. subwatershed boundary).

The remainder of the section focuses on describing the long-term simulation development of the WMMS 2.0 model.

3. ASSUMPTIONS AND APPROACH

The WMMS 2.0 input parameters assumed for each scenario included:

- **Precipitation and Model Run Time:** Taken directly from the baseline WMMS 2.0 database, the default rain gauges assigned to LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861 and model run time (10/1/2008 09/30/2018) were used for the simulation. to be consistent with the recommended modeling period specified in the SCW online module. The 10-year hyetographs for the selected rain gauges are shown in Figure 1.
- **Dry-weather Runoff Estimate:** The LSPC model simulation estimated the dry weather runoff as a function of irrigated pervious HRU. This was updated for the updated Project drainage area described above.
- **Soils:** Taken directly from the baseline WMMS model, the default WMMS soil parameters adopted from LSPC subwatersheds 6839, 6844, 6850, 6856, 6859 and 6861were used in the simulation.
- **Routing:** Stormwater and dry weather runoff routing as illustrated in Figure 2 was set up in the SUSTAIN model to evaluate the proposed BMP configuration and dimensions. Consistent with the drywell cluster drainage areas shown in Figure 3, a total of seven³ 10-year LSPC hydrographs were included in the SUSTAIN model. During the simulation, bypass from any BMP cluster is considered overall bypass is not routed to any downstream BMP.

³ One hydrograph per LSPC subwatershed listed above. In addition, two of the proposed infiltration BMPs receive runoff from each of two distinct sub-drainages within subwatershed 6844. To distinguish the hydrographs, one of the hydrographs was labeled as 6665.

4. **RESULTS**

This section summarizes the modeling output. All model input and output files are provided in Appendix A.

Key inputs and results from the WMMS model are summarized below in Table 1 for the 10-year long-term continuous simulation model. The results were aggregated from all the drainage area and organized in accordance with the input required specified in the SCW Project Module.

Table 1. Summary of WMMS Model Inputs and Results (10-Year Model Run)

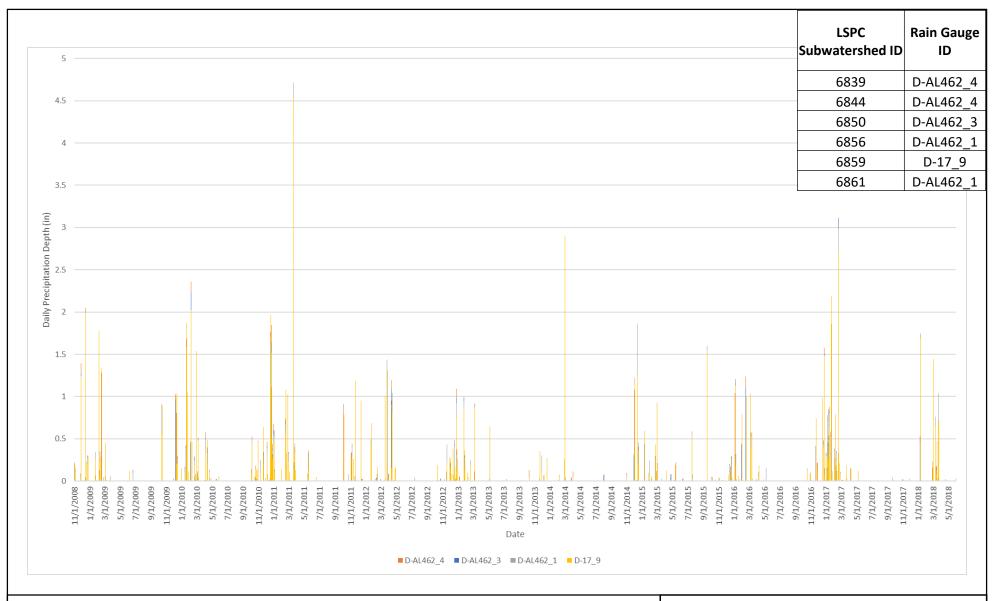
Key Modeling Input				
10-Year Rainfall Total (10/2008 – 9/2018) (inches)	1154			
Average Annual Rainfall (inches)	11.5			
Total Number of Drywells Modeled	168			
Infiltration Capacity per Drywell (cfs)	0.8			
Key Modeling Output				
Average Stormwater Inflow Rate (cfs)	98.4			
Average Dry Weather Inflow Rate (cfs)	0.1			
10-Year Total Stormwater Runoff Volume (ac-ft)	13,500			
Average Annual Stormwater Runoff Volume (ac-ft/year)	1,350			
10-Year Runoff Volume Captured (ac-ft)	8,900			
Average Annual Runoff Capture (ac-ft/year)	890			
Average Capture Percentage	65%			

Since the infiltration BMPs achieve pollutant reduction via runoff volume reduction, the average capture percentage is assumed equivalent to the pollutant removal efficiency of all modeled pollutants.

In summary, on an annual basis, based on the long-term simulation, the proposed Project is projected to capture and recharge 890 acre-feet of stormwater and dry weather runoff and achieve a 65% pollutant load reduction.

⁴ Average value of all rain gauges used in the model

FIGURES Proposed Condition Long-Term Hydrologic Modeling



10-Year Hyetograph

Metro Orange Line Water Infiltration and Quality Project –
Exiting Hydrology and Water Quality Condition
Los Angeles, CA

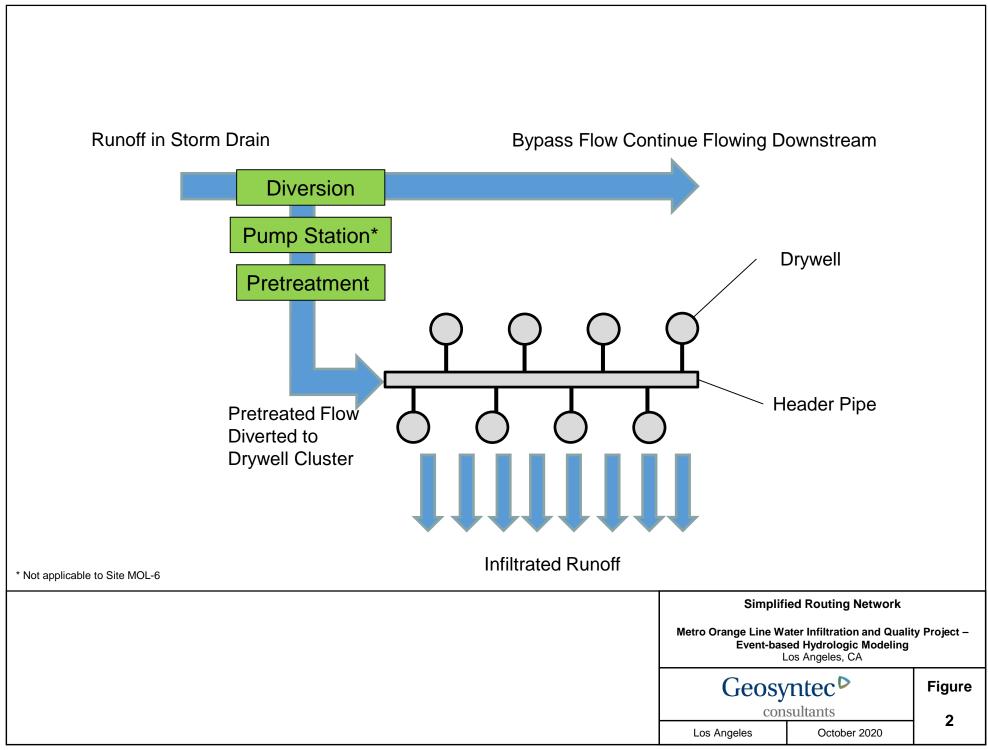
Geosyntec [▶]
1.

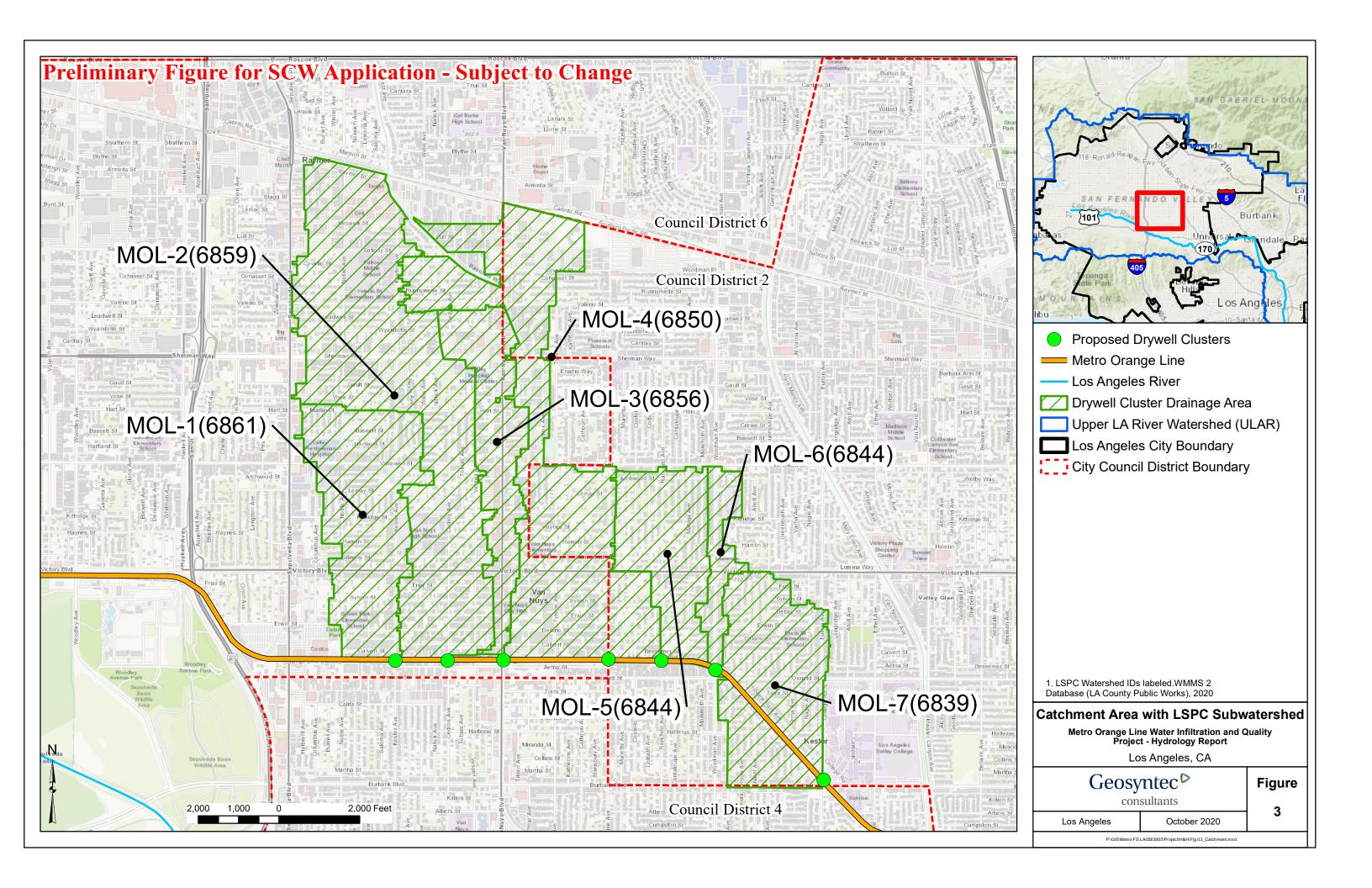
Figure

consultants

Los Angeles October 2020

1





APPENDIX A WMMS 2.0 LSPC and Sustain Model

*Output not included as it contains 10,000+ lines of times series output. Output can be provided as electronic copy upon request

LSPC Model Input

(Please see Appendix A of the Hydrology PDF uploaded to "Design Elements -> Site Condition & Constraints" section of this application

SUSTAIN Model Input

```
______
c SUSTAIN: System for Urban Stormwater Treatment and Analysis INtegration
c Version 2.1 - Jan 2020
c Created through code updates by:
c Paradigm Environmental, Inc.
c San Diego, California, USA
c www.paradigmh2o.com
c Based upon SUSTAIN version 1.2 (Apr 2014), originally developed by:
c United States Environmental Protection Agency
c Office of Research & Development
c with support by Tetra Tech, Inc.
c https://www.epa.gov/water-research/system-urban-stormwater-treatment-and-analysis-integration-sustain
c NOTE: The line starting with the letter c and followed by space or - is a comment line.
              There must be no comment line in between the data lines
C
              The input text field must be a continuous string without any space in between the characters
C
C-----
c700 Model Controls
c LINE1 = Land simulation control (0-external),
                  Land output directory path (containing unit-area land output timeseries)
                  Note: external land timeseries data must be in this order;
C
                            flow (in./timestep),
С
                             groundwater recharge (in./timestep),
C
                             pollutant 1 (lb/acre/timestep),
                            pollutant2, ...
c LINE2 = Start date of simulation (Year Month Day)
c LINE3 = End date of simulation (Year Month Day)
c LINE4 = Land Timeseries timestep (Minute),
                  BMP simulation timestep (Minute),
C
                  CRRAT = The ratio of max velocity to mean velocity under typical flow conditions (value of 1.0 or
greater),
                  Model output control (0-same timestep as land time series; 1-hourly),
C
C
                  Model output directory path
c LINE5 = PET Flag (0-constant monthly PET, 1-PET from the timeseries (in/timestep as land time series),
                 PET time series file path (required if PET flag is 1)
c LINE6 = Monthly PET rate (in/day) if PET flag is 0 OR
                  Monthly PET coefficient (multiplier to PET value) if PET flag is 1
C
C
0
             C:\SUSTAIN_X64\LA0583005\Timeseries\10-Year\SURO
2008
             1.0
                          1
2018
             9
                           30
60
                           1.5
                                                      C:\SUSTAIN_X64\LA0583005\Output\10-Year\SURO
Λ
0.0632 \quad 0.0798 \quad 0.1174 \quad 0.1507 \quad 0.1626 \quad 0.1787 \quad 0.1897 \quad 0.1855 \quad 0.1547 \quad 0.1047 \quad 0.0715 \quad 0.0531 \quad 0.0632 \quad 0.0798 \quad 0.0798 \quad 0.0715 \quad 0
C-----
c705 Pollutant Definition
c POLLUT_ID = Unique pollutant identifier (Sequence number same as in land output time series)
c POLLUT_NAME = Unique pollutant name
c MULTIPLIER = Multiplying factor used to convert the pollutant load to lbs (external control)
c SED_FLAG
                         = The sediment flag (0-not sediment,1-sand,2-silt,3-clay,4-total sediment)
                            if = 4 SEDIMENT will be splitted into sand, silt, and clay based on the fractions defined in card
710.
                       = The sediment-associated pollutant flag (0-no, 1-yes)
c SED OUAL
C
                            if = 1 then SEDIMENT is required in the pollutant list
c SAND_QFRAC = The sediment-associated qual-fraction on sand (0-1), only required if SED_QUAL = 1
c SILT_QFRAC = The sediment-associated qual-fraction on silt (0-1), only required if SED_QUAL = 1
c CLAY_QFRAC = The sediment-associated qual-fraction on clay (0-1), only required if SED_QUAL = 1
C
c POLLUT_ID
                        POLLUT_NAME
                                                   MULTIPLIER
                                                                            SED_FLAG
                                                                                                             SED_QUAL
                                                                                                                                       SAND_QFRAC
                                                                                                                                                                   SILT_QFRAC
             CLAY_QFRAC
```

```
1
      TSS
           2240 0
                                0
                                0
     TN 1 0 0
3
      ΤP
             1
                   Ω
                          Ω
                                 Ω
             1
                                0
                                      0
                  0
4
      TCD
                          0
                                              0
            1
      TCU
                  0
                                0
                                 0
                                       0
6
      TPB
             1
                   0
                          0
                                               0
                          0
                                 0
      TZN
                   0
                                        0
C-
c710 LAND USE DEFINITION (required if land simulation control is external)
c LANDTYPE
              = Unique land use definition identifier
= land use name c IMPERVIOUS = District
               = Distinguishes pervious/impervious land unit (0-pervious; 1-impervious)
c TIMESERIESFILE = File name containing input timeseries
           = The fraction of total sediment from the land which is sand (0-1)
c SAND_FRAC
c SILT_FRAC
              = The fraction of total sediment from the land which is silt (0-1)
             = The fraction of total sediment from the land which is clay (0-1)
c CLAY_FRAC
C
                          IMPERVIOUS
c LANDTYPE
            LANDNAME
                                        TIMESERIESFILE SAND FRAC
                                                                  SILT FRAC
                                                                                CLAY FRAC
    Road_Freeway-All-All-All 1
                                       1000_Road_Freeway-All-All-All.txt 0
                                                                                0.55 0.4
C-
_____
c712 Aquifer INFORMATION
c Initial Storage = Initial Storage (ac-ft)
c RecessionCoef = Recession Coefficient (1/hr)
              = Seepage Coefficient (1/hr)
c SeepageCoef
C
c AquiferID AquiferNAME
                        InitialStorage RecessionCoef SeepageCoef
C-----
c713 Aquifer Pollutant Background Concentration
c AquiferID = Unique Aquifer identifier as in c712
c Ci = Background concentration for pollutant i (mg/l)
C
            Where i = 1 to N (N = Number of QUAL from card 705)
C
c AQUIFER_ID QUALC1 QUALC2 ... QUALCN
c715 BMP SITE INFORMATION
c BMPSITE
         = Unique BMP site identifier
c BMPNAME = BMP template name or site name
c BMPTYPE = Unique BMP Types (must use the exact same keyword)
C
(BIORETENTION, WETPOND, CISTERN, DRYPOND, INFILTRATIONTRENCH, GREENROOF, POROUSPAVEMENT, RAINBARREL, REGULATOR, SWALE, CON
DUIT,BUFFERSTRIP,AREABMP)
c DArea
          = Total Drainage Area in acre
c NUMUNIT
          = Number of BMP structures
c DDAREA
          = Design drainage area of the BMP structure (acre)
c PreLUType = Predevelopment land use type (for external land simulation option)
c AquiferID = Unique Aquifer ID, 0 --- no aquifer (for external land simulation option)
c FtableFLG = Ftable flag, 0 = no, 1 = yes (for BMP Class A, B, and C)
c FTABLE_ID = Unique Ftable identifier (continuous string) as in card 714
C
c BMPSITE
             BMPNAME BMPTYPE DArea NUMUNIT DDAREA PreLUType
                                                           AquiferID
                                                                        FtableFLG
                                                                                      FTABLE_ID
out SubwatershedOutlet JUNCTION 0 1 0
                                                          1 0
                                                                        0 No
                                                     1
                                                          0
                                                                  0
      UntreatedFlow JUNCTION 0
                                                                        No
                                                                                Ω
TBDBMP BioretentionTypel BIORETENTION
                                       0
                                              1
                                                     0
                                                            1
                                                                  0
                                                                                No
                                              1
                                                                        0
                                                    1
                                                           0
                                                                                              0
DW_6665 BioretentionType1
                          INFILTRATIONTRENCH
                                                                  1
                                                                                Ω
                                                                                      Nο
DW_6671 BioretentionType1
                         INFILTRATIONTRENCH
                                                           0
                                                           0
DW_6673 BioretentionType1
                                                                   1
                                                                                      No
                          INFILTRATIONTRENCH
                                              1
                                                     1
                                                                         0
                                                                               0
                                                                                              Ω
DW_6674 BioretentionType1
                          INFILTRATIONTRENCH
                                                            0
                                                                         0
                                                                                       No
                                                                                      No
DW_6675 BioretentionType1
                          INFILTRATIONTRENCH
                                                     1
                                                           0
                                                                   1
                                                                         0
                                                                               0
                                              1
                                                    1
                                                           0
DW_6684 BioretentionType1
                          INFILTRATIONTRENCH
                                              1
                                                                  1
                                                                        0
                                                                               0
                                                                                              0
                                                                                     No
                                                                                      No
No
DW_6839 BioretentionType1
                          INFILTRATIONTRENCH
                                                           0
                                                                         0
                                                                                0
                                                                                              0
                                               1
                                                     1
                                                                   1
                                                    1
                                                                               0
                                                           0
                                                                        0
DW_6844 BioretentionType1
                          INFILTRATIONTRENCH
                                               1
                                                                   1
                                                                                              0
DW_6850 BioretentionType1
                          INFILTRATIONTRENCH
                                                           0
                                                                                     No
                                                          0
0
                                                                        0
0
                                                                              0
0
DW_6856 BioretentionType1
                                              1
                                                    1
                                                                 1
                                                                                     No
                                                                                              Ω
                          INFILTRATIONTRENCH
DW_6859 BioretentionType1
                          INFILTRATIONTRENCH
                                               1
                                                     1
                                                                   1
                                                                                       No
                                                                                              0
                                                                        0
DW_6861 BioretentionType1 INFILTRATIONTRENCH sewer Sewer JUNCTION 0 1 0
                                                           0
                                                                   1
                                                     1
                          INFILTRATIONTRENCH
                                              1
                                                                                0
                                                                                              0
                                                                                       No
                                                          0
                                                                 0
                                              1
                                                    0
                                                                        0
```

c720 Point Source Definition

```
c point source timeseries data must be in this order; flow (in.-acre/timestep), pollutant 1 (lbs/timestep),
pollutant2, ...
c POINTSOURCE
             = Unique point source identifier
c DESCRIPTION = point source description (a continuous string without any space)
c BMPSITE = BMP site identifier in card 715
c MULTIPLIER = Multiplier applied to the timeseries file (flow and pollutants). It will be in addition to
the pollutant multiplier in card 705
c TIMESERIESFILE = File name containing input timeseries
            = The fraction of total sediment which is sand (0-1)
c SAND FRAC
             = The fraction of total sediment which is silt (0-1)
c CLAY_FRAC = The fraction of total sediment which is clay (0-1)
c POINTSOURCE BMPSITE MULTIPLIER
                                 TIMESERIESFILE SAND_FRAC
                                                           SILT FRAC
                                                                        CLAY FRAC
   Inflow_1 DW_66651 6665.out 0 0
                                6671.out
6673.out
                   DW_6671 1
2
      Inflow_2
                                            0
                  DW_6673 1
                                                    0
     Inflow_3
3
                                                           0
                  DW_6674 1
     Inflow_4
                                6674.out
     Inflow_5
                                                    0
5
                  DW_6675 1
                                6675.out
                                            0
                   DW_6684 1
6
      Inflow 6
                                 6684.out
                                              0
                                                     0
                 DW_6839 1
DW_6844 1
                                                    0
     Inflow_7
                                             0
                                6839.out
7
8
     Inflow_8
                                6844.out
                                             0
                                                   0
     Inflow_9
Inflow_10
                  6850.out
6856.out
                                              0
                                                    0
0
9
                                                           0
10
                                                           Ω
     Inflow_10 DW_6850 1
Inflow_11 DW_6859 1
Inflow_12 DW_6861 1
                                6859.out
11
                                              0
                                                   0
12
                                6861.out
                                                          0
C-----
c721 Tier-1 Watershed Outlets Definition
            = BMP site (watershed outlet) identifier in card 715
c BMPSITE
c NUMBREAKS = Number of break points on the cost-effectiveness curve
c CECurveFile = CECurve_Solutions file for the project cost (sorted cost value) of each break point
C
            NUMBREAKS
c BMPSITE
                         CECurveFile
C-----
c722 Tier-1 Watershed Timeseries Definition
              = BMP site (watershed outlet) identifier in card 721
c BREAKPOINTID = Unique break point id on cost-effectiveness curve
                (0 for initial, -1 for PreDev, and -2 for PostDev condition)
            = Multiplier applied to the timeseries file
c MULTIPLIER
c TIMESERIESFILE = Timeseries output file corresponding to the breakpoint id
C
c BMPSITE
           BREAKPOINTID MULTIPLIER TIMESERIESFILE
c-
c723 Pump Curve (applies if PUMP_FLG is ON in card 725)
c PUMP_CURVE = The unique name of pump curve (continuous string without space)
c NUM_RECORD = Number of points on the curve
c DEPTH
         = Depth (ft)
c FLOW
         = Pumping flow rate (cfs)
C
c PUMP_CURVE NUM_RECORD
c DEPTH FLOW
Qinf_6665
0 8
50
      8
Qinf_6671
0 4.8
50
      4.8
Qinf_6673
   7.2
0
50
Qinf_6674
    4.8
0
50
      4.8
Qinf_6675
0 2.4
50
      2.4
Qinf_6684
0
     0.8
50
      0.8
Qinf_6839
    22.4
0
50
      22.4
```

```
Qinf_6844
0 10.4
50
      10.4
Qinf_6850
      31.2
50
      31.2
Qinf_6856
0 11.2
50
      11.2
Qinf_6859
0 32
50 32
Qinf_6861
   19.2
Ω
      19.2
50
C------
c725 CLASS-A BMP Site Parameters (required if BMPSITE is CLASS-A in card 715)
c BMPSITE = Class A BMP dimension group identifier in card 715
c WIDTH = Basin bottom width (ft)
c LENGTH = Basin bottom length (ft) / diameter (ft) for rain barrel or cistern
c OHEIGHT = Orifice Height (ft)
c DIAM = Orifice Diameter (in)
c CCOEF = Contraction Coefficient, user-specified value between 0 and 1 (e.g., Rounded = 1.0, Short Tube =
0.8, Sharp-edged = 0.61, Borda = 0.5)
c RELTP = Release Type (1-Cistern, 2-Rain barrel, 3-others)
c PEOPLE = Number of persons (Cistern Option)
c DDAYS = Number of dry days (Rain Barrel Option)
c WEIRTP = Weir Type (1-Rectangular,2-Triangular)
       = Weir Height (ft)
= (weir type 1) Weir width (ft)
c WEIRH
c WEIRW
c THETA = (weir type 2) Weir angle (degrees)
c ET_MULT = multiplier to PET
c PUMP_FLG = pump option (0-OFF, 1-ON)
c DEPTH_ON = water Depth (ft) at which the pump is started
c DEPTH_OFF = water Depth (ft) at which the pump is stopped
c PUMP_CURVE = The unique name of pump curve (continuous string without space)
c BYPASS_FRAC = Fraction of inflow that bypasses the BMP when full (0.0-1.0)
c DIV_RATE = Maximum flow diversion rate into BMP (cfs)
C
                                    EXITYPE RELEASETYPE PEOPLE DDAYS WEIRTYPE WEIRH WEIRW THETA
c BMPSITE WIDTH LENGTH OHEIGHT DIAM
ET_MULT PUMP_FLG DEPTH_ON DEPTH_OFF PUMP_CURVE BYPASS_FRAC DIV_RATE
                          0
TBDBMP 0 0
                   0
                                0.61
                                             0
                                                    0
                                                          1
                                                                        10000
                                                                                           0
     0
            0
                   none 0
0 0.1
                                -1
           7.16
         1 29
DW_6665 10
                                0.61
                                       3
                                             0
                                                    0
                                                          1
                                                                 45
                                                                       10000
                                                                             0
                                                                                     0
                                                                                           1
    5
                   Qinf_6665
                                0
                                       -1
DW_6671 10 4.29
                  0 0.1
                                0.61
                                       3
                                             Ω
                                                    Ω
                                                                 45
                                                                       10000
                                                                                     Λ
                                                          1
                                                                             Ω
                                                                                           1
                   Qinf_6671
      5
             1
                                0
                                       -1
DW_6673 10
                  0 0.1
                                             Ω
                                                    Ω
                                                                       10000
            6.44
                                0.61
                                       3
                                                          1
                                                                 45
                                                                             Ω
                                                                                     Ω
                                                                                           1
     5
           1
                   Qinf_6673
                                0
                                       -1
DW_6674 10
            4.29
                  0 0.1
                                0.61
                                             0
                                                    0
                                                          1
                                                                 45
                                                                       10000
                                                                             0
                                                                                     0
                                       3
                                                                                           1
   5
             1
                   Qinf_6674
                                0
                                       -1
                   0 0.1
DW_6675 10
            2.15
                                0.61
                                       3
                                             0
                                                    0
                                                          1
                                                                 45
                                                                       10000
                                                                             0
                                                                                     0
                                                                                           1
            1
     5
                   Qinf_6675
                                0
                                       -1
             0.72
DW_668410
                   0 0.1
                                0.61
                                       3
                                                    0
                                                          1
                                                                 45
                                                                       10000
                                                                             0
                                                                                     0
                                                                                           1
     5
             1
                   Oinf 6684
                                0
                                       -1
DW_6839 10
             20.04
                   0 0.1
                                0.61
                                             0
                                                    0
                                                          1
                                                                 45
                                                                       10000
                                                                             0
                                                                                     0
                   O - Qinf_6839
                                                                                           1
            1
                                0
                                       -1
    5
DW_6844 10
             9.30
                   0 0.1
                                0.61
                                       3
                                             0
                                                    0
                                                          1
                                                                 45
                                                                       10000
                                                                             0
                                                                                     0
                                                                                           1
                   Qinf_6844
   5
            1
                                0
                                       -1
DW_6850 10
            27.91
                                0.61
                                                    Ω
                                                                 45
                                                                       10000
                                                                                     Ω
                   0 0.1
                                       3
                                             Ω
                                                          1
                                                                             Ω
                                                                                           1
             1
                   Qinf_6850
                                0
                                       -1
DW_6856 10
             10.02
                                                                       10000
                   0 0.1
                                0.61
                                       3
                                             Ω
                                                    Ω
                                                          1
                                                                 45
                                                                             Ω
                                                                                     Ω
                                                                                           1
   5
             1
                   Qinf_6856
                                0
                                       -1
                   0 0.1
DW_6859 10
            28.62
                                0.61
                                       3
                                             0
                                                    0
                                                          1
                                                                 45
                                                                       10000
                                                                             0
                                                                                     0
                                                                                           1
  5
             1
                   Qinf_6859
                                0
                                       -1
DW_6861 10
             17.17
                   0 0.1
                                0.61
                                             0
                                                    0
                                                          1
                                                                 45
                                                                       10000 0
                                                                                           1
            1
                               0
     5
                   Qinf_6861
                                      -1
c730 Cistern Control Water Release Curve (applies if release type is cistern in card 725)
c BMPSITE = Class A BMP dimension group identifier in card 715
c Flow = Hourly water release per capita from the Cistern Control (ft3/hr/capita)
c BMPSITE
             FLOW
                                                                       0
TBDBMP 0
             0
                   0
                          0
                                0
                                       0
                                             0
                                                   0
                                                          0
                                                                 0
                                                                            0
                                                                                   0
                                                                                           0
```

```
0 0
DW_6671 0
                    Ω
                          0
                                 Ω
                                       Ω
                                               Ω
                                                     Ω
                                                             0
                                                                                               0
             0
                                 0
                                       0
                  0
                                                     0
  0
                          Ω
                                              Ω
                                                            Ω
                                                                   Ω
DW_6673 0
                                0
                                              0
                                                                                               0
             0
                  0
                         0
                                       0
                                             0
                                                    0
                                                           0
     0
                                0
                                                                   0
DW_6674 0
                   0
                                 0
                                                                          0
                                                                                 0
                                                                                        0
             0
                          0
                                        0
                                               0
                                                     0
                                                            0
                                                                   0
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            0
                   0
                         0
                                                    0
                                0
                                       0
     0
                                              0
                                                            0
                                                                   0
                                0
                                                    0
            0
                         0
                                       0
                                                           0
DW_6675 0
                  0
                                              0
                                                                   0
                                                                          0
                                                                                 0
                                                                                        0
                                                                                               0
                         0
      0
             0
                   0
                                 0
                                       0
                                               0
                                                     0
                                                            0
                                                                   0
            0
                                 0
                                       0
                                                    0
                   0
                                                            0
DW_6684 0
                                               0
                                                                   0
                                                                          Ω
                                                                                 Λ
                                                                                        Ω
                                                                                               0
                         0
      0
                  0
                                                           0
                  0
                         0
                                       0
                                              0
                                                    0
                                                                  0
DW_6839 0
            0
                                0
                                                           0
                                                                          Ω
                                                                                 Ω
                                                                                        0
                                                                                               0
                   0
                          0
                                 0
                                        0
                                                            0
                                                                   0
      Ω
             0
                                               0
            0
                   0
                                                    0
                         0
                                0
                                       0
DW_6844 0
                                                           0
                                                                                 0
                                              0
                                                                  0
                                                                                        0
                                                                                               0
            0
                                              0
                                                    0
                                                           0
                                                                  0
                                0
                                       0
                                0
                                       0
0
DW_6850 0
                                               Ω
                                                     Ω
                                                            Ω
                                                                                 Ω
                                                                                               0
   0
                                              0
                                                           0
                                                    0
                                                                   Ω
            0
                                0
                                      0
DW_6856 0
                                             0
                                                    0
                                                           0
                                                                                 0
                                                                                               0
                                      0 0 0
0 0 0
0 0 0
    0
                                0
0
0
                                                          0
0
0
                                                                  0
DW_6859 0
                                                                          0
                                                                                 0
                                                                                        0
                                                                                               0
                                                                   0
                                                                  0
  0
DW_6861 0
            0
                                0 0 0
0 0 0
                        0
                                                    0 0 0
                                                                         0
                  0
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                                                                                 0
                                                                                        0
                                                                                               0
   0
            0
                   0
                                                                  0
c735 CLASS B BMP Site DIMENSION GROUPS
c BMPSITE = BMP Site identifier in card 715
c WIDTH = basin bottom width (ft)
         = basin bottom Length (ft)
C LENGTH
c MAXDEPTH = Maximum depth of channel (ft)
c SLOPE1 = Side slope 1 (ft/ft)
c SLOPE2 = Side slope 2 (ft/ft) (1-4)
c SLOPE3 = Side slope 3 (ft/ft)
c MANN_N = Manning 's roughness coefficient
c ET_MULT = multiplier to PET
C
C BMPSITE WIDTH LENGTH MAXDEPTH SLOPE1 SLOPE2 SLOPE3 MANN_N ET_MULT
C-----
c740 BMP Site BOTTOM SOIL/VEGITATION CHARACTERISTICS
C
c BMPSITE = BMPSITE identifier in c715
c INFILTM = Infiltration Method (0-Green Ampt, 1-Horton, 2-Holtan)
c POLROTM = Pollutant Routing Method (1-Completely mixed, >1-number of CSTRs in series)
c POLREMM = Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method, 2-user defined
concentration)
c SDEPTH = Soil Depth (ft)
c POROSITY = Soil Porosity (0-1)
c FCAPACITY = Soil Field Capacity (ft/ft)
c WPOINT = Soil Wilting Point (ft/ft)
c AVEG
          = Vegetative Parameter A (0.1-1.0) (Empirical), only required for Holtan infiltration method
c FINFILT = Soil layer infiltration rate (in/hr)
c UNDSWITCH = Underdrain option (0-No underdrain, 1-underdrain with percent removal rate, 2-underdrain with
constant effluent conc.)
c UNDDEPTH = Depth of storage media below underdrain (ft)
c UNDVOID = Fraction of underdrain storage depth that is void space (0-1)
c UNDINFILT = Background infiltration rate, below underdrain (in/hr)
c SUCTION = Average value of soil capillary suction along the wetting front, value must be greater than zero
(in), only required for Green-Ampt infiltration method
c IMDMAX = Difference between soil porosity and initial moisture content, value must be greater than or
equal to zero (a fraction), only required for Green-Ampt infiltration method
c MAXINFILT = Maximum rate on the Horton infiltration curve (in/hr), only required for Horton infiltration
c DECAYCONS = Decay constant for the Horton infiltration curve (1/hr), only required for Horton infiltration
c DRYTIME = Time for a fully staurated soil to completely dry (day), only required for Horton infiltration
c MAXVOLUME = Maximum infiltration volume possible (in), only required for Horton infiltration method
c BMPSITE INFILTM POLROTM POLREMM SDEPTH POROSITY
                                                 FCAPACITY
                                                             WPOINT AVEG FINFILT UNDSWITCH UNDDEPTH
UNDVOID UNDINFILT SUCTION IMDMAX MAXINFILT DECAYCONS DRYTIME MAXVOLUME
TBDBMP 2 1 0 2 0.35 0.3 0.15 0 3 4 7
                                                                                0.4
                                                     0.6
                                                           1
                                                                          1.5
                                                                                        1
                                                                                               0
           1 0 0 0 0.4
3 4 7 0
1 0 0 0 0.4
3 4 7 0
DW_6665 2
                                0.4 0.3 0.15 0
                                                           0
                                                                  0
                                                                         1
                                                                               0.4 0.75
                                                                                              0
                                0
0.4 0.3 0.15 0
     0
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0.4 0.75

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DW_6665 0

DW_6671 2

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DW_6673 2
                                                0.4
                                                           0.3 0.15 0
                                                                                         0
                                                                                                             1
                                                                                                                      0.4 0.75
                                                                                                                                             0
                                        7
                                                  Ω
                                                  0.4
                                                                   0.15 0
                                                                                         0
DW_6674 2
                                                                                                                                  0.75
                                                 0
                                       7
  0
                                                 0.4 0.3 0.15 0
                                                                                           0
                                                                                                               1
                                                                                                                       0.4 0.75
                  3 4
1 0
3 4
1 0
3 4
1 0
                                      7
                                                 0
       0
DW_6684 2
                                       0
                                                  0.4
                                                                   0.15
                                                                                 0
                                                                                           0
                                                                                                     0
                                                                                                               1
                                                                                                                                   0.75
                                                                                                                                             0
                                     7
                                                 0
    0
                                      0
DW_6839 2
                                                0.4 0.3 0.15
                                                                              0
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0.4 0.3 0.15
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DW_6844 2
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                                                                                                                                   0.75
                                                                                                                                             0
                  0
                                                0.4 0.3 0.15
DW_6850 2
                                                                              0
                                                                                         0
                                                                                                     Ω
                                                                                                             1
                                                                                                                        0.4
                                                                                                                                  0.75
                                                                                                                                             Ω
                                                  0
DW_6856 2
                                                 0.4 0.3 0.15 0
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                                                                                                              1
                                                                                                                                   0.75
                                                                                                                                             0
0
DW_6859 2
0
                                                0
                                                0.4 0.3 0.15 0
0
                                                                                          0
                                                                                                               1 0.4
                                                                                                     Ω
                                                                                                                                  0.75
                   1 0 0 0.4
3 4 7 0
                                                0.4 0.3 0.15 0
 DW_6861 2
                                                                                                             1 0.4 0.75
     0
c745 BMP Site HOLTAN GROWTH INDEX
C
c HOLTAN EQUATION: F = GI * AVEG * (Computed Available Soil Storage)^ 1.4 + FINFILT
c BMPSITE = BMPSITE identifier in card 715
c GIi = 12 monthly values for GI in HOLTAN equation
              Where i = jan, feb, mar...dec
c BMPSITE jan feb mar apr may jun jul aug sep oct nov dec
0 0 0

        DW_6665 0
        0
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                                                                                                                         0
                                                                                                                         0
                                                                                                 0 0 0 0 0 0
                                                                                                                         0
                                                                                                                         0
                                                                                                                        0
c747 BMP Site Initial Moisture Content
c BMPSITE = BMP Site identifier in card 715
c WATDEP_i = initial surface water depth (ft)
c THETA_i = initial soil moisture (ft/ft)
c BMPSITE WATDEP_i THETA_i TBDBMP 0 0.15
                 0.15
DW_6665 0
DW_6671 0
                    0.15
                   0.15
DW_6673 0
DW_6674 0
                  0.15
                 0.15
0.15
DW_6675 0
DW_6684 0
                  0.15
DW_6839 0
                  0.15
DW_6844 0
DW_6850 0
                    0.15
                   0.15
DW_6856 0
DW_6859 0 0.15
DW_6861 0 0.15
c750 Class-C Conduit Parameters (required if BMPSITE is CLASS-C in card 715)
```

c750 Class-C Conduit Parameters (required if BMPSITE is CLASS-C in card 715 c
c BMPSITE = BMP site identifier in card 715
c INLET_NODE = BMP Id at the entrance of the conduit
c OUTLET_NODE = BMP Id at the exit of the conduit
c LENGTH = Conduit length (ft)
c MANNING_N = Manning's roughness coefficient
c INLET_IEL = Invert Elevation at the entrance of the conduit (ft)

c INLET_IEL = Invert Elevation at the entrance of the conduit (ft)
c OUTLET_IEL = Invert Elevation at the exit of the conduit (ft)

c INIT_FLOW = Initial flow in the conduit (cfs)

c ${\tt INLET_HL}$ = Head loss coefficient at the entrance of the conduit

```
c OUTLET_HL = Head loss coefficient at the exit of the conduit
c AVERAGE_HL = Head loss coefficient along the length of the conduit
C
                INLET_NODE OUTLET_NODE
                                                      LENGTH MANNING_N INLET_IEL OUTLET_IEL INIT_FLOW
       INLET_HL OUTLET_HL AVERAGE_HL
                                          ______
c755 Class C Conduit Cross Sections
c LINK
           = BMP site identifier in card 715
c TYPE
           = Conduit Type (rectangular, circular...)
c GEOM1 = Geometric cross-sectional property of the conduit
c GEOM2 = Geometric cross-sectional property of the conduit
           = Geometric cross-sectional property of the conduit
c GEOM3
c GEOM4 = Geometric cross-sectional property of the conduit
c BARRELS = Number of Barrels in the conduit
c LINK TYPE GEOM1 GEOM2 GEOM3 GEOM4 BARRELS
c-----
c760 Irregular Cross Sections
c Format of transect data follows:
c NC nLeft nRight nChannel c X1 name nSta xLeftBank
                                            xRightBank 0 0 0 xFactor yFactor
                         Station ...
c GR Elevation
C-----
c761 BufferStrip BMP Parameters (required if BMPTYPE is BUFFERSTRIP in card 715)
c BMPSITE = BMP site identifier in card 715
c Width
              = BMP width (ft)
c FLength = Flow length (ft)
c DStorage = Surface depression storage (in)
              = Overland slope (ft / ft)
c MANNING_N = Overland Manning's roughness coefficient
c POLREMM = Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method)
c ET_MULT = Multiplier to PET
c BMPSITE Width FLength DStorage SLOPE MANNING_N POLREMM ET_MULT
C-----
c762 Area BMP Parameters (required if BMPTYPE is AREABMP in card 715)
                 = BMP site identifier in card 715
c BMPSITE
                 = BMP area (ft2)
c FLength = flow length (ft) note: area width = area / flow length
c DStorage = Surface depression storage (in)
c SLOPE
                 = Overland slope (ft / ft)
c MANNING_N
                 = Overland Manning's roughness coefficient
c SAT_INFILT = Saturated infiltration rate (in/hr)
c POLREMM = Pollutant Removal Method (0-1st order decay, 1-kadlec and knight method) c DCIA = Percentage of Directly Connected Impervious Area (0-100)
c TOTAL_IMP_DA = Total Impervious Drainage Area (acre)
                 Area FLength DStorage
                                                     SLOPE MANNING_N
                                                                                SAT INFILT
                                                                                                   POLREMM DCIA TOTAL IMP DA
C------
c765 BMP SITE Pollutant Decay/Loss rates
c BMPSITE = BMP site identifier in card 715
c QUALDECAYi = First-order decay rate for pollutant i (hr^-1)
C
                 Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
C
                QUALDECAY1
                                    QUALDECAY2 ... QUALDECAYN
TBDBMP 0.008333333 0.008333333 0.008333333 0.008333333 DW_6665 0.008333333 0.008333333 0.008333333
                                                                               0.008333333
0.0083333333
                                                                                                 0.008333333 0.008333333
0.008333333 0.008333333
0.008333333
                                                                                                    0.008333333
                                                                                                                      0.008333333
                                                                                                    0.008333333
                                                                                 0.008333333
                                                                                                                      0.008333333
DW_6859 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.008333333 0.00833333 0.008333333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.00833333 0.0083333 0.0083333 0.0083333 0.0083333 0.0083333 0.0083333 0.0083333 0.0083333 0.008333 0.008333 0.008333 0.008333 0.00833 0.008333 0.008333 0.008333 0.008333 0.00
```

```
c766 Pollutant K' values (applies when pollutant removal method is kadlec and knight method in card 740)
c BMPSITE = BMP site identifier in card 715
C QUALK'i = Constant rate for pollutant i (ft/yr)
          Where i = 1 to N (N = Number of QUAL from card 705)
C
C
c BMPSITE
           QUALK'1 QUALK'2 ... QUALK'N
c767 Pollutant C* values (applies when pollutant removal method is kadlec and knight method in card 740)
c BMPSITE = BMP site identifier in card 715
c QUALC*i = Background concentration for pollutant i (mg/l)
         Where i = 1 to N (N = Number of QUAL from card 705)
C
c BMPSITE
           QUALC*1 QUALC*2 ... QUALC*N
c768 Pollutant C values (applies when surface release type is 4 in card 725)
c BMPSITE = BMP site identifier in card 715
c QUALCi = Constant surface release concentration for pollutant i (mg/l)
          Where i = 1 to N (N = Number of QUAL from card 705)
c BMPSITE
             QUALC1 QUALC2 ... QUALCN
TBDBMP 0
                   0
             0
DW_6665 0
            0
                   0
                          0
                                 0
                                       0
                                              0
                          0
DW_6671 0
            0
                  0
                                0
                                      0
                                              0
DW_6673 0
            0
                   0
                          Ο
                                 0
                                       0
DW_6674 0
             0
                   0
                          0
                                 0
                                       0
                                              0
DW_6675 0
            0
                   0
                         0
                                0
                         0
                                0
                                       0
                  0
DW_6684 0
            Ω
                                             0
                   0
                          0
                                 0
DW_6839 0
             0
                                       0
            0
                  0
                         0
                                       0
                                0
DW 6844 0
                                              0
                                      0
DW_6850 0
            0
                  0
                         0
                                0
            0
                   0
                          0
                                0
                                       0
                                              0
DW_6856 0
DW_6859 0
             Ω
                   Ω
                          Ω
                                 Ω
                                       Ω
                                               Ω
DW_6861 0
                         0
c770 BMP Underdrain Pollutant Percent Removal (applies when underdrain option is "1" in card 740)
c BMPSITE
            = BMPSITE identifier in card 715
c QUALPCTREMi = Perecent Removal for pollutant i through underdrain (0-1)
             Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
C
c BMPSITE
             QUALPCTREM1
                          QUALPCTREM2 ... QUALPCTREMN
                                     0
TBDBMP 0
            0 0
                          0 0
                                           0
DW_6665 0
                   Ω
                          0
                                 Ω
                                       0
           Ω
                  0
                                      0
DW_6671 0
            0
                          0
                                0
                                              0
DW_6673 0
             0
                   0
                          0
                                 0
                                       0
                                               0
DW 66740
                   0
                                       0
            0
                          0
                                0
                                              0
                  0
                         0
                                       0
DW_6675 0
             0
                                0
                  0
DW_6684 0
             0
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                                 0
                                       0
                         0
                                       0
DW 6839 0
            0
                                0
                  0
DW_6844 0
                         0
            0
                                0
                                      0
0
DW_6850 0
                   0
                         0
                                              0
DW_6856 0
             0
                   0
                          0
                                 0
                                               0
DW_6859 0
             0
                   0
                          0
                                 0
                                       0
                                               0
DW_6861 0
             0
                  0
                         0
                                0
                                       0
                                               0
c771 BMP Underdrain Pollutant Effluent Concentration (applies when underdrain option is "2" in card 740)
C
c BMPSITE
            = BMPSITE identifier in card 715
           = Underdrain effluent concentration for pollutant i (mg/l)
c OUALEFFCi
             Where i = 1 to N (N = Number of QUAL from TIMESERIES FILES)
C
            QUALEFFC1
                          QUALEFFC2 ... QUALEFFCN
c BMPSITE
TBDBMP 0
            0 0
                         0
                  0
DW_6665 0
            Ω
                                Ω
                                       0
                                               Ω
DW_6671 0
             0
                   0
                          0
                                0
                                       Ω
                                               0
                  0
            0
                                0
DW_6673 0
                         0
                                              0
            0
                  0
                         0
                                0
                                      0
DW_6674 0
                                               0
            0
                  0
0
                                       0
DW_6675 0
                          0
                                0
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                                0
                                      0
DW_6684 0
                          0
                                               0
DW_6839 0
                          0
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DW_6844 0
             Ω
                   0
                          0
                                  0
            0 0 0
                                 0
DW_6850 0
DW_6856 0
             Ω
                    Ω
                           Ω
                                  Ω
                                         0
DW_6859 0
             Ω
                    Ω
                            Ω
                                   Ω
                                                 Ω
DW_6861 0
             0
                                  0
c775 Sediment General Parameters (required if pollutant type is sediment in card 705)
c BMPSITE = BMP site identifier in card 715
c BEDWID = Bed width (ft) - this is constant for the entire simulation period
c BEDDEP = Initial bed depth (ft)
c BEDPOR = Bed sediment porosity
c BMPSITE
             BEDWID BEDDEP BEDPOR
c780 Sand Transport Parameters (required if pollutant type is sediment in card 705)
c BMPSITE = BMP site identifier in card 715
c D
c W
        = Effective diameter of the transported sand particles (in)
         = The corresponding fall velocity in still water (in/sec)
c RHO
        = The density of the sand particles (lb/ft3)
        = The coefficient in the sandload power function formula
c KSAND
c EXPSND = The exponent in the sandload power function formula
                          RHO
c BMPSITE
             D
                   W
                                KSAND EXPSND
c785 Silt Transport Parameters (required if pollutant type is sediment in card 705)
C
c BMPSITE = BMP site identifier in card 715
        = Effective diameter of the transported silt particles (in)
c D
c W
         = The corresponding fall velocity in still water (in/sec)
c RHO
         = The density of the silt particles (lb/ft3)
c TAUCD = The critical bed shear stress for deposition (lb/ft2)
c TAUCS = The critical bed shear stress for scour (lb/ft2)
        = The erodibility coefficient of the silt particles (lb/ft2/day)
c M
c BMPSITE
                   W
                          RHO
                                 TAUCD TAUCS M
C-----
c786 Clay Transport Parameters (required if pollutant type is sediment in card 705)
c D = Effective diameter of the transported clay particles (in)
c W = The corresponding fall volcation.
        = The density of the silt/clay particles (lb/ft3)
c RHO
c TAUCD
        = The critical bed shear stress for deposition (lb/ft2)
        = The critical bed shear stress for scour (lb/ft2)
c TAUCS
c M = The erodibility coefficient of the clay particles (lb/ft2/day)
C
c BMPSITE
            D
                   W
                         RHO
                                 TAUCD TAUCS M
c-----
c790 LAND TO BMP ROUTING NETWORK
c UniqueID = Identifies an instance of LANDTYPE in SCHEMATIC
c LANDTYPE = Corresponds to LANDTYPE in c710
c AREA = Area of LANDTYPE in ACRES
c DS = UNIQUE ID of DS BMP (0 - no BMP, add to end)
c LCGID = Land Control Group Identifier in card 711 (0 - no change)
C
c UniqueID
             LANDTYPE
                           AREA DS
                                         LCGID
c795 BMP Site ROUTING NETWORK
c BMPSITE
           = BMPSITE identifier in card 715
c OUTLET_TYPE = Outlet type (1-total, 2-weir, 3-orifice or channel, 4-underdrain, 5-untreated)
            = Downstrem BMP site identifier in card 715 (0 - no BMP, add to end)
c DS
C
c BMPSITE
            OUTLET_TYPE
                            DS
ut 1
             out
             0
out
TBDBMP 1
sewer 1
             out
DW_6665 2
              ut
DW_6671 2
             ut
```

```
DW_6673 2
              ut
DW_6674 2
DW_6675 2
              ut
DW_6684 2
              ut
DW_6839 2
              ut
DW_6844 2
              ut
DW_6850 2
              ut
DW 68562
              ut.
DW_6859 2
              ut
DW_6861 2
              ut
DW 66653
              sewer
DW_6665 4
              sewer
DW_6665 5
              out
DW_6671 3
              sewer
DW_6671 4
              sewer
DW_66715
              out
DW_6673 3
              sewer
DW_6673 4
              sewer
DW_66735
              out
DW_6674 3
              sewer
DW_6674 4
               sewer
DW_6674 5
              out.
DW_6675 3
              sewer
DW_6675 4
              sewer
DW_6675 5
              out
DW_66843
              sewer
DW_6684 4
              sewer
DW_66845
DW_6839 3
              sewer
DW_6839 4
              sewer
DW_68395
              out
DW_6844 3
               sewer
DW_6844 4
              sewer
DW_6844 5
              out
DW_6850 3
               sewer
DW_6850 4
              sewer
DW_68505
              out
DW_6856 3
              sewer
DW_6856 4
               sewer
DW_6856 5
              out
DW_6859 3
              sewer
DW_6859 4
               sewer
DW 68595
              out
DW_6861 3
              sewer
DW 68614
              sewer
DW_68615
c800 Optimization Controls
c Technique -- Optimization Techniques
     0 = no optimization
C
С
      2 = NSGAII
c Option -- Optimization options
     0 = no optimization
С
     1 = specific control target and minimize cost
С
     2 = generate cost effectiveness curve
c StopDelta -- Criteria for stopping the optimization iteration
              in dollars($), meaning if the cost not improved by this criteria, stop the search (for Option 1)
C
c MaxRuns -- Maximum number of iterations (should be greater than 4times the number of decision variables in
card 711 and 810)
c NumBest -- Number of best solutions for output (for Option 1)
C
c Technique
              Option StopDelta
                                     MaxRuns NumBest
            0 10000 1
0
  2
C-----
c805 BMP Cost Functions
c Cost ($) = ((LinearCost)*Length^(LengthExp) + (AreaCost)*Area^(AreaExp) +
(TotalVolumeCost)*TotalVolume^(TotalVolExp)
          + (MediaVolumeCost)*SoilMediaVolume^(MediaVolExp) +
(UnderDrainVolumeCost) *UnderDrainVolume^(UDVolExp)
       + (ConstantCost)) * (1+PercentCost/100)
C
c BMPSITE
                      = BMP site identifier in card 715
c LinearCost
                      = Cost per unit length of the BMP structure ($/ft)
c AreaCost
                      = Cost per unit area of the BMP structure ($/ft^2)
c TotalVolumeCost
                      = Cost per unit total volume of the BMP structure ($/ft^3)
                     = Cost per unit volume of the soil media ($/ft^3)
c MediaVolumeCost
```

```
c UnderDrainVolumeCost = Cost per unit volume of the under drain structure ($/ft^3)
c ConstantCost = Constant cost ($)
c PercentCost = Cost in percentage of all other cost ($)
c LengthExp = Exponent for linear unit
c AreaExp = Exponent for area unit
                = Exponent for total volume unit
= Exponent for soil media volume unit
c TotalVolExp
c MediaVolExp
                     = Exponent for underdrain volume unit
c UDVolExp
c BMPSITE LinearCost
                             AreaCost
                                            TotalVolumeCost
                                                                  MediaVolumeCost
                                                                                        UnderDrainVolumeCost
       ConstantCost PercentCost LengthExp AreaExp TotalVolExp MediaVolExp 0 0 0 0 0 0 1 1 1 1
                                                                                        UDVolExp
TBDBMP 0 0 0 0 0 DW_66665 0 0 12.6 0
1
                                                                        1
1
1
                                                                                        1
                                                                                         1
                                                                                 1
                                                                                1
                                                                                        1
                                                                        1
                                                                                         1
                                                                        1
1
                                                                                         1
                                                                                1
                                                                                         1
                                                                        1
                                                                       1
1
1
                                                                               1
                                                                                         1
                                                                                1
                                                                                         1
                                                                        1
                                                                                1
                                                                                         1
                                                                         1
                                                                                 1
C-----
c806 Diversion Structure Cost Function
c Cost ($) = ((DiversionCost)*DIV_RATE^(DiversionExp) + (ConstantCost)) * (1+PercentCost/100)
C
                   = BMP site identifier in card 715
= Cost per unit diversion rate ($/cfs)
= Exponent for diversion rate
c BMPSITE
c DiversionCost
c DiversionExp
                     = Constant cost ($)
c ConstantCost
                      = Cost in percentage of all other cost (%)
c PercentCost
c BMPSITE DiversionCost DiversionExp ConstantCost PercentCost TBDBMP 0 1 0 0
              1 0 0
DW_6665 25400 1
DW_6671 25400 1
                      Ω
                             0
                     0
                             Ω
DW_6673 25400 1
                    0
DW_6674 25400 1
                             0
DW_6675 25400
              1
                      0
                    0
DW 6684 25400 1
DW_6839 25400 1
                    0
DW_6844 25400 1
DW_6850 25400 1
                    0
                             0
DW_6856 25400 1
                    0
                     0
DW_6859 25400 1
                             0
DW_6861 25400 1
                    0
C-----
c810 BMP SITE Adjustable Parameters
c BMPSITE = BMP site identifier in card 715
c VARIABLE = Variable name (must use the exact same keyword)
             LENGTH --- BMP length,
C
             NUMUNIT --- number of units,
С
             WEIRH --- weir height,
            SDEPTH --- soil media depth,
C
            DCIA --- directly connected impervious area for area BMP type,
           MAXDEPTH --- maximum surface storage depth for swale,
C
           CECURVE --- cost-effectiveness curve for Tier-1 solution
C
            DIV_RATE --- maximum flow diversion rate into BMP
c FROM = From value in the range
         = To value in the range
c TO
c STEP
          = Increment step
c BMPSITE
              VARIABLE
                            FROM
                                     TO STEP
                            0
TBDBMP LENGTH 0 0
                             0.05
DW_6665 LENGTH 0
                      10
                    10
DW_6671 LENGTH 0
                             0.05
DW_6673 LENGTH 0
                    10
                            0.05
DW_6674 LENGTH 0
DW_6675 LENGTH 0
DW_6684 LENGTH 0
                          0.05
                    10
10
                             0.05
                    10
                            0.05
DW_6839 LENGTH 0
                    10
                            0.05
                    10
DW_6844 LENGTH 0
DW_6850 LENGTH 0
                             0.05
                      10
                             0.05
                    10
DW_6856 LENGTH 0
                          0.05
```

```
DW_6859 LENGTH 0
                    10
                             0.05
DW_6861 LENGTH 0
                     10
                             0.05
c814 Predeveloped Timeseries at Assessment Point for Flow Duration Curve
             = BMP site identifier in card 715 if it is an assessment point
c BMPSITE
          = Number of bins for flow duration curve
c NumBins
c PreDevFlag = Pre-developed timeseries option (1-internal,2-external)
c PreDevFile = Pre-developed timeseries file path for external option
              The timeseries file format (AssessmentPoint_ID
                                                                   Year
                                                                         Month Day Hour Minute
C
              The first line is skipped (comment line) and data start from the second line in the required
C
format.
C
c BMPSITE
             NumBins PreDevFlag
                                    PreDevFile
c815 Assessment Point and Evaluation Factor
c BMPSITE -- BMP site identifier in card 715 if it is an assessment point
{\tt c} FactorGroup -- Flow or pollutant related evaluation factor group
    -1 = flow related evaluation factor
     # = pollutant ID in card 705
C
c FactorType -- Evaluation Factor Type (negative number for flow related and positive number for pollutant
related)
C
    -1 = AAFV Annual Average Flow Volume (ft3/yr)
    -2 = PDF Peak Discharge Flow (cfs)
    -3 = FEF Flow Exceeding frequency (#times/year)
С
    -4 = FDC Flow Duration Curve (sum of sorted flow difference with pre-developed condition, cfs)
     1 = AAL Annual Average Load (lb/yr)
2 = AAC Annual Average Concentration (mg/L)
C
С
     3 = MAC Maximum #days Average Concentraion (mg/L)
C
c FactorVal1 -- if FactorType = 3 (MAC): Maximum #Days;
            -- if FactorType = -3 (FEF): Threshold (cfs)
C
             -- if FactorType = -4 (FDC): Low flow limit (cfs)
C
             -- all other FactorType : -99
c FactorVal2 -- if FactorType = -3 (FEF): Minimum inter-exceedance time (hr)
                                         if = 0 then daily running average flow exceeding frequency
                                         if = -1 then daily average flow exceeding frequency
C
                                         otherwise minimum inter-exceedance time for simulation interval
С
С
             -- if FactorType = -4 (FDC): High flow limit (cfs)
            -- all other FactorType : -99
C
c CalcMode -- Evaluation Factor Calculation Mode
    -99 for Option 0 (card 800): no optimizaiton
C
C
     1 = % percent of value under existing condition (0-100)
     2 = S scale between pre-develop and existing condition (0-1)
C
     3 = V absolute value in the unit as shown in FactorType (third block in this card)
c TargetVal1 -- Target value for evaluation factor calculation mode
     -99 for Option 0 (card 800): no optimizaiton
C
     Target value for minimize cost Option 1 (card 800)
     Lower limit of target value for cost-effective curve Option 2 (card 800)
C
c TargetVal2 -- Target value for evaluation factor calculation mode
     -99 for Option 0 (card 800): no optimizaiton
C
С
      -99 for Option 1 (card 800): minimize cost
     Upper limit of target value for cost-effective curve Option 2 (card 800)
C
c Factor_Name -- Evaluation factor name (user specified without any space), e.g. FlowVolume or SEDIMENT
c BMPSITE
              FactorGroup
                                                           FactorVal2
                             FactorType
                                            FactorVal1
                                                                         CalcMode
                                                                                        TargetVal1
                   FactorName
       TargetVal2
                             -99
            1
                      -99
                                     1
                                                           PLS_TZn
out
                                     1
                                           0
       7
ut
              1
                      -99
                             -99
                                                    100
                                                           PLS_TZn
TBDBMP 7
              1
                      -99
                             -99
                                     1
                                            0
                                                    100
                                                           PLS_TZn
                                    1
                                           0
DW_6665 7
                      -99
                             -99
              1
                                                   100
                                                           PLS_TZn
DW_6671 7
                     -99
                             -99 1
              1
                                           0
                                                   100
                             -99
                                           0
                      -99
                                   1
1
DW_66737
              1
                                                   100
                                                           PLS_TZn
DW_66747
                      -99
                             -99
                                            0
              1
                                                    100
                                                           PLS TZn
                                     1
                                           0
                                                   100
DW 66757
              1
                     -99
                             -99
                                                           PLS TZn
                                           0
                                  1
DW_66847
              1
                      -99
                             -99
                                                   100
                                                           PLS_TZn
                                    1
1
                                           0
DW_6839 7
              1
                      -99
                             -99
                                                    100
                                                           PLS_TZn
                     -99
                             -99
DW 68447
              1
                                                    100
                                                           PLS TZn
                    -99
                             -99 1
                                           0
DW_68507
              1
                                                   100
                                                          PLS_TZn

    -99
    1
    0
    100

    -99
    1
    0
    100

    -99
    1
    0
    100

    -99
    1
    0
    100

                   -99
-99
-99
DW_6856 7
              1
                                                          PLS_TZn
DW_68597
              1
                                                           PLS TZn
DW_6861 7
              1
                                                          PLS TZn
                             -99 1 0
sewer 7
             1
                    -99
                                                   100
                                                         PLS_TZn
```



ATTACHMENTS FOR SECTION 4.1:

NEXUS



Board of Commissioners
Cynthia McClain-Hill, President
Susana Reyes, Vice President
Jill Banks Barad
Nicole Neeman Brady
Susan A. Rodriguez, Secretary

Martin L. Adams, General Manager and Chief Engineer

October 15, 2020

Los Angeles County Metropolitan Transportation Authority Craig Reiter One Gateway Plaza Mail Stop 99-16-9 Los Angeles, California 90012-2952

Subject: Letter of Support for METRO Orange Line Water Infiltration and Water Quality Project

Los Angeles Department of Water and Power (LADWP) is pleased to express support for the METRO Orange Line (MOL) Water Infiltration and Water Quality Project (Project) for consideration to the Safe Clean Water Program (SCWP) Call for Projects Round two.

LADWP strongly supports multi-benefit opportunities and partnerships in projects that help achieve increases in stormwater capture, groundwater recharge, water quality, and community improvements. The Project will provide fast and reliable ridership to disadvantage communities, enhance pedestrian safety, provide significant water quality and water supply benefits, as well as support the transition to electric bus operations at the MOL. This Project will assist LADWP in achieving its long-term local supply strategies and sustainability, through augmenting local groundwater supply in the San Fernando Groundwater Basin and improving the water quality in the Los Angeles River downstream. In addition, this Project aligns with the critical needs and priorities established within the SCWP guidelines and further contributes to the development of disadvantaged communities.

LADWP intends to be a funding partner with METRO for the implementation of the Project, once it is successful in receiving SCWP Round two funding. LADWP intends to provide up to \$11,088,000 for the installation of 168 drywells (\$66,000 per drywell) pending LADWP Board of Commissioners' approval. Additionally, LADWP understands METRO will be responsible for operations and maintenance of the aforementioned drywells, through their viable Project life.

Mr. Craig Reiter Page 2 October 15, 2020

As a local advocate for stormwater capture projects that provide multiple benefits and long-term sustainability, LADWP strongly supports this Project and recommends that the SCWP award funding for the Project. LADWP appreciates your consideration.

If you have any questions about this letter of support, please contact Mr. Art Castro, Manager of Watershed Management, at (213) 367-2966.

Sincerely,

David R. Pettijohn

Director of Water Resources

AC:lb/cyr c: Art Castro

Delon Kwan





UPPER LOS ANGELES RIVER AREA WATERMASTER Richard C. Slade - Watermaster 14051 Burbank Blvd, Suite 300 Sherman Oaks, CA 91401

818-506-0418 PHONE 818-506-1343 FAX

December 4, 2020

Melissa Faigeles Levitt
Los Angeles County Metropolitan Transportation Authority
(Sent via email: LevittM@metro.net)

Job No. 500-LAS04

Re: Low Impact Development Improvements

Proposed Multi-Neighborhood Stormwater Infiltration Development Project

Metro Orange Line Busway Los Angeles, California

Dear Ms. Levitt:

Provided herein is a brief discussion of the information and reports that you have provided our office regarding your plans for the possible infiltration of stormwater that is to be collected and incorporated into the Low Impact Development (LID) improvements for the proposed multi-neighborhood stormwater infiltration development project, located in the City of Los Angeles (City), within portions of the Van Nuys and Valley Glen areas of the San Fernando Valley. We understand the project, which has a total area of ±2,000 acres, encompasses areas within the southern portions of both the Van Nuys and the Valley Glen neighborhoods. As such, this project overlies portions of the San Fernando Groundwater Basin, the largest of the four groundwater basins in the Superior Court-adjudicated Upper Los Angeles River Area (ULARA). Also provided herein, as ULARA Watermaster, is my opinion regarding the potential impact to local groundwater quality that might result from the proposed infiltration of stormwater that is to be captured by the Low Impact Development (LID) improvements that you have recommended for your project.

In regard to stormwater infiltration, the California Regional Water Quality Control Board – Los Angeles Region (LARWQCB) promulgated its National Pollutant Discharge Elimination System (NPDES) permit process in 1990 to help minimize the impacts of stormwater and urban runoff on the receiving water bodies in its sphere of influence (i.e., the Los Angeles River and the Pacific Ocean). The goal of their NPDES process was to minimize the impacts on the river, and ultimately to the ocean, by reducing the volume and improving the quality of surface water runoff from storm events. Because your proposed development is located within the ULARA



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watershed boundary, all local rainfall and surface water runoff from this site would normally drain into the Los Angeles River and eventually to the ocean.

Several years after the implementation of the NPDES process, the City of Los Angeles, Department of Public Works, Bureau of Sanitation – Watershed Protection Division (LAWPD), promulgated a series of guidelines intended to increase the capture and onsite infiltration of stormwater at all proposed developments and redevelopments throughout the City. These guidelines established the requirements and limitations for utilizing onsite stormwater infiltration and also specified an order of preference (via a set of Best Management Practices---BMPs) for providing LID improvements at each development and/or redevelopment site in the City.

The specific order of the BMP preference list was established by the LAWPD to collect and provide basic "treatment" of onsite stormwater runoff, and to help increase the amount of infiltration (i.e., deep percolation) from the initial 3/4-inch of rainfall from each storm event at all new development and redevelopment sites in the City. The end result is intended to reduce the volumes of contaminated stormwater runoff that enter the storm drain system (from each new storm event) and simultaneously help reduce the volume and enhance the quality of the runoff that enters the Los Angeles River and ultimately the Pacific Ocean. Turbidity and potential urban-derived contaminants in the captured runoff could be reduced by the "treatment" effects of the various stormwater infiltration systems proposed via the BMPs. From a hydrogeologic perspective, and in the opinion of this Watermaster, whenever and wherever (with certain exceptions) deep percolation (infiltration) of stormwater can be appropriately enhanced, then recharge to the underlying groundwater reservoir (in this case, the San Fernando Groundwater Basin) can be beneficially increased.

For this proposed project, you sent the following for Watermaster review:

- a. An email, received by the Watermaster's office on October 15, 2020, in response to the Watermaster's Data Request Memorandum. Your email and attachments provided responses to most of the items identified in the Watermaster's Memorandum. Note that a copy of that Data Request Memorandum is being routinely provided by LAWPD personnel to LID applicants upon their initial visit to the LAWPD office in downtown Los Angeles.
- b. A set of CAD-type drawings, prepared by the Los Angeles County Metropolitan Transportation Authority (LA Metro), which contained a project location map and a ULARA watershed plan, along with capture and recharge plans for dry well clusters



MOL-1 through MOL-7. The capture and recharge plans for MOL-1 through MOL-7 show the proposed locations of stormwater pretreatment facilities and 168 dry wells within the boundaries of the project. We understand that these proposed facilities are to be components of your stormwater infiltration system within the total $\pm 2,200$ acres of the project.

c. A soils report, Geotechnical Review: Metro Orange Line Water Infiltration and Quality Project, prepared by Geosyntec Consultants, Inc., and dated October 2020. The report described the earth materials encountered in the subsurface within/near the proposed project area in 23 soil borings that were drilled and sampled by others to depths in the range of approximately 35 feet below ground surface (bgs) to 193 feet bgs. It should be noted that groundwater was encountered during the drilling of some of these soil borings between the depths of approximately 77 ft bgs (April 2014) and 173 feet bgs (September 2006). Infiltration rates for the onsite earth materials were determined to a depth of approximately 50 feet bgs using hydraulic conductivity data collected from several cone penetration test (CPT) borings within/near the proposed project area.

Please note that no one from my office conducted a site visit to the subject LID property and that the information presented in this review was provided by the applicant and/or obtained from a cursory review of a few regulatory agency websites and basic sources of referenced information. Among the key items noted during our review of the available documents are the following:

- The proposed project encompasses an area within the southern portions of both the Van Nuys and the Valley Glen neighborhoods. A Google Earth Pro® satellite image dated August 19, 2019 shows that the proposed project is located in residential and commercial areas.
- A check of the online Geotracker database maintained by the California State Water Resources Control Board (SWRCB) shows that within 1,000 feet of the subject LID project, there are no "open" Department of Toxic Substances Control (DTSC) sites; or no "open" military cleanup sites.

However, there is an "open" cleanup site listed as "Systron Donner (Former)" that reportedly exists at 14837 Califa Street; this site is located approximately 800 feet southeast from the intersection of Kester Avenue and the Orange Line Busway. Thus, this "open" site is adjacent to the proposed dry well cluster location designated as MOL-1. Per the Geotracker website, the cleanup site is listed as "Open – Remediation as of 5/20/2019". According to the *Groundwater and Soil Vapor Extraction System Operation, Maintenance, and Monitoring Report: 3rd Quarter 2020*, dated October 15, 2020 and prepared by the site consultant, depth to groundwater ranged from approximately 174 feet to 176 feet bgs beneath this offsite property, and the local groundwater flow direction is toward the northeast. Volatile organic compounds (VOCs), specifically the contaminant known as trichloroethene (TCE), was detected in groundwater samples collected beneath this offsite property, at a maximum concentration of 1.5 micrograms



per liter (μ g/L). This value is below the SWRCB Primary Maximum Contaminant Level (MCL) for TCE (5 μ g/L) for drinking water.

There is an "open" leaking underground storage tank (LUST) site listed as "L.T. Sawyer, Inc." that reportedly exists at 14117 Aetna Street; this site is located at the southwestern corner of the intersection of Hazeltine Avenue and Aetna Street. Thus, this "open" LUST site is adjacent to the proposed dry well cluster location designated as MOL-4. According to the Geotracker website, this LUST site is listed as "Open – Remediation as of 2/2/2011". According to the *Groundwater Monitoring and Status Report: Second Quarter 2020*, dated July 9, 2020 and prepared by the site consultant, depth to groundwater ranged from approximately 169 feet to 176 feet bgs beneath this offsite property; the local groundwater flow direction is toward the southeast. VOCs, specifically the contaminants benzene, methyl tertiary butyl ether (MTBE), tetrachloroethene (PCE), and TCE, were detected in groundwater samples collected beneath this offsite property. Maximum concentrations of 9.5 μ g/L for benzene, 2,975 μ g/L for MTBE, 460 μ g/L for PCE, and 990 μ g/L for TCE were detected in groundwater samples collected beneath this site. These values are above the SWRCB MCL for benzene (1 μ g/L), MTBE (13 μ g/L), PCE (5 μ g/L), and TCE (5 μ g/L) for drinking water.

In addition, the proposed dry well cluster site near the intersection of Hazeltine Avenue and the Orange Line Busway, also a part of the MOL-4 designation, is located within an area of known groundwater contamination as shown on Draft figures (not included herein) prepared by the United States Environmental Protection Agency (EPA; 2019) for the eastern portion of the San Fernando Groundwater Basin. Those Draft maps illustrate the approximate areal extents and concentrations of various contaminant plumes in the local groundwater known to be present (through 2019) from certain VOCs, such as: PCE; 1,2,3-trichloropropane (TCP); TCE; and 1,4-dioxane. Other contaminate plume maps are for nitrate, total chromium (Cr), and hexavalent chromium (CrVI). Specifically, the proposed MOL-4 location is within an area where the nearest contour lines for PCE and TCE suggest that these contaminants are present at concentrations ranging from 5 to 49 μ g/L for PCE and TCE, respectively, in the groundwater beneath this proposed dry well location. These values are at or above the MCL for PCE (5 μ g/L) and TCE (5 μ g/L) for drinking water purposes.

Based on email communications with LA Metro, the Watermaster agrees with the proposal to relocate the proposed MOL-4 location approximately 500 feet to the west of the "open" LUST site and the EPA-defined plumes. This will allow the infiltration of stormwater at the relocated MOL-4 dry well cluster location to be outside of both the VOC-impacted groundwater associated with the LUST site and the EPA-defined plumes (2019).

3. As shown in the CAD-type drawings provided by LA Metro, stormwater will be collected from rainfall that flows as sheet flow across non-permeable paved areas within the proposed project area. The collected stormwater is to be directed to one of the 168 proposed dry wells (i.e., the infiltration systems). Each dry well is proposed to be constructed to a depth of approximately 45 feet bgs. Stormwater directed to the infiltration systems would reportedly be able to infiltrate into the subsurface (i.e., made

Low Impact Development Improvements
Proposed Multi-Neighborhood Stormwater Infiltration Development Project
Metro Orange Line Busway
Los Angeles, CA

O LII ARA

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available for deep percolation). The proposed infiltration systems are to be constructed within seven dry well cluster locations throughout the proposed project area.

It should be noted that the purpose of this LID stormwater infiltration review letter from the Watermaster's office is not in any way to evaluate and/or opine on the technical feasibility of the infiltration of stormwater at the site, but rather only to assess the concept of infiltration (and recharge) at the site strictly in regard to its potential impact on local groundwater quality. Thus, the Watermaster has no opinion regarding the potential for, or the technical feasibility of, the collected stormwater to be infiltrated into the earth materials beneath the subject property.

Further, your eventual LID permit from the LAWPD will require the property owner(s) [and all successors] to provide for ongoing operation and maintenance in perpetuity for all of the onsite LID facilities. The Watermaster considers this issue of ongoing maintenance of your proposed LID facilities to be critical to the long-term protection of the groundwater quality in the San Fernando Basin.

Based on our review of your documents, and assuming that the final stormwater collection system and infiltration systems are constructed as proposed and properly maintained in the future, and further assuming the specific dry well sites are moved out of the local contaminant plumes as discussed herein, then the Watermaster has no objection to the infiltration component of your current LID, in relation to the local groundwater quality. If the project and/or your LID and/or your infiltration system is revised in the future and differs from that which has been generally characterized herein, the Watermaster would then need to review those revised plans.

Respectfully submitted,

Richard C. Slade ULARA Watermaster



ATTACHMENTS FOR SECTION 4.2:

BENEFIT MAGNITUDE



ATTACHMENTS FOR SECTION 4.3:

COST EFFECTIVENESS





engineers | scientists | innovators

Cost Estimate and Cost Effectiveness Calculation

Metro Orange Line Water Infiltration and Quality Project

1. INTRODUCTION

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement infiltration best management practices (BMPs) within Los Angeles County Metropolitan Transportation Authority (LA Metro) parcels and right-of-way (ROW) in the San Fernando Valley area of the City of Los Angeles. The purpose of the Project is to capture and infiltrate stormwater runoff helping to recharge the groundwater basin, to improve downstream water quality, and to mitigate localized nuisance flooding in disadvantaged communities and other neighborhoods with significant unmet needs. Drywells and associated pretreatment facilities are the primary type of infiltration BMPs proposed for this Project. The proposed Project will be integrated into the MOL BRT Improvement Project to streamline the implementation process and to save cost during project construction.

To support the Project's Safe Clean Water Program application, this attachment documents the calculation of the capital and annual Project costs and presents an alternative method on determining the Project's cost effectiveness.

2. CAPITAL COSTS

Project capital costs include those for planning, design, and construction of 168 drywells, seven pretreatment facilities, six pump stations, six diversion structures and other miscellaneous structures (Table 1). Post-construction monitoring is only planned for Years 3 through 5 and they are included with the construction costs. Detailed cost breakdown can be found in Appendix A.

Table 1: Capital Cost Estimate

Phase	Description	Cost
Planning	Planning includes early concept design, site investigations, and CEQA and other environmental impact studies and permitting	\$241,000
Design	Design includes pre-project monitoring, site investigations, formal project design, and intermediate and final project completion audits.	\$2,153,000
Construction	Construction cost includes the cost of labor, equipment, material, plus overhead and contingencies ¹ . In addition, it includes the present value of 2-years post-construction monitoring ² .	\$27,829,000
	Total Capital Cost	\$30,223,000

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 $^{^{1}}$ Typically, overhead and contingencies can account for potential complications during the permitting, staging , site access stage

² Please see the Monitoring Plan for planned monitoring activities.

3. ANNUAL COSTS

Annual costs are estimated for years 3 through 33, based on a 30-year Project life cycle. Annual costs include inspection/maintenance and operation of the stormwater BMPs (Table 2). Detailed breakdown of the project cost can be found in the O&M Plan uploaded under the "Operation and Maintenance" section of this application.

Table 2: Annual Project Cost

Annual Cost									
Item	Cost								
Inspection and Maintenance	Cost includes material, labor, equipment and waste disposal associated with inspecting, repairing drywells, pretreatment facilities, and pump stations	\$741,000							
Operation	Cost includes labor and energy cost associated with operating pump stations, and labor cost associated with inspecting drywells and pretreatment facilities	\$82,000							
	\$823,000								

4. COST-SHARE SUMMARY

Committed cost-share is summarized in Table 3. Additional supporting documentation has been uploaded to the "Cost & Schedule \rightarrow Cost-Share" section in this application.

Table 3: Cost-Share Summary

Funding Type	Description	Funding Amount	Cost-Share as % of Capital Cost
Agreement	Cost-share provided by LADWP to fund the Project	\$11,088,000	37%

5. TOTAL AND ANNUALIZED LIFE-CYCLE COSTS

Total and annualized life-cycle costs³ before and after factoring the committed cost-share are calculated using formulas used in the SCW Online Project Module (Table 4). A 3.375% annual discount rate is used to maintain consistency with the SCW Online Project Module.

³ Determined based on 3-year of construction and 30-year of operation.

Table 4: Total and Annual Life-Cycle Costs Summary

Total Capital Cost	\$30,223,000
Project Cost Minus Committed Cost-Share	\$19,135,000
Present Value of 30-Year O&M Cost	\$15,193,000
Total Life Cycle Cost	\$45,599,521
Annualized Life Cycle Cost	\$2,430,808
Total Life Cycle Cost (Exclude Committed Cost-Share)	\$36,905,521
Annualized Life Cycle Cost (Exclude Committed Cost-Share)	\$1,975,300

6. COST EFFECTIVENESS

As presented in the "Water Supply -> Benefit Module" section in this application, the Project can capture and recharge 890 acre-feet of dry and stormwater runoff into the San Fernando Valley Groundwater Basin on an annual basis. In lieu of the Safe Clean Water Project Module's built-in formula, we propose computing the cost effectiveness based on the life cycle cost minus the committed cost-share:

$$Cost\ Effectivness = \frac{\text{Annualized\ Life\ Cycle\ Cost\ (Exclude\ Committed\ Cost\ Share)}}{Annual\ Water\ Supply\ Benefit} = \frac{\$1,975,300/year}{890\ ac-ft/year} = \$2,219\ per\ ac-ft$$

APPENDIX ACost Estimate Breakdown

Item	Description	Qty	Unit	U	nit Price	Total
1	Diversion Structure	1	LS	\$	52,000	\$ 52,000
2	20" PVC to Lift Station	110	LF	\$	400	\$ 44,000
3	Lift Station	1	LS	\$	222,000	\$ 222,000
4	20" PVC to Pretreatment	40	LF	\$	300	\$ 12,000
5	Pretreatment	1	LS	\$	74,000	\$ 74,000
6	20" PVC Distribution	460	LF	\$	300	\$ 138,000
7	20"x6" Double Y	12	EA	\$	6,000	\$ 72,000
8	6" PVC to Drywells	480	LF	\$	150	\$ 72,000
9	Drywells	24	EA	\$	60,000	\$ 1,440,000
10	Traffic Control and Restriping	1	LS	\$	25,000	\$ 25,000
11	Site Restoration	1	LS	\$	25,000	\$ 25,000
12	Pavement Restroration	5,000	SF	\$	7	\$ 35,000
13	Mobilization/Demobilization	1	LS	\$	331,650	\$ 331,650
14	Contingency @ 30%	1	LS	\$	663,300	\$ 663,300
					Subtotal	\$ 3,205,950
			Plan	ning and	Pemitting	\$ 33,000

 Subtotal
 \$ 3,205,950

 Planning and Pemitting
 \$ 33,000

 Engineering Design
 \$ 289,000

 Construction Management
 \$ 321,000

 Administration
 \$ 97,000

 Total Estimate for MOL 1
 \$ 3,950,000

 Cost per Drywell
 \$ 164,583

MOL 2

Item	Description	Qty	Unit	Unit Price		Total
1	Diversion Structure	1	LS	\$ 96,000	\$	96,000
2	20" PVC to Lift Station	100	LF	\$ 400	\$	40,000
3	Lift Station	1	LS	\$ 324,000	\$	324,000
4	20" PVC to Pretreatment	10	LF	\$ 300	\$	3,000
5	Pretreatment	1	LS	\$ 96,000	\$	96,000
6	20" PVC Distribution	1,650	LF	\$ 300	\$	495,000
7	20"x6" Double Y	0	EA	\$ 6,000	\$	-
8	6" PVC to Drywells	480	LF	\$ 150	\$	72,000
9	Drywells	40	EA	\$ 60,000	\$	2,400,000
10	Traffic Control and Restriping	1	LS	\$ 25,000	\$	25,000
11	Site Restoration	1	LS	\$ 30,000	\$	30,000
12	Pavement Restroration	10,000	SF	\$ 7	\$	70,000
13	Mobilization/Demobilization	1	LS	\$ 547,650	\$	547,650
14	Contingency @ 30%	1	LS	\$ 1,095,300	\$	1,095,300
	_			Subtotal	Ś	5,293,950

Subtotal	\$ 5,293,950
Planning and Pemitting	\$ 53,000
Engineering Design	\$ 477,000
Construction Management	\$ 530,000
Administration	\$ 159,000
Total Estimate for MOL 2	\$ 6,520,000
Cost per Drywell	\$ 163,000

Item	Description	Qty	Unit	Unit Price		Total
1	Diversion Structure	1	LS	\$ 69,000	\$	69,000
2	20" PVC to Lift Station	400	LF	\$ 400	\$	160,000
3	Lift Station	1	LS	\$ 216,000	\$	216,000
4	20" PVC to Pretreatment	45	LF	\$ 300	\$	13,500
5	Pretreatment	1	LS	\$ 74,000	\$	74,000
6	18" PVC Distribution	350	LF	\$ 275	\$	96,250
7	18"x6" Double Y	5	EA	\$ 3,500	\$	17,500
8	18"x6" Y	4	EA	\$ 5,000	\$	20,000
9	6" PVC to Drywells	300	LF	\$ 150	\$	45,000
10	Drywells	14	EA	\$ 60,000	\$	840,000
11	Traffic Control and Restriping	1	LS	\$ 25,000	\$	25,000
12	Site Restoration	1	LS	\$ 25,000	\$	25,000
13	Pavement Restroration	3,500	SF	\$ 7	\$	24,500
14	Mobilization/Demobilization	1	LS	\$ 233,513	\$	233,513
15	Contingency @ 30%	1	LS	\$ 487,725	\$	487,725
				Subtotal	\$	2,346,988
			Planni	ing and Permitting	\$	24,000
			E	ngineering Design	\$	212,000
			Construc	tion Management	\$	235,000
				Administration	\$	71,000

MOL 4

IVIOL 4						
Item	Description	Qty	Unit	Unit Price		Total
1	Diversion Structure	1	LS	\$ 65,000	\$	65,000
2	20" PVC to Lift Station	150	LF	\$ 400	\$	60,000
3	Lift Station	1	LS	\$ 270,000	\$	270,000
4	24" PVC to Pretreatment	630	LF	\$ 300	\$	189,000
5	Pretreatment	1	LS	\$ 102,000	\$	102,000
6	20" PVC Distribution	710	LF	\$ 300	\$	213,000
7	18"x6" Double Y	18	EA	\$ 6,000	\$	108,000
8	6"x6" Y	2	EA	\$ 250	\$	500
9	6" PVC to Drywells	2,610	LF	\$ 150	\$	391,500
10	Drywells	39	EA	\$ 60,000	\$	2,340,000
11	Traffic Control and Restriping	1	LS	\$ 25,000	\$	25,000
12	Site Restoration	1	LS	\$ 35,000	\$	35,000
13	Pavement Restroration	16,000	SF	\$ 7	\$	112,000
14	Mobilization/Demobilization	1	LS	\$ 576,900	\$	576,900
15	Contingency @ 30%	1	LS	\$ 1,173,300	\$	1,173,300
				Subtotal	\$	5,661,200
			Dlama	in a and Dormittina	ċ	F7.000

| Subtotal \$ 5,661,200
| Planning and Permitting \$ 57,000
| Engineering Design \$ 510,000
| Construction Management \$ 567,000
| Administration \$ 170,000
| Total Estimate for MOL 4 \$ 6,970,000
| Cost per Drywell \$ 178,718

Total Estimate for MOL 3

Cost per Drywell \$

2,890,000

206,429

Item	Description	Qty	Unit	Unit Price	Total
1	Diversion Structure	1	LS	\$ 83,000	\$ 83,000
2	20" PVC to Lift Station	110	LF	\$ 400	\$ 44,000
3	Lift Station	1	LS	\$ 211,000	\$ 211,000
4	20" PVC to Pretreatment	35	LF	\$ 300	\$ 10,500
5	Pretreatment	1	LS	\$ 74,000	\$ 74,000
6	18" PVC Distribution	460	LF	\$ 275	\$ 126,500
7	18"x6" Double Y	6	EA	\$ 3,500	\$ 21,000
8	6" PVC to Drywells	120	LF	\$ 150	\$ 18,000
9	Drywells	13	EA	\$ 60,000	\$ 780,000
10	Traffic Control and Restriping	1	LS	\$ 25,000	\$ 25,000
11	Site Restoration	1	LS	\$ 25,000	\$ 25,000
12	Pavement Restroration	3,000	SF	\$ 7	\$ 21,000
13	Mobilization/Demobilization	1	LS	\$ 215,850	\$ 215,850
14	Contingency @ 30%	1	LS	\$ 431,700	\$ 431,700
				Subtotal	\$ 2,086,550
			Plannii	ng and Pemitting	\$ 21,000
			En	gineering Design	\$ 188,000
			Constructi	on Management	\$ 209,000

MOL 6

WIOL 0						
Item	Description	Qty	Unit	l	Jnit Price	Total
1	Catch Basin	2	EA	\$	20,000	\$ 40,000
2	12" PVC to Pretreatment	160	LF	\$	225	\$ 36,000
3	Pretreatment	1	LS	\$	66,000	\$ 66,000
4	12" PVC Distribution	160	LF	\$	200	\$ 32,000
5	12"x6" Double Y	5	EA	\$	3,500	\$ 17,500
6	6" PVC to Drywells	160	LF	\$	150	\$ 24,000
7	Drywells	10	EA	\$	60,000	\$ 600,000
8	Traffic Control and Restriping	1	LS	\$	25,000	\$ 25,000
9	Site Restoration	1	LS	\$	25,000	\$ 25,000
10	Pavement Restroration	3,500	SF	\$	7	\$ 24,500
11	Mobilization/Demobilization	1	LS	\$	133,500	\$ 133,500
12	Contingency @ 30%	1	LS	\$	267,000	\$ 267,000
					Subtotal	\$ 1,290,500

Administration

Cost per Drywell

Total Estimate for MOL 5

\$

63,000

2,570,000

197,692

ltem	Description	Qty	Unit	Unit P	rice	Total
1	Diversion Structure	2	LS	\$ 9	92,000	\$ 184,000
2	20" PVC to Lift Station	135	LF	\$	400	\$ 54,000
3	Lift Station	1	LS	\$ 28	35,000	\$ 285,000
4	20" PVC to Pretreatment	110	LF	\$	300	\$ 33,000
5	Pretreatment	1	LS	\$ 9	92,000	\$ 92,000
6	20" PVC Distribution	540	LF	\$	300	\$ 162,000
7	20"x6" Double Y	12	EA	\$	6,000	\$ 72,000
8	20"x6" Y	4	EA	\$	5,000	\$ 20,000
9	6" PVC to Drywells	630	LF	\$	150	\$ 94,500
10	Drywells	28	EA	\$ 6	50,000	\$ 1,680,000
11	Traffic Control and Restriping	1	LS	\$ 2	25,000	\$ 25,000
12	Site Restoration	1	LS	\$ 3	30,000	\$ 30,000
13	Pavement Restroration	5,500	SF	\$	7 :	\$ 38,500
14	Mobilization/Demobilization	1	LS	\$ 38	37,900	\$ 387,900
15	Contingency @ 30%	1	LS	\$ 83	31,000	\$ 831,000
				Su	btotal	\$ 3,988,900
			Dlan	ning and Dam	itting	¢ 40,000

Subtotal	\$ 3,988,900
Planning and Pemitting	\$ 40,000
Engineering Design	\$ 360,000
Construction Management	\$ 399,000
Administration	\$ 120,000
Total Estimate for MOL 7	\$ 4,910,000
Cost per Drywell	\$ 175,357

Preliminary Cost Estimate - Site Summary

				En	ngineering Design	C	Construction		
Location	# of Drywells	Pla	anning Cost		Cost		Cost		Total Cost
MOL 1	24	\$	33,000	\$	289,000	\$	3,628,000	\$	3,950,000
MOL 2	40	\$	53,000	\$	477,000	\$	5,990,000	\$	6,520,000
MOL 3	14	\$	24,000	\$	212,000	\$	2,654,000	\$	2,890,000
MOL 4	39	\$	57,000	\$	510,000	\$	6,403,000	\$	6,970,000
MOL 5	13	\$	21,000	\$	188,000	\$	2,361,000	\$	2,570,000
MOL 6	10	\$	13,000	\$	117,000	\$	1,460,000	\$	1,590,000
MOL 7	28	\$	40,000	\$	360,000	\$	4,510,000	\$	4,910,000
Totals	168	\$	241,000	\$	2,153,000	\$	27,006,000	\$	29,400,000

Note:

- 1. Line items include material, labor and equipment usage costs
- 2. Contigency includes potential complications during the later permitting, site investigation, staging, and site access stages.
- 3. Construction cost includes constuction management and administration.



ATTACHMENTS FOR SECTION 5.1:

COMMUNITY INVESTMENT





engineers | scientists | innovators

Flood Risk Mitigation Analysis

Metro Orange Line Water Infiltration and Quality Project

1. INTRODUCTION AND MOEDEL DEVELOPMENT

To support the Metro Orange Line Water Infiltration and Quality Project (Project)'s community investment benefit in improving flood management, flood conveyance, or flood risk mitigation. A simplified hydrologic analysis was performed to determine the peak flow rate from a 2-year, 24-hour design storm event before and after Project implementation. The analyses were based on the Modified Rational Method ("MODRAT") per the Los Angeles County Hydrology Manual using the LA County Department of Public Works "HydroCalc Calculator". Required inputs for the HydroCalc Calculator include area, flow path length, flow path slope, imperviousness, and storm depth, which were determined as outlined below

- **Design Storm Depth**: Per the LA County's Hydrology Map¹, the 50-year 24-hour isohyet for the Site is 7.55 inches. According to the Los Angeles County Hydrology Manual, the isohyet reduction to convert a 50-year 24-hour storm event to a 2-year 24-hour storm event is 0.387. The resultant 10-year 24-hour isohyet for the Site was computed as 2.92 inches.
- **Soils Type**: The dominant soil type for each drainage area, obtained form LA County's Hydrology Map¹ was applied
- Flow Path Length and Slope: The flow path is defined as the longest distance between the most remote point within a subcatchment to the proposed stormwater conveyance feature. Both flow path length and slope determined by reviewing the contours and elevations provided in the Grading Plan. It should be noted that if a flow path has varying slopes, the maximum slope was used to produce a more conservative flow estimate
- **Site Area and Imperviousness:** Acreage and area-weighted imperviousness were computed using WMMS 2.0 database to maintain modelling consistency throughout this Project. Please refer to the hydrologic modelling attachment uploaded under the "Water Quality" section of this application for detailed description and exhibits on Project drainage area and imperviousness.
- **BMP Performance:** The peak flow reduction capacity of the proposed BMP was assumed to be equivalent to the maximum infiltration capacities. As discussed in the geotechnical PDF attachment uploaded in "Design- Elements Site Condition" section of this application, a design infiltration rate of 0.8 cfs/drywell was calculated based on review of available boring log and Cone Penetration Test (CPT) data.

1

¹ https://dpw.lacounty.gov/wrd/hydrologygis/

2. RESULTS

Key inputs and results from the HydroCalc model are summarized in Table 1. All model input and output files are provided in Appendix A.

Table 1. Summary of Model Key Inputs and Results (24-Hour 2-Year Design Storm)

		Key Modeling Inpu	ut	
Design Storm	Rainfall Total (in	ches)		1.1
Total Number of Drywells Modeled			168	
Infiltration Capacity per Drywell (cfs)			0.8	
Key Modeling Output				
		Peak Discharge	Peak Discharg	e Peak
Drywell	Number of	Rate – Existing	Rate - Propose	d Discharge
Cluster	Drywells	Condition	Condition	Reduction
		(cfs)	(cfs)	(%)
MOL-1	24	161	141	12%
MOL-2	40	364	332	9%
MOL-3	14	117	106	10%
MOL-4	39	309	278	10%
MOL-5	13	90	80	12%
MOL-6	10	38	30	21%
MOL-7	28	138	116	16%

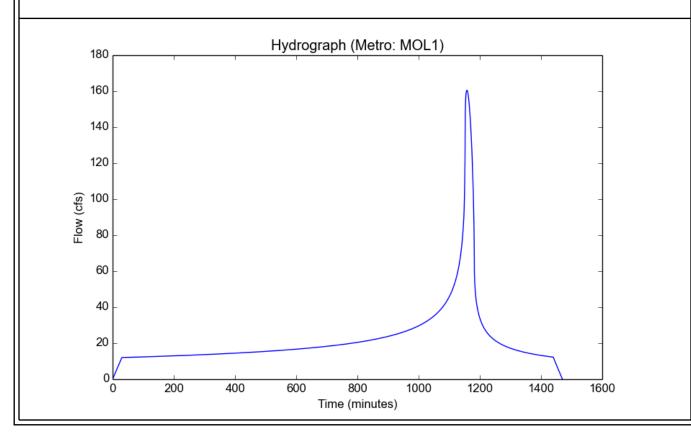
In summary, the proposed Project can reduce the peak discharge by at least 9% during a 24-hour 2-year design storm from the Project drainage area. Considering that the proposed Project is primarily designed for water quality and water supply benefits, the peak flow reduction capacity of the Project can provide additional flood risk mitigation benefit by reducing localized flooding risk at MOL-6, where street runoff will be directly diverted to the BMP, and restoring capacity of the drainage system at the remaining Project sites, where stormwater runoffs will be diverted from the existing storm drains.

APPENDIX A HydroCalc Input and Output

File location: P:/GIS/Metro FS LA0583005/Project/Hydrocalc_SWMM/Metro Report.pdf Version: HydroCalc 1.0.3

Project Name	Metro
Subarea ID	MOL1
Area (ac)	308.496592
Flow Path Length (ft)	8450.0
Flow Path Slope (vft/hft)	0.473372781
50-yr Rainfall Depth (in)	7.55
Percent Impervious	0.625319781
Soil Type	5
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

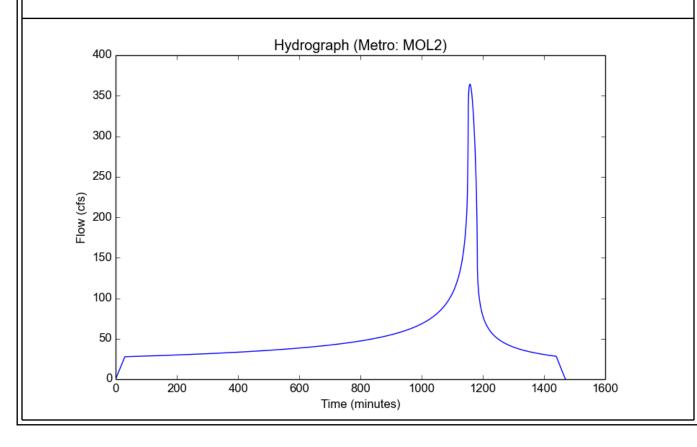
o arpara recourse	
Modeled (2-yr) Rainfall Depth (in)	2.9219
Peak Intensity (in/hr)	0.751
Undeveloped Runoff Coefficient (Cu)	0.3472
Developed Runoff Coefficient (Cd)	0.6929
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	160.5201
Burned Peak Flow Rate (cfs)	160.5201
24-Hr Clear Runoff Volume (ac-ft)	45.3232
24-Hr Clear Runoff Volume (cu-ft)	1974278.2398



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Project Name	Metro
Subarea ID	MOL2
Area (ac)	682.6383133
Flow Path Length (ft)	13400.0
Flow Path Slope (vft/hft)	0.559701493
50-yr Rainfall Depth (in)	7.55
Percent Impervious	0.656980016
Soil Type	5
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Modeled (2-yr) Rainfall Depth (in)	2.9219
Peak Intensity (in/hr)	0.751
Undeveloped Runoff Coefficient (Cu)	0.3472
Developed Runoff Coefficient (Cd)	0.7104
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	364.1701
Burned Peak Flow Rate (cfs)	364.1701
24-Hr Clear Runoff Volume (ac-ft)	104.3524
24-Hr Clear Runoff Volume (cu-ft)	4545589.3228

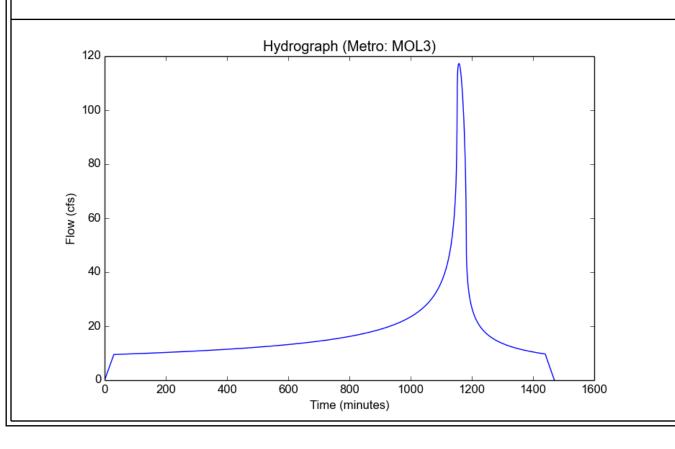


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Input	Param	eters
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Project Name	Metro
Subarea ID	MOL3
Area (ac)	197.3397745
Flow Path Length (ft)	9900.0
Flow Path Slope (vft/hft)	0.595959596
50-yr Rainfall Depth (in)	7.55
Percent Impervious	0.803537472
Soil Type	5
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Modeled (2-yr) Rainfall Depth (in)	2.9219
Peak Intensity (in/hr)	0.751
Undeveloped Runoff Coefficient (Cu)	0.3472
Developed Runoff Coefficient (Cd)	0.7914
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	117.283
Burned Peak Flow Rate (cfs)	117.283
24-Hr Clear Runoff Volume (ac-ft)	35.6018
24-Hr Clear Runoff Volume (cu-ft)	1550816.51

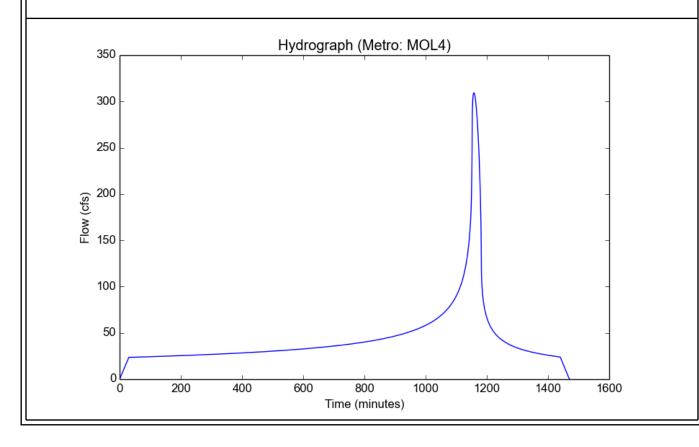


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Input	Param	eters
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Project Name	Metro
Subarea ID	MOL4
Area (ac)	578.7433969
Flow Path Length (ft)	13400.0
Flow Path Slope (vft/hft)	0.447761194
50-yr Rainfall Depth (in)	7.55
Percent Impervious	0.659527471
Soil Type	5
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Modeled (2-yr) Rainfall Depth (in)	2.9219
Peak Intensity (in/hr)	0.751
Undeveloped Runoff Coefficient (Cu)	0.3472
Developed Runoff Coefficient (Cd)	0.7118
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	309.3569
Burned Peak Flow Rate (cfs)	309.3569
24-Hr Clear Runoff Volume (ac-ft)	88.7474
24-Hr Clear Runoff Volume (cu-ft)	3865837.3508

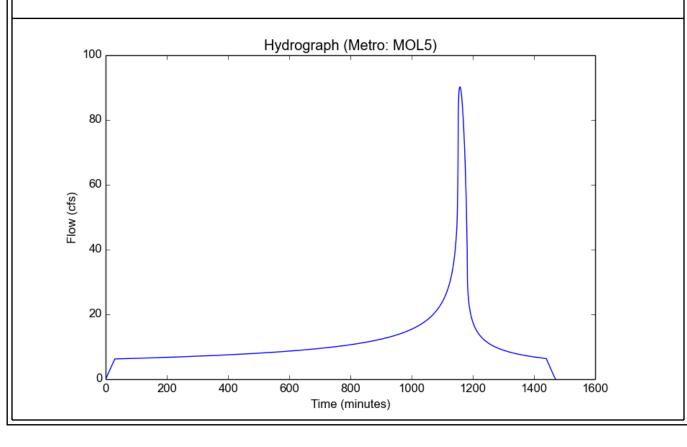


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Input	Param	eters
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Project Name	Metro
Subarea ID	MOL5
Area (ac)	192.8286561
Flow Path Length (ft)	5687.0
Flow Path Slope (vft/hft)	0.492350976
50-yr Rainfall Depth (in)	7.55
Percent Impervious	0.499230856
Soil Type	5
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Modeled (2-yr) Rainfall Depth (in)	2.9219
Peak Intensity (in/hr)	0.751
Undeveloped Runoff Coefficient (Cu)	0.3472
Developed Runoff Coefficient (Cd)	0.6232
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	90.2404
Burned Peak Flow Rate (cfs)	90.2404
24-Hr Clear Runoff Volume (ac-ft)	23.7604
24-Hr Clear Runoff Volume (cu-ft)	1035004.0133

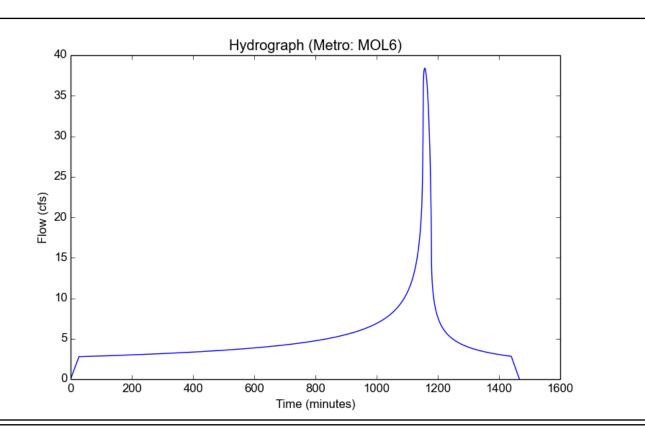


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Input	Param	eters
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Project Name	Metro
Subarea ID	MOL6
Area (ac)	67.21583708
Flow Path Length (ft)	4900.0
Flow Path Slope (vft/hft)	0.632653061
50-yr Rainfall Depth (in)	7.55
Percent Impervious	0.671505367
Soil Type	5
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

o a tpat i too a ito	
Modeled (2-yr) Rainfall Depth (in)	2.9219
Peak Intensity (in/hr)	0.7891
Undeveloped Runoff Coefficient (Cu)	0.3644
Developed Runoff Coefficient (Cd)	0.724
Time of Concentration (min)	27.0
Clear Peak Flow Rate (cfs)	38.4038
Burned Peak Flow Rate (cfs)	38.4038
24-Hr Clear Runoff Volume (ac-ft)	10.4691
24-Hr Clear Runoff Volume (cu-ft)	456031.8613

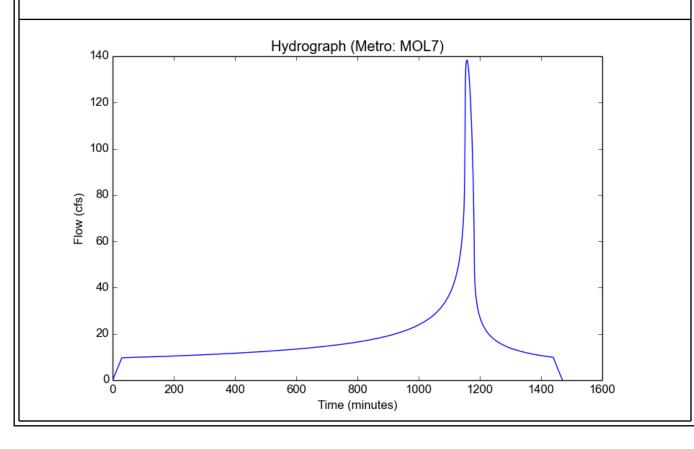


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Input	Param	eters
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Project Name	Metro
Subarea ID	MOL7
Area (ac)	291.6933542
Flow Path Length (ft)	7200.0
Flow Path Slope (vft/hft)	0.472222222
50-yr Rainfall Depth (in)	7.55
Percent Impervious	0.514436869
Soil Type	5
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

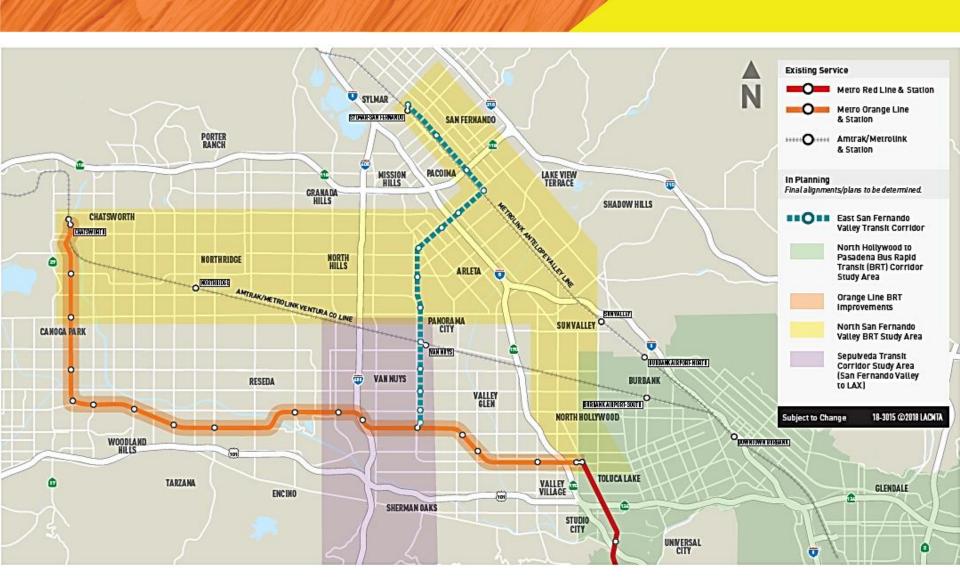
Modeled (2-yr) Rainfall Depth (in)	2.9219
Peak Intensity (in/hr)	0.751
Undeveloped Runoff Coefficient (Cu)	0.3472
Developed Runoff Coefficient (Cd)	0.6316
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	138.3488
Burned Peak Flow Rate (cfs)	138.3488
24-Hr Clear Runoff Volume (ac-ft)	36.7761
24-Hr Clear Runoff Volume (cu-ft)	1601968.3957





Measure M Transit Projects in San Fernando Valley





Measure M Transit Projects Schedule



Project	Expected Opening Date (3 year range)
Orange Line BRT Improvements	FY 2025-27
North SFV BRT Improvements	FY 2023-25
North Hollywood to Pasadena Corridor BRT	FY 2022-24
East SFV Transit Corridor - Van Nuys Blvd.	FY 2027-29
Sepulveda Transit Corridor (two phases)	Phase 1 FY2026-28 Phase 2 FY2033-35
Orange Line Conversion to Rail	FY 2057

Project Funding



> Phase 1: BRT Improvements

- Measure M and SB-1 Local Partnership Grant Program: \$361 million
- Groundbreaking: Oct. 2018
- Opening: Winter 2024/25

Phase 2: BRT Conversion to LRT

- Measure M: \$1.4 billion
- Groundbreaking: 2051





Oct. 2018 Groundbreaking Ceremony at Sepulveda Park & Ride

Timeline and Process



BOARD APPROVED
TECHNICAL STUDY
FINDINGS &
RECOMMENDATIONS &
PROJECT DEVELOPMENT

OCT 2017

INITIATE TRAFFIC STUDY, PILOT GATE, & CONCEPTUAL ENGINEERING

DEC 2017

BOARD APPROVED
UPDATED PROJECT
DESCRIPTION

CEQA STATUTORY EXEMPTION

JULY 2018

GROUND-BREAKING

INITIATE AUR

CONTINUE TRAFFIC STUDY, PILOT GATE, & CE ...

OCT 2018

ONGOING TRAFFIC STUDY, PILOT GATE, AUR

INITIATE PE & ROW

COMMUNITY MEETINGS

2019

FINAL DESIGN

AUR

ROW ACQUISITIONS

CONSTRUCTION

2020-2024

ONGOING PUBLIC OUTREACH

AUR = Advanced Utility Relocation

CEQA = California Environmental Quality Act

CE = Conceptual Engineering

PE = Preliminary Engineering

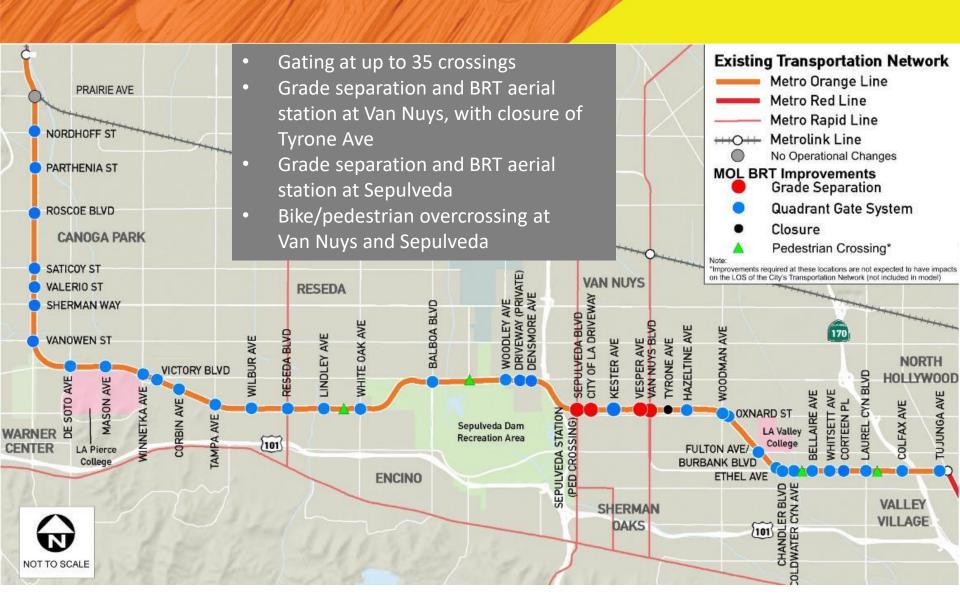
ROW = Right-of-Way Property Acquisition Process

(Timeline Subject to Change)



Orange Line BRT Improvements





Gate Systems





Bus Operations with Gates





Grade Separations (GS)



Project Elements:

- ➤ GS and aerial station at Sepulveda Blvd
- ➤ GS and aerial station at Van Nuys, with closure of Tyrone Ave
- ➤ Bike/pedestrian path grade separation at Van Nuys and Sepulveda
- Connectivity with Sepulveda and East San Fernando Valley Transit Projects



MOL - Sepulveda Grade Separation Rendering

Grade Separations (GS)



Aerial Station Design Features:

- ➤ Side Platforms. 42' Busway (3-14' wide Bus lanes)
- ➤ 1 escalator, 1 set of stairs, 2 elevators, and provision for a future second escalator at all 4 corners
- Designed for future conversion to LRT
- ➤ Elevated bike path on the north side of elevated busway. Bike Parking at Plaza Level
- > Artwork

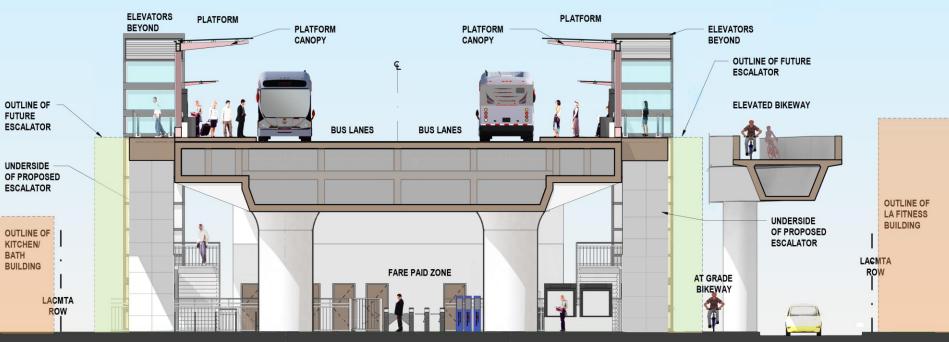


Elevated Bike Path at Sepulveda and Van Nuys Crossings



Conceptual rendering; subject to change; not to scale

Source: MM/GF

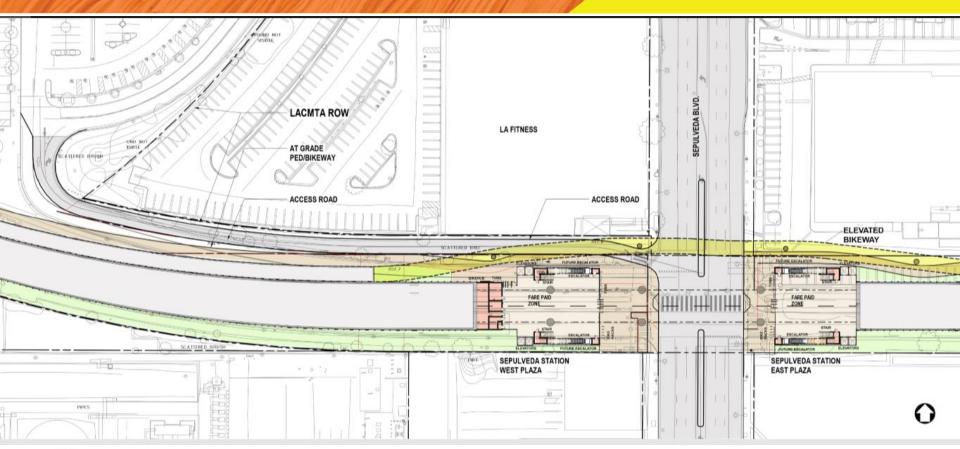






Elevated Bike Path at Sepulveda Crossing







Conceptual rendering; subject to change; not to scale

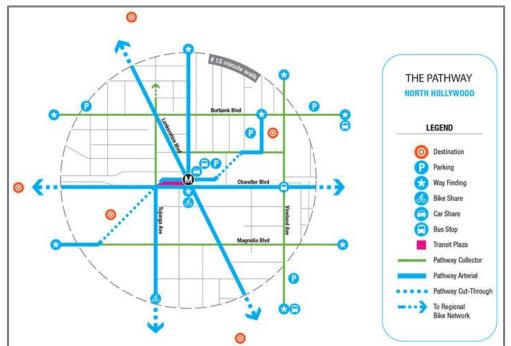
Pedestrian & Bicycle Access



First/Last Mile Component:



- Most riders access Metro stations without a car
- Study to identify key access routes and plan specific improvements for pedestrians and bicycle riders

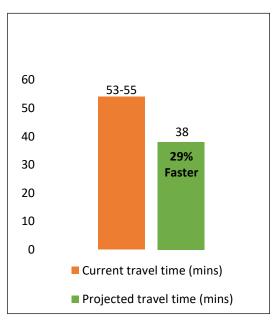


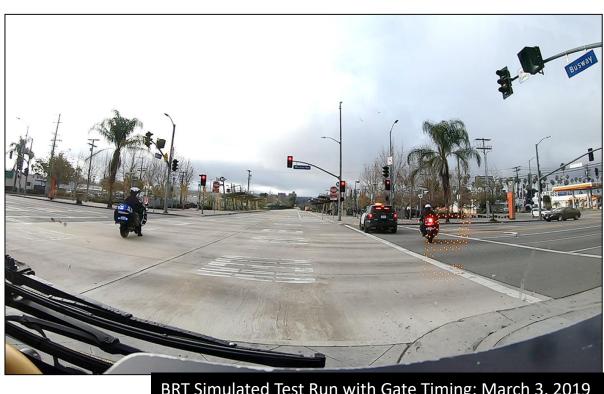


Project Benefits









BRT Simulated Test Run with Gate Timing: March 3, 2019

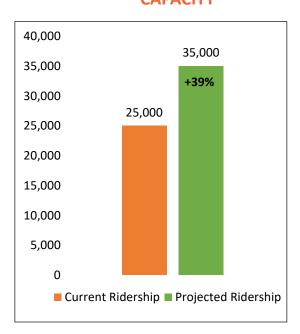


Project Benefits





IMPROVED RIDERSHIP & CAPACITY







Project Benefits



Improvement / Benefit

IMPROVED SAFETY

Existing Conditions (North Hollywood to Chatsworth)

- Right-turn-on-red violations
 - 5,000 6,000 monthly violations in 2018
- Collisions
 - 24 collisions in 2018

Gates + Grade Separations at Van Nuys and Sepulveda

- Avoids right-turn-on-red violations
- Reduces the risk of collisions







Zero Emission Buses



- ➤ 45 new battery electric buses
- > Benefits:
 - No tailpipe emissions
 - Quieter operation
 - Electric drive motors
 - Electric accessories
 - Better performance
 - Better ride quality





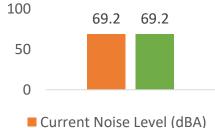
Noise Study Results





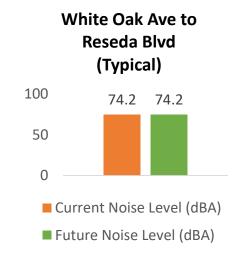
Quieter electric buses offset the noise introduced by the gate warning bells. Plans to run two bus 'platoons' to increase capacity during rush hour reduces the number of times the bells would be triggered.

Laurel Cyn Blvd to Coldwater Cyn Blvd (Typical)



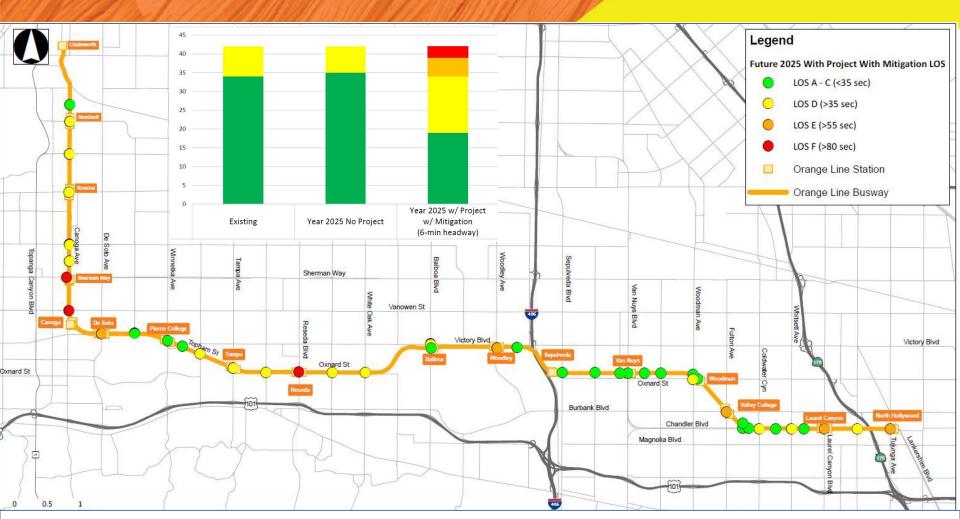






2025 Traffic Analysis Results 6-minute headways (PM Peak Hr)

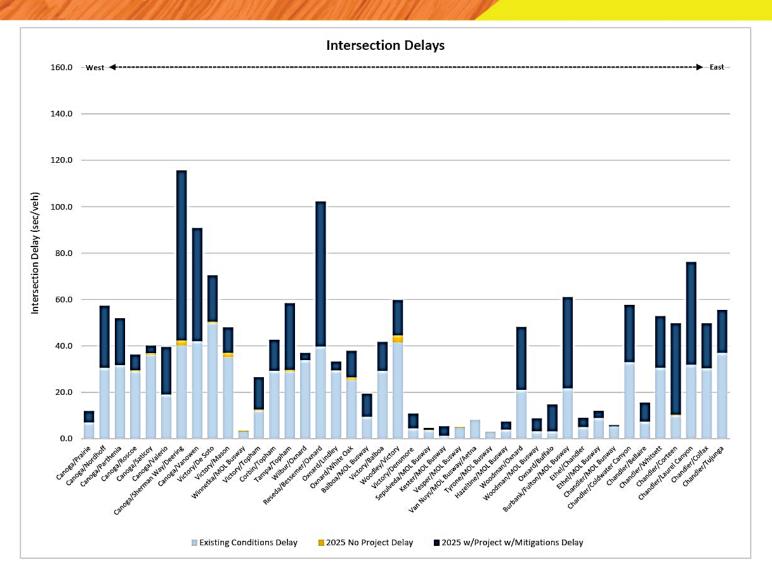




- 23 of 42 analyzed intersections are significantly impacted by the Project, per LADOT "significant" traffic impact thresholds
- 34 intersections (81%) are projected to operate at LOS D or better
- 8 Intersections at LOS E/F.

Existing Plus Project-related Overall Intersection Delay Increase (PM Peak Hr)





Mitigation Measures



- ➤ Signal Phasing Modifications
- ➤ Street Reconfigurations
- ➤ Additional mitigation measures to be considered based on:
 - Pilot gates
 - Innovative technology for gate activation system
 - Bus platooning options



Community Outreach



- Community Open House Meetings
 - March 26, 2019, 7:30 10:00am Rose Goldwater Community Center 21710 Vanowen St. Canoga Park, CA 91303
 - March 27, 2019, 4:30 7:00pm North Hollywood Senior Center 5301 Tujunga Ave North Hollywood, CA 91601
- San Fernando Valley Service Council Presentation
 - April 3rd

- ➤ Pop-up events at MOL stations
- ➤ Metro Real Estate ongoing property owner/tenant contact





We Want to Hear From You





Fulgene Asuncion
Project Manager, Metro
One Gateway Plaza, 99-22-4
Los Angeles, CA 90012



888.316.3889





orangeline@metro.net



metro.net/orangeline







ATTACHMENTS FOR SECTION 5.2:

LOCAL SUPPORT



RE: Clean, Safe Drinking Water Program FY 21-22 – Metro Orange Line (MOL) Water Infiltration and Quality Project

To whom it may concern,

I am pleased to submit this letter of support for the Los Angeles County Metropolitan Transportation Authority (LA Metro) and Los Angeles Department of Water and Power proposal for the Safe, Clean Water Program.

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to implement 168 drywells across seven locations along the MOL with pretreatment facilities to capture, treat, and infiltrate stormwater runoff from 2,300 acres, resulting in an estimated groundwater recharge yield between 780 and 1,050 acre-feet/ year into the San Fernando Groundwater Basin. LA Metro's extensive land holdings and fortuitous siting within the highest value groundwater recharge areas within the region would allow for large-scale infiltration and aquifer recharge and has the potential to capture enough stormwater to allow Metro to become net water positive.

The Project will be integrated and developed as part of the MOL Bus Rapid Transit Improvements Project, which will increase bus speeds by 29%, improve ridership by 39%, and enhance safety. LA Metro is also in the process of fully electrifying their MOL bus fleet with zero emission electric buses.

Metro has been receptive to community feedback, which called for educational signage about the water supply benefits of this drywell project as well as workforce development for the maintenance of these drywells. Metro will be overseeing a large portfolio of capital infrastructure projects in the years ahead. Funding this project will encourage Metro to continue to think about maximizing multi-benefits through green infrastructure as it leaves its imprints on the region.

Thank you for your consideration of my support. Should you have any questions regarding my support, you may contact me at blindblad@climateresolve.org / 213-634-3790 x102.

Sincerely,

Bryn Lindblad Deputy Director

Bry Linebblad



October 13, 2020

Safe Clean Water Program County of Los Angeles Department of Public Works P.O. Box 1460 Alhambra, CA 91802-1460

RE: Safe Clean Water Program FY 21-22 – Metro Orange Line (MOL) Water Infiltration and Quality Project

Dear Safe Clean Water Program:

The Council for Watershed Health (CWH) is pleased to support the **Metro Orange Line (MOL) Water Infiltration and Quality Project** proposal submitted by Los Angeles County Metropolitan Transportation Authority (LA Metro) and Los Angeles Department of Water and Power.

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to implement 168 drywells across seven locations along the MOL with pretreatment facilities to capture, treat, and infiltrate stormwater runoff from 2,300 acres, resulting in an estimated groundwater recharge yield between 780 and 1,050 acre-feet/ year into the San Fernando Groundwater Basin. LA Metro's extensive land holdings and fortuitous siting within the highest value groundwater recharge areas within the region would allow for large-scale infiltration and aquifer recharge and has the potential to capture enough stormwater to allow Metro to become net water positive. The Project will be integrated and developed as part of the MOL Bus Rapid Transit Improvements Project, which will increase bus speeds by 29%, improve ridership by 39%, and enhance safety. LA Metro is also in the process of fully electrifying their MOL bus fleet with zero emission electric buses.

The Metro Orange Line Water Infiltration and Quality Project aligns with CWH's mission to advance the health and sustainability of our region's watersheds, rivers, streams and habitat both in natural areas and urban neighborhoods. CWH sees this Project as an important opportunity to manage stormwater runoff more sustainably and strongly supports this Project.

Thank you for your consideration of CWH's support. Please feel free to contact me with any questions.

Sincerely,

Eileen Alduenda Executive Director eileen@watershedhealth.org



METRO ORANGE LINE IMPROVEMENTS PROJECT March 2019 Community Meetings Summary Report

DRAFT 06-05-2019









DRAFT: 05/17/2019

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Appendix A	Community Meeting Take-One (English/Spanish)
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Community Meeting Comment Card (English/Spanish)



Appendix H

ABBREVIATIONS / ACRONYMS

BRT - Bus Rapid Transit

CNG - Compressed Natural Gas

LADOT – Los Angeles Department of Transportation

LRT - Light Rail Transit

MOL – Metro Orange Line

Metro – Los Angeles County Metropolitan Transportation Authority

SB-1 - Senate Bill 1

Q&A – Questions and Answers



1. Introduction

The Los Angeles County Metropolitan Transportation Authority (Metro) serves as the lead agency for the design and implementation of a range of transportation services in Los Angeles County, including improvements to countywide bus and light rail transit (LRT) operations, regional rail and Metrolink passenger rail operations, and freeway systems. Metro's mission is to provide continuous improvement of an efficient and effective transportation system for Los Angeles County.

The Metro Orange Line (MOL) Bus Rapid Transit (BRT), serving the San Fernando Valley from Chatsworth to North Hollywood, is the most successful BRT system in Los Angeles County and is considered the premier BRT Line in the United States. The MOL is essentially an extension of the Metro Red Line and expands access in the Valley to Metro's 120-mile rail system that crisscrosses Los Angeles County. The MOL includes rail-like amenities, dedicated right-of-way, advanced 60-foot Compressed Natural Gas (CNG) buses and signal priority system that navigates buses more efficiently through intersections.

Since its opening in 2005, the Metro Orange Line has become one of the most successful Bus Rapid Transit (BRT) lines in the country. Average daily ridership on this 18-mile corridor from North Hollywood to Chatsworth has reached 29,000 boardings per day.

The approved Metro Orange Line Improvements Project includes building up to 35 railroad-style gates at intersections along the Orange Line and constructing grade-separated structures to elevate the busway, bike path and associated stations at Van Nuys BI and Sepulveda BI.

Funding from Measure M and the SB1 Local Partnership Program grant provide up to \$320 million for the Metro Orange Line Improvements Project, which will improve bus travel times and safety along the corridor.

The Orange Line provides a critical link in the transportation network Metro is building to transform the San Fernando Valley and improve regional mobility.

The Orange Line is expected to connect to four other transit projects with funding from Measure M:

- East San Fernando Valley Transit Corridor
- Sepulveda Transit Corridor
- North Hollywood to Pasadena BRT
- North San Fernando Valley BRT

As part of the Project development process, Metro is committed to a comprehensive outreach program that provides project stakeholders with the necessary tools and resources to be educated and informed and to provide valuable input at key milestones.

A series of project kick-off open houses were held in late November and early December 2017, which served as the first round of public involvement on the MOL BRT Improvements Project.

In March 2018, in partnership with the San Fernando Valley Council of Governments, Metro hosted a half-day tour of the Metro Expo Line for approximately 30 elected and city staff, as well as local transit advocates. The tour group traveled from the MOL Sepulveda Station to Westwood and then rode the

Expo Line to Santa Monica to allow attendees to see and experience elements of the Expo Line that will be similar to the planned improvements along the Metro Orange Line, including quad/ped gates, etc.

In June 2018, Metro held community open houses in Van Nuys and North Hollywood to provide stakeholders with an update on Metro projects in the San Fernando Valley, including the MOL Project, the launch of the Warner Center Bus Shuttle and other related projects.

In March 2019, Metro hosted two community meetings in Canoga Park and North Hollywood to present an update on the project, including details on the pilot gate, grade separations, and traffic/noise analysis. Attendees also had an opportunity to talk directly to Metro staff and ask questions.

This summary documents activities leading up to and during the two community meetings.

2. Approach and Strategy

Prior to the public meetings, the project team hosted two elected/city staff briefings and conducted project awareness at six MOL stations.

The following is a summary timeline for outreach activities.

Table 2-1 Notification Period & Timeline

Date	Activity/Event	Target Audience
Monday, February 25	City of Los Angeles elected briefing	Elected/city staff
Week of March 4	Distribute eblast invite for elected briefing	Elected/city staff
Week of March 11	 Distribute general public eblast Facebook advertising begins Take-one distribution to Metro divisions and municipal operators Social media toolkit distributed to elected offices and neighborhood councils Source/El Pasajero posts announcing meeting dates 	General public
Week of March 18	Elected city/staff briefing (3/18/19)Metro Orange Line Station outreach	 Elected/city staff Transit users
Tuesday, March 26	Public Meeting #1 Rose Goldwater Room Westfield Topanga Mall	General public/ stakeholders
Wednesday, March 27	Public Meeting #2 North Hollywood Senior Center	General public/ stakeholders
Week of April 1	Thank You Eblast	General public/ stakeholders

3. Notification of Community Open House

To promote maximum public awareness, a variety of noticing methods were implemented in advance of the community meetings. These included:

- Electronic distribution (4 eblasts)
- Take-one distribution at six Metro Orange Line Stations
- Take-one distribution aboard the Metro Orange Line and other Metro bus lines
- Media coverage (earned media) and extended outreach
- Social media boosted posts and advertisements
- Phone calls and emails by Metro to targeted key stakeholders
- Project communication tools website and helpline

All forms of noticing provided meeting details (dates, times, locations, and language services), as well as contact information for accessing additional project details.

3.1 Take-Ones

A take-one (**Appendix A**) was developed in English and Spanish. The meeting notice included information on the community meetings, including the dates, times and locations, as well as the project website, helpline and email. A total of 17,570 take-ones were distributed as follows:

- Division 2, 8 and 15 serving the San Fernando Valley: 15,075
- ➤ Metro Orange Line: 1,025
- ➤ Metro Customer Centers and other locations: 700
- Distribution at six Metro Orange Line stations: 770

3.2 Car cards on Orange Line buses

Car cards were developed to display on all Orange Line buses (Appendix B). The cards were posted on the entire fleet on January 22, 2019 and will run through June 3, 2019. The cards were intended to advise current Orange Line riders about upcoming improvements to the line, including bridges (grade separations) and gates.

3.3 E-blasts

An electronic version of the notice (Appendix B) was distributed in English and Spanish via e-blast to over **1,044** contacts included in the project database a total of four (4) times in advance of the Community Open House Meetings in March 2019. A final e-blast in English and Spanish with links to the meeting materials and project website was sent on Tuesday, April 2, 2019 to over **1,071** contacts in the database (including those who provided contact information at the meetings).

Table 3-1 E-blast Distribution Schedule

No.	E-Blast Type	Date Sent	Recipients	Views/Opens	Open Rate
1	Initial meeting notice	March 7, 2019	1,044	235	29.5%
2	Reminder #1, meeting notice	March 13, 2019	1,048	224	27.9%
3	Reminder #2, meeting notice	March 19, 2019	1,048	231	29.1%
4	Reminder #3, meeting notice	March 25, 2019	1,046	216	27.7%
5	Thank you notice	April 2, 2019	1,071	231	28.7%

3.3 Information Distribution at MOL Stations

The outreach team set up information pop-ups to distribute take-ones as noted below to provide transit riders with information about the meetings in English and Spanish at the Van Nuys, Canoga, Valley College, North Hollywood, Reseda and Sepulveda MOL Stations during peak commuter travel times. The purpose of the pop-ups was to provide project and community meeting awareness to riders. Many of our station outreach activities were conducted by Spanish-speaking staff. Staff communicated in Spanish as appropriate to convey details about the upcoming meetings and relay project information but no specific data regarding Spanish engagement was collected since no survey was underway and this effort was mostly a "get-out-the-word" type of engagement.



Sepulveda Station Outreach



Van Nuys Station Outreach

Table 3-2 Station Outreach

No.	Station	Date	Rider Engagement
1	Van Nuys Station	March 18, 2019, 6-8am	100
2	Canoga Station	March 19, 2019, 6-8 am	160
3	Valley College Station	March 19, 2019, 11am-1pm	60
4	North Hollywood Station	March 19, 2019, 4-6pm	150
5	Reseda Station	March 21, 2019, 6-8am	50
6	Sepulveda Station	March 21, 2019, 6-8am	250



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3.4 Advertisements

Social Media

Metro took the lead in online advertising and social media. Prior to the meetings, a Facebook ad linking to the Source article was run in English and a Facebook ad linking to the El Pasajero article was run in Spanish extending out a distance of .5-1 mile around the Metro Orange Line. Table 3-3 below identifies the flight date for each advertisement, as well as reach and engagement data.

Table 3-3 Social Media Advertisements

No.	Social Media	Ad Focus	Publication Dates	Metrics
1.	Facebook	Link to El Pasajero Article (Spanish)	March 14, 2019 – March 27, 2019	Source Clicks: 807 Ad Reach: 23,542 Frequency: 1.91 Impressions: 45,003 Reactions: 258 Shares: 41 Comments: 20
2.	Facebook	Link to The Source Article	March 14, 2019 – March 27, 2019	Source Clicks: 1,511 Ad Reach: 47,917 Frequency: 1.97 Impressions: 94,531 Reactions: 286 Shares: 38 Comments: 53
1.	Facebook	Post-Community Meeting Ad (Spanish)	April 5, 2019 – April 19, 2019	Source Clicks: 472 Ad Reach: 27,607 Frequency: 1.55 Impressions: 42,866 Reactions: 117 Shares: 15 Comments: 21
2.	Facebook	Post-Community Meeting Ad (English)	April 5, 2019 – April 19, 2019	Source Clicks: 774 Ad Reach: 35,765 Frequency: 1.67 Impressions: 59,863 Reactions: 129 Shares: 11 Comments: 11

3.5 Elected/City Staff Briefings

Metro hosted two elected/city staff briefings to provide an update on the Orange Line BRT Improvements Project and a preview of upcoming community meetings, including updates on the pilot gate, grade separations, and traffic analysis. Participants were provided a package of "Take One" pamphlets for distribution and/or placement at their local offices.



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The first briefing was held on Monday, February 25, 2019 at Los Angeles City Hall and included representatives from the following offices and city departments:

- Councilmember Nury Martinez
- Councilmember Bob Blumenfield
- Councilmember David Ryu
- Councilmember Paul Koretz
- Councilmember Paul Krekorian
- Councilmember Greig Smith
- Los Angeles Department of Transportation

The second briefing was held on Monday, March 18, 2019 at the Van Nuys State Office Building and included representatives from the following offices:

- State Senator Robert Hertzberg
- Assemblymember Luz Rivas
- > Assemblymember Jesse Gabriel
- Assemblymember Christy Smith
- Los Angeles County Supervisor Sheila Kuehl
- Councilmember Bob Blumenfield
- Councilmember Paul Krekorian

3.6 Extended Outreach

Prior to the meetings, the outreach team sent information out to elected offices and key stakeholders including 11 nearby Neighborhood Councils. Following is a summary of the extended outreach coverage.

Table 3-4 Extended Outreach Coverage

Soi	ırce	Article Title
1.	Councilmember Paul Krekorian Facebook	Post on March 21, 2019
2.	Councilmember Bob Blumenfield Facebook	Posts on March 19, 2019 and March 26, 2019
3.	Warner Connects Facebook & Twitter	Posts on March 11, 2019
4.	Neighborhood Council Valley Village	Metro Orange Line BRT Project Community Meeting
5.	Greater Valley Glen Council	Metro Orange Line BRT Project Community Meeting
6.	Van Nuys Neighborhood Council	Metro Orange Line BRT Project Community Meeting
7.	NoHo West Neighborhood Council	Metro Orange Line BRT Project Community Meeting
8.	North Hollywood North East Neighborhood Council	Metro Orange Line Community Meeting
9.	Valley Industry and Commerce Association (VICA)	Metro Orange Line BRT Improvements and Project Open House
10.	Woodland Hills Warner Center Neighborhood Council	Metro Orange Line Improvements Project Info



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3.7 Earned Media

Metro Public Relations posted to the Metro blog (The Source/El Pasajero) and responded to media queries. Table 3-4 below provides an overview of the extended outreach/earned media. Screenshots of this coverage is available in **Appendix C.**

Table 3-5 Earned Media

Media Outlet	Article Title	Published Date
1. GreenBiz	Here's the 101: How to create transit- oriented communities in Los Angeles	3/12/2019
2. The Hub – LA (Blog)	Angelenos to voice concerns on Metro Projects at open House Meetings	3/19/2019
3. Los Angeles Daily News	Orange Line project could shorten bus commute by 30 percent, Valley motorists might be delayed, says Metro	3/26/2019
4. Urbanize Los Angeles	A look at the \$361-Million Plan to Speed Up the Orange Line	3/28/2019
5. CurbedLA	Metro prepares to upgrade the Valley's popular Orange Line bus route	4/2/2019



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4. Community Meetings

The community meetings were held on Tuesday, March 26 and Wednesday, March 27, 2019 as shown below. The purpose of the meetings was to present new information, including updates on the pilot gate, grade separations, and traffic analysis.

Table 4-6 Community Meetings

Meeting	Date	Location/Address
Public Meeting #1 Canoga Park	Tuesday March 26, 2019	Rose Goldwater Community Center Westfield Topanga 21710 Vanowen St Canoga Park, CA 91303
Public Meeting #2 Wednesday North Hollywood March 27, 2019		North Hollywood Senior Center 5301 Tujunga Av North Hollywood, CA 91601

4.1 Format

The meetings offered both an open house and formal presentation (**Appendix D**). The open house format occurred during the first 30 minutes of each meeting, followed by a formal presentation and Q&A session, after which the open house resumed for the last 30 minutes of the meeting. The open house format allowed participants the opportunity to view project exhibits, engage with project representatives, and submit written comments (**Appendix H**). The meetings featured project materials in English and Spanish with support from Spanish interpreters and Spanish-speaking staff.

The first meeting (Canoga Park on March 26) was held early in the morning with a goal of drawing attendees who might not attend an evening meeting, including business owners and business community representatives as well as older individuals who prefer to avoid nighttime driving. The early start time, while experimental, was successful in attracting these audiences. Councilmember Blumenfield also chose to attend the morning meeting to connect with constituents and share his thoughts on the project, and his office staffed an information table throughout the open house. The second meeting (North Hollywood on March 27) was planned with an earlier than typical meeting start time in order to offer local residents, commuters, and Neighborhood Council representatives/attendees a convenient start time to coincide with other activities. Several North Hollywood meeting attendees took copies of project materials for distribution at their respective community and neighborhood meetings scheduled for later that evening or later in the week.

4.3 Public Comments

Meeting participants had an opportunity to submit comments via a variety of methods:

- 1. Questions during the meetings
- 2. Written comments at the meetings
- 3. Post-it notes on rollout maps
- 4. Website via an online comment form
- 5. Mail
- 6. Email
- 7. Project helpline



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4.4 Spanish Interpreters

Two Spanish interpreters were available at each community meeting and additional Spanish-speaking staff was present to provide additional interpretation support. The PowerPoint presentation was translated into Spanish and made available upon request. In addition, the meeting notices included Metro's standard 72-hour advance notice for requesting any language and other special accommodations.

4.5 Information Stations

At the community meetings, boards (Appendix F) were displayed around the room. In addition, the meetings featured interactive screens in order to provide engaging, transparent content for diverse audiences. These screens allowed attendees to focus in on their neighborhoods to better understand specific traffic and noise impacts in their neighborhood and have their specific questions answered by the technical team. In addition, one screen featured a video of the gates operating elsewhere in the Metro rail system for attendees who may not be familiar with this technology. This video ran on a loop during the open houses. The use of the interactive screens enhanced Metro's efforts to be open and transparent about the impacts of the gates on the community.

Attendees were encouraged to visit each station at their leisure before and after the formal presentation and Q&A session. For ease of navigating the stations in an order that made most sense, "footprint" markers were affixed to the ground to direct the flow of suggested movement at the meetings. The information stations were fully staffed throughout the entire open house session and during the formal presentation. These stations provided a platform for participants to interact with the project team to have their questions answered and to provide information that was catered to their level of interest.

During the open house session, questions and responses were handled individually by project team members and attendees were encouraged to submit comments in writing. Metro continues to accept comments using the project communication methods via the website, email, helpline, and direct mail.

Table 4-1 provides an overview of the information stations that were on display at the Open House meetings. Meeting materials are available on Metro's website via Metro.net/orangeline. The meeting materials including the displays at information stations were developed in coordination with the technical team and approved by Metro.



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Table 4-1 Community Open House Meeting Information Stations

Station Topic	Boards	Additional Information
Welcome/Registration		
Project Overview	Measure M Map Project Overview	
	Benefits	
Interactive Station		Touch-screen with layers
		including traffic, noise, etc.
Safety	Renderings of MOL gates	Screen with video of
		rail gates in action
Grade Separations	Sepulveda grade separation;	
	information about Van Nuys grade	
	separation and bike path	
Vehicle Technology	Zero-emission bus technology	
Joint Development near MOL	Information boards	
stations (NoHo Meeting)		
Comment Station	Roll out maps	
Refreshments		
Noho-Pasadena BRT Project		
(NoHo Meeting)		
CD3 Table (Canoga Park Meeting)		

4.6 Additional Features and Resources

Registration/Handouts – Upon arrival, attendees were asked to sign in and as part of the registration process, received a bilingual (English/Spanish) question card (**Appendix G.1**), comment card (**Appendix H.1**) and project fact sheet. Project staff greeted guests and provided an overview of the meeting format and how to submit comments.

Public Comment Tables – English and Spanish comment cards, comment card collection boxes and pens were placed on tables at strategic locations in the meeting room. Staff encouraged meeting participants to submit written or electronic comments. In addition, there were large-scale rollout maps set up on tables in the middle of each meeting room with post-it notes for attendees to write their comments. These tables were staffed by project team members, who engaged in discussion with stakeholders. See section 4.10 for a summary of comments made at the rollout maps.

4.8 Summary of Public Participation

Table 4-2 below provides a detailed summary of Community Open House participation and number of comment cards (Appendix H) submitted by meeting attendees. The section includes a summary of the open house meeting with a summary of key questions and comments received during the meetings. It is important to note that while the attendance at the Canoga Park meeting was smaller compared to the North Hollywood meeting, many of the Canoga Park meeting attendees were highly engaged with many questions and comments share during conversations at the meeting stations.



Table 4-2 Community Open House Meetings Summary

Meeting	Sign-Ins	Comment Cards Submitted
Canoga Park Community Meeting	14	3
North Hollywood Community Meeting	39	9
Total	53	12

Table 4-3 Community Open House Meeting Key Stakeholders

Canaga Park Community Open House Meeting		
Canoga Park Community Open House Meeting		
Tuesday, March 26, 2019		
Stakeholder Groups	Key Engagement/Participants	
B. attata and	Question Cards Submitted: 2	
Participants	Comment Cards Submitted: 3	
Elected Office	Councilmember Bob Blumenfield (provided welcoming remarks and staff)	
	hosted a table at the meeting)	
Neighborhood		
Councils	Mary Paterson, Canoga Park Neighborhood Council	
Agencies	Monroe Jones, North Los Angeles County Regional Center	
	Armando Flores, Valley Industry & Commerce Association	
	Julia Wean, Warner Connects	
Other Stakeholder	Kathy Delle Donne, Tarzana Improvement Association	
Organizations	Katherine Thomas, West Valley Warner Center Chamber of Commerce	
	Greg Jackson, Warner Center Association	
	Brian Silk, Pierce College	
	,	

North Hollywood Community Open House Meeting Wednesday, March 27, 2019		
Stakeholder Groups	Key Engagement/Participants	
Participants	Question Cards Submitted: 10Comment Cards Submitted: 9	
Elected Officials	 Yvonne Perez, Office of Councilmember Nury Martinez, District 6 Doug Mensman, Office of Councilmember Paul Krekorian, District 2 Jessica Orellana, Office of County Supervisor Sheila Kuehl, District 3 Hannah Kelley, Office of State Senator Robert Hertzberg, District 18 	
Neighborhood Councils	 Barry Johnson, Studio City Neighborhood Council Max Flehinger, Tarzana Neighborhood Council Glenn Bailey, Encino Neighborhood Council Bob Peppermiller, North Hollywood Neighborhood Council Suzanne Lewis, Valley Village Neighborhood Council Alice Hart, Valley Village Neighborhood Council 	
Agencies	 John Casselberry, City of Simi Valley Jordan Fraade, City of Los Angeles 	
Other Stakeholder Organizations	Zachary Rynew, Los Angeles County Bicycle Coalition	

At both meetings, participants were offered the opportunity to submit questions for response following the presentation. A total of **12 question cards** collectively were submitted. Below is a brief summary of the major topics that were expressed during the question and answer portion of the presentation (not comprehensive; intended as a high-level snapshot):

Noise

o Gate bells are extremely loud. What can be done to mitigate?

Traffic

o A gate will cause more car congestion at intersections.

Railroad Type Gates

O During rush hour do you know how long the gates will be down?

• Bus Connectivity

o Improve transit bus connections to Orange Line stations.

Rideshare

Designate specific area at stations for rideshare pickups/drop offs.

Operations

 Electronic signage at stations to help navigate around and with bus connection information.



DRAFT: 06/05/2019 12 | Page

Using the Metro system can be challenging.

Safety

- Recommend buses are equipped with intercom system in case of emergency to help improve safety.
- Would like to see extra security at stations.

4.9 Summary of Community Meeting Comments

Table 4-4 is a summary of the comments received (Appendix G & Appendix H) during the community meetings. Concerns were safety on buses and at stations, homeless issues, increasing ridership capacity, bike and pedestrian improvements, and first and last mile connections.





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Table 4-4 Comment/Question Summaries

COMMUNITY OPEN HOUSE MEETINGS COMMENTS		
Category	Comment/Question Summaries	No. of Comments
General	What is meant by a CEQA exemption?	1
Operations	 (Provide) electronic signage at stations with information about bus connections Improvements to navigating Metro system Will the gates have noise as well as light signals? Will power lines along Sepulveda be raised when the bridge is built? 	4
Railroad Type Gates	 During rush hour, how long the gates will be down? Are you removing a lane of traffic for the gate medians? 	2
Active Transportation	 Is there any way to improve signage on the bike path so it's clearer to people walking to stay on the pedestrian side? 	1
Grade Separations	It would be best to have the entire busway be separated from the street, either elevated or below grade, but not at grade	1
Parking	 Are you going to look at increased parking at stations? Will management be aware of increased parking needs and be willing to reduce the space currently allocated to Keyes Motors at the Sepulveda Station? 	1
Rideshare	 Designate an Uber/Lyft pickup and drop off point at each station 	1
Signal Priority	How do we work with the city to get green light for buses?	1
Traffic	A gate will increase traffic congestion	1
Bus Connectivity	Improve transit bus connections to Orange Line stations	1
Safety	 Recommend buses are equipped with intercom system in case of emergency to help improve safety Will elevators have cameras? Would like to see extra security at stations 	3



4.10 Summary of Map Comments

Table 4-5 is a summary of the comments provided on the roll-out maps, organized by station location.

Table 4-5 Map Comments

Station/Location	Comments
Chatsworth Station	No restroom
Sherman Way Station	 Need a stop at Saticoy St (Either alignment) Orange Line 601 Line
Conora Station	*There are schools, businesses and housing
Canoga Station	Add restrooms at Canoga StationNo restrooms
Pierce College Station	Bridge over Victory BI needed (East of Pierce)
Reseda Station	 Elevate Reseda Station Add restrooms at the Reseda Station Bridge needed over Reseda Bl
White Oak	Need a stop at White Oak. There are parks, shopping and freeway service
Balboa Station	 Elevate Balboa Station Need better access to Lake Balboa Park from Balboa Station Bridge needed over Balboa Station
Balboa/Woodley	Make a pedestrian crossing light between Balboa Av and Woodley to default to green for Orange Line
Havenhurst/Orange Line	Make light at Hayvenhurst default to green for the Orange Line
Sepulveda Station	 Sepulveda Station parking lot needs to be redeveloped with new housing, streets, retail, office buildings and a park Sepulveda pass monorail would be elevated along Sepulveda Bl down center median Monorail station would have to be built over Sepulveda Station/Orange Line bridge Consider Monorail station at Sepulveda and Burbank Bl Consider Sepulveda Monorail station at Sepulveda and Vanowen St. There is housing, shopping, and restaurants
Van Nuys Station	 Where in this area will Van Nuys BI (ESFV) light rail terminate? Make sure MOL-light rail transfer is as easy and seamless as possible. Maybe timed transfers? Restrooms needed at Van Nuys Station

Station/Location	Comments
Woodman Station	 Please improve connecting transit bus service to the Orange Line Please improve frequency of connecting service to the stations. We need better headway and more than once an hour March 27, 2019 bus driver had to continuously honk at Woodman station because car would not yield to the bus the right-of-way Please have electronic signs at Orange Line station indicating when the connecting transit buses will arrive at the station Bridge needed over Woodman Av and Oxnard St Elevate Woodman Station
Valley College Station	Bridge over Burbank and Fulton neededElevate Valley College Station
Coldwater Canyon	 There should be a stop at Coldwater Cyn Where line crosses Chandler: Concern about noise from gates Likes current signal controls Intersection at Chandler 13001 Chandler No accidents - never even a single accident since the line opened. This crossing intersection has been the safest Cars need to be fined \$5,000 for using the Orange Line as a road. I've seen cars multiple times at or near Leghorn Av
Whitsett Av	 Concern regarding bell noise at Chandler and Whitsett Residential area Right turn violations not an issue
Laurel Canyon Station	 Switch the pedestrian crossing light at Agnes Av to default to green for the Orange Line, instead of flashing red Consider high density development around Laurel Cyn Station Bridge needed over Laurel Canyon Bl Elevate Laurel Canyon Station
North Hollywood Station	 Prioritize obtaining signal preemption opportunity at the Tujunga Bl crossing. Currently buses just leaving the NoHo station must wait at Tujunga for over three minutes for a green light You need to put an electronic bike locker at the NoHo Station, so all can use them Metro customer information center needed at NoHo Station Metro Red Line station entrance needed at the southwest corner of Lankershim and Chandler Consider a Metro Red Line extension to the NoHo West mixed-use development and to Panorama City



4.11 Summary of Comments Submitted Outside of Meetings

In addition to the meetings themselves, stakeholders commented about the project via the project email, on the Metro Source posts related to the meetings and on the Facebook posts that advertised the meetings. A summary of those comments follows below.

Table 4-6 Comments Submitted Outside of Meetings

COMMUNITY OPEN HOUSE MEETINGS COMMENTS		
Category	Comment/Question Summaries	Number of Comments
Cost	 Concerns about costs; some feel it would be better spent to convert to an underground route 	3
Railroad Type Gates	 Concerns about delays from the gates similar to Expo Line 	8
General	 Comments ranging from supportive/positive about service to concerns about cleanliness, homelessness 	37
Conversion to Light Rail	 Support for converting MOL to light rail; frustration about the long timeframe 	5
Operations	Complaints regarding headways and travel times	7
Grade Separations	 Comment regarding how to integrate ESFV with MOL and Sepulveda at Van Nuys 	1
Traffic	 Range of comments including concerns about increased traffic as well as the need for the project 	4
Safety	 Comments regarding safety on-board and at stations; skepticism regarding the need for safety improvements along MOL 	7





Appendix G Question Card

Appendix G.1

Question Card





PUBLIC MEETINGS – March 26, 27, 2019 Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

	40.000.0	
Name/Nombre:		
Affliliation/Afiliación:		
Phone/Numero de teléfor	10:	Email/ <i>Correo</i> <i>Electrónico</i> :
Meeting Date/Fecha de R	eunión:	
Questions/ <i>Preguntas</i> :		
Metro	PUBLIC N Reunione	Orange Line Improvements Project to de Mejoras de la línea Orange Line de Metro MEETINGS – March 26, 27, 2019 és Comunitarias – 26 de marzo y el 27 de marzo de 2019 on Card/ Tarjeta de Preguntas
Name/Nombre:		
Affliliation/Afiliación:		
Phone/Numero de teléfor	10:	Email <i>/Correo</i> <i>Electrónico</i> :
Meeting Date/Fecha de R	eunión:	
Questions/ <i>Preguntas</i> :		

Appendix G.2

Submitted Question Cards

QA: Secundry on the bus me? pp gerators are haved to help Hy features to Afrer Jams mes 3/27 for green got? In to do Q6: encreased parung needs?



PUBLIC MEETINGS – March 26, 27, 2019 Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

	Name/Nombre:	Stephen Paul Stelmuch 34,
	Affliliation/Afiliación:	
	Phone/Numero de teléfono:	Email/Correo Electrónico:
	Meeting Date/Fecha de Reunión:	
	Questions/Preguntas:	- 1 Para lines al - foult ala crossina
the crange L	ine, Will the payer	ead Power lines along Sepulveda, crossing lines be raised up more when the ar will the power lines be
	undergraunded at	the Sepulveda station bridge?
1.	will Reseda sto be elevated as	ation and Valley College station a bridge?



PUBLIC MEETINGS – March 26, 27, 2019 Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

Name/Nombre:	NATE ZABLEN
Affliliation/Afiliación:	SO-CA TRANSIT ADVOLATES
Phone/Numero de teléfono:	Email/Correo Electrónico: MZalo 48 @ yahoo.com
Meeting Date/Fecha de Reunión:	3/27
Questions/Preguntas:	
(1)What is METRO do	ing to improve transit commectivity to
the Orange Line St	attons: Some of the stations are served
by connecting fra	
are not servey at	all after Tpm. (Such as Wood man)
2) - Have elect	ronic signage at Orange Line Stateons
that will judic	The when the connecting transit lines
will arrive at	the Drange Hne stations.



PUBLIC MEETINGS – March 26, 27, 2019
Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

Name/Nombre: Andlew Wan
Affiliation/Afiliación: Los Angeles County Bicycle Coalitton
Phone/Numero de teléfono: (310)344-6113 Email/Correo Electrónico: MARWANGO LEYANO CO
Meeting Date/Fecha de Reunión: March 27, 2019
A would be best to have the entire pushing be separated from the street either elevated or below grade, but not at grade



PUBLIC MEETINGS – March 26, 27, 2019 Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

Name/Nombre:	1503 R18TH
Affliliation/Afiliación:	
Phone/Numero de teléfono:	Email/Correo Electrónico:
Meeting Date/Fecha de Reunión:	
Questions/Preguntas:	rush hours, how long will the
gates, on average	
How often	n and for how long will ears
be "blocked " fr	on the intersection?



PUBLIC MEETINGS – March 26, 27, 2019 Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

Name/Nombre:	Rosemary Campbell
Affliliation/Afiliación:	
Phone/Numero de teléfono:	Email/Correo Electrónico:
Meeting Date/Fecha de Reunión:	
Questions/Preguntas: Will management parking needs The space cu	and be willing to reduce rrently allocated to Keyes
Moter's at S	iepulveda Station — and similar



PUBLIC MEETINGS – March 26, 27, 2019
Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

Name/Nombre:	Ezeaulel Coelho
Affliliation/Afiliación:	NEWE
Phone/Numero de teléfono:	Email/Correo WWNSVX@gMalL.CO.
Meeting Date/Fecha de Reunión:	3-27-2019
Questions/Preguntas: 19there any wa	y to improve an signage on the
Bike path so, its che	earen to people walking to stay
ON the pedestrio	IN SIDE,
,	



PUBLIC MEETINGS – March 26, 27, 2019 Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

Name/Nombre:	Andrew Ward
Affliliation/Afiliación:	Los Propeles Court Bicycle Coalition
Phone/Numero de teléfono:	Email/Correo Electrónico:
Meeting Date/Fecha de Reunión:	March 27, 2019
Questions/Preguntas: Will He bells Of the gate	begin ringing prior to the limit's



PUBLIC MEETINGS – March 26, 27, 2019 Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

Name/Nombre:	Lec Jamieson
Affliliation/Afiliación:	GLTMC
Phone/Numero de teléfono:	763 9074 Email/Correo Electrónico:
Meeting Date/Fecha de Reunión:	
Questions/Preguntas: W/LC WE HAVE W/LL ELAVATERS HAY THAT URMAT	DASH HAVE CAMRAS AGD POST POPLE IN ELAVATERS SO IT WILL STOP



PUBLIC MEETINGS – March 26, 27, 2019
Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

	Name/Nombre:	Faramare Nabari
	Affliliation/Afiliación:	the state of the s
	Phone/Numero de teléfono:	Email/Correo Electrónico:
	Meeting Date/Fecha de Reunión:	March 27, 2019
	Questions/Preguntas:	
),	Hon quickly can Metos get	+ CADOT to reset the pedestrian crassings of Agnes
	Ave (Carrel Canyon Station) as	nd between Balbaca & Woodley to default to green
	for the Orange Line so be	uses don't have to stop there? Also, some for the
	intersection at Hayrenhurs	t, which is mornally gated closed any way.
2.	Is Metro stodying cascading s	ignals instead of crossing gates that would trippered as
2	the bus moves so we can m	aintain frequency?
5,	Is Motos considering both the	Amplement My both the street & freeway concepts for the Notes
	Pasadona BRT? They serve to	no different types of this.



PUBLIC MEETINGS – March 26, 27, 2019 Reunionés Comunitarias – 26 de marzo y el 27 de marzo de 2019

Name/Nombre:	12552 KayE
Affliliation/Afiliación:	
Phone/Numero de teléfono:	Email/Correo Electrónico: d/Kayefa juno com
Meeting Date/Fecha de Reunión:	3/27/19
Questions/Preguntas:	
D What is MEN	nt by "CEDA Exemption" in
July 2018	on the timeline; what
DATE YOU TEM	oring a lang of traffic for the
93/3 ms/12	2K5 3
3 6191 the gat	ES have audio as well as light signals?
9	0 0



Appendix H Comment Card

Appendix H.1

Comment Cards

Appendix H.2

Submitted Comment Cards

Appendix H.3

Roll Out Map With Comments





Affiliation (i.e. organization, resident, business)/ Afilicacion (es décir, organizacion, residente, negocio):			
Address/Domicilio:			
Phone/Numero de telefono:			
Email/Correo electronico: Please circle meeting what meeting you are attending/ Por favor, marque la reunión a la que asiste:	Tuesday, March 26, 2019 Martes, 26 de marzo de 2019	Wednesday, March 27, 2019 Miércoles, 27 de marzo de 2019	
Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. <i>Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.</i>			





888.316.3889



orangeline@metro.net



Fold Here

Place Stamp Here

Fulgene Asuncion Metro One Gateway Plaza, Mail Stop 99-22-4 Los Angeles, CA 90012

Appendix H.2

Submitted Comment Cards



Comn	nent Card /Tarjeta de Comentarios
Name/Nombre:	Laurie Lake (818) 439-8085
Affiliation (i.e. organization, resident, business)/ Afilicacion (es décir, organizacion, residente, negocio):	Resident concerned
Address/Domicilio:	mom of high School
Phone/Numero de telefono:	student - rides
Email/Correo electronico: Please circle meeting what meeting you are attending/ Por favor, marque la reunión a la	Tuesday, March 26, 2019 Wednesday, March 27, 2019 Cane Sz
que asiste:	Martes, 26 de marzo de 2019 Miércoles, 27 de marzo de 2019
I recommon	rend early love be
I recomm	
Equipped	with an intercom
System s	similar to metro
trains.	
Again, MANY	LAUSD students ride
The Orange Ci	no. It is a great form of fransportation
metro.net/orangeline 888.316.3889	
In addition, orangeline@	comments can be submitted by mailing this self-addressed form, emailing at Suffer Ometro.net or calling the project helpline at 888.316.3889. Además, los





Name/Nombre:	Lourie Lake
Affiliation (i.e. organization, resident, business)/ Afilicacion (es décir, organizacion, residente, negocio):	Parent of LAUSD student Hollywood HS He
Address/Domicilio:	5100 Don Pio Drive
Phone/Numero de telefono:	(818)439-8085
Email/Correo electronico:	PAPGAL @ AOL. COM
Please circle meeting what meeting you are attending/ Por favor, marque la reunión a la que asiste:	Tuesday, March 26, 2019 Martes, 26 de marzo de 2019 Wednesday, March 27, 2019 Miércoles, 27 de marzo de 2019
Thank you for your interest in the Metro Orang interés en el Proyecto de Mejoras de la Orange	ge Line Improvements Project. We welcome your comments. Gracias por su Line de Metro. Sus comentarios son bienvenidos.
The metro are	is confusing, hard to
navigate. I	was informed this was a
	problems that occur on the OL
is my son does	
numerous inciden	to of drugged out people,
one person wie	eding a Knife at another
person, people not much sewr	getting on without paying,
Suggestion - L	uning not put signs on
metro.net/orangeline 888.316.3889	9 orangeline@metro.net
In addition,	comments can be submitted by mailing this self-addressed form, emailing at



Metro Orange Line Improvement Project Prior Engineering and Development Faults

March 26, 2019

 Traffic Signal Timing favors North-South traffic on Canoga Ave. This timing is woefully to the disadvantage to all east-west traffic along the following Street Intersections in the West Valley:

> Vanowen St Sherman Way Saticoy St Roscoe Blvd Parthenia St Nordhoff St

At Each of these intersections, there are about 20 to 25 traffic signal lights controlling the Orange Line Private road that parallels Canoga Ave, right and left lane traffic, and through traffic on the East-West and North-South streets. In addition, the north-south pedestrian/bicycle pavements share cycle timing mostly with Canoga Ave.

The overall signal cycle is very long. Although I haven't timed it, the cycle feels like two minutes. And, because the timing favors the north-south traffic on Canoga Ave, there are significant backups of east-west traffic on all of the intersections shown above.

The remainder of intersections south of Vanowen St, are not impacted by the Orange Line and their timing considerations are more appropriately related to local traffic around Warner Center and the 101 Freeway and therefore are not a part of this discussion. Those intersections with Canoga Ave are:

Victory Blvd Irwin St Oxnard Blvd Burbank Blvd.

Serious engineering re-evaluation of traffic signal timing must be done to remove the city engineering-made bottlenecks.

Here are my reasons:

a. Canoga Avenue traffic does not justify the current timing rules because, north of Victory Ave, Canoga Ave is not a through street to the 118 freeway and has less traffic than might otherwise occur. There is a bottleneck where Canoga Ave runs into Marilla Street and the subsequent zig-zag of traffic via of Owensmouth, Lassøn, Devonshire, and other streets does not support speedy travel for commuters travelling long distances via the 101 freeway through the West Valley to and from the 118 freeway. They take Topanga Canyon and DeSoto Streets directly to the 118 freeway on ramps and fuss about it all the time.

b. Furthermore, traffic on Topanga, north of Roscoe Blvd carries additional traffic that south of Roscoe is diffused by alternate pathways, namely Shoup Ave and Fallbrook Ave that could have been alleviated if the city, decades earlier, had proceeded with a proposed widening and re-rerouting the extension of Valley Circle Blvd to connect to Topanga near Chatsworth Street.

Had the original Orange Line traffic design engineers understood the West Valley traffic anomaly, they would not have designed the signal timing to be so disadvantageous to east-west traffic on the West Valley's busiest streets.

- c. At certain times of the day, and not necessarily during "rush hour", stopped traffic on the east-west streets noted above can back up more than a ¼ mile in each direction from the intersections in question, causing drivers to wait through two and three cycles of the traffic signals. The multiple minutes waiting time, for so many gasoline powered vehicles, is unnecessary air pollution.
- d. Bus traffic north and south along the Orange line road is so infrequent, like ten minute intervals, that there does not seem to be any reason that bus traffic could be a factor in signal timing. And, certainly adding railroad crossing signals to manage that traffic is even less practical. That idea should be discarded.
- e. There are times when I sit at the red light on Nordhoff, and on Parthenia Streets and wait for 30 seconds or more waiting for the light to go green while observing only one or two north-south vehicles pass by that is a constant reminder of how dismal the situation is.

Written by longtime resident:

Robert Bladow 8420 Sale Ave West Hills. March 25, 2019



Name/Nombre:	NATE ZABLEN
Affiliation (i.e. organization, resident, business)/ Afilicacion (es décir, organizacion, residente, negocio):	SOCA TRANSIT Advocates
Address/Domicilio:	
Phone/Numero de telefono:	
Email/Correo electronico:	nzab 48@ yahoo, com
Please circle meeting what meeting you are attending/ Por favor, marque la reunión a la que asiste:	Tuesday, March 26, 2019 Martes, 26 de marzo de 2019 Wédnesday, March 27, 2019 Miércoles, 27 de marzo de 2019

Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.

	1. Improve transit bus connectivity to the Drange have Stutions
	Currently Metro puses serve the Woodman and Tampa
	Stations only once appour. at some stations where is
	no connecting transit service after 7:30pm.
	2 Have electhorise dicital signage at the
	Drance line Stations whech would indicate when
	the connecting lowers will arrive to take you from the station. 3) Obtain from the City (LADOT) segnal priority or premiphor for the Orange here buses crossing tajunca Currenty the buses must wait around three minutes for metro.net/orangeline (1) 888.316.3889 orangeline@metro.net the light to chang.
/	3) Optain from the City (LADOT) segnal priority or
	promotion to the crance have buses crossing Tajunça
	Currenty the buses must wait around three minutes for
	metro.net/orangeline 888.316.3889 orangeline@metro.net The (15ht to change.



continued 7 the buses Bx: If you see suspicions activity or feel unsafe, please text (bus number of the exact bus) to "a help" 911? This way people can quilly report issues Signs should be in Engush & spanish and easy to read [hand for Fold Here

> Place Stamp Here

Fulgene Asuncion

Metro
One Gateway Plaza, Mail Stop 99-22-4
Los Angeles, CA 90012



Name/Nombre:	Mary Gorco
Affiliation (i.e. organization, resident, business)/ Afilicacion (es décir, organizacion, residente, negocio):	Part mentor of 20 gra NOHONC
Address/Domicilio:	15/23 Cohwenga Bud, NoHo 91601
Phone/Numero de telefono:	818 5544582
Email/Correo electronico:	MG 9/601@ Gmails Com
Please circle meeting what meeting you are attending/ Por favor, marque la reunión a la que asiste:	Tuesday, March 26, 2019 Wednesday, March 27, 2019 Martes, 26 de marzo de 2019 Miércoles, 27 de marzo de 2019
Thank you for your interest in the Metro Ora interés en el Proyecto de Mejoras de la Orange Grand Gran	ange Line Improvements Project. We welcome your comments. Gracias por su ge Line de Metro. Sus comentarios son bienvenidos.





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Metro Orange Line Improvements Project

Proyecto de Mejoras de la Orange Line de Metro Comment Card,/Tarjeta de Comentarios

Name/Nombre:	Andrew Wary
Affiliation (i.e. organization, resident, business)/ Afilicacion (es décir, organizacion, residente, negocio):	Los Angeles County Bicycle Conlition
Address/Domicilio:	
Phone/Numero de telefono:	
Email/Correo electronico: Please circle meeting what meeting you are attending/ Por favor, marque la reunión a la que asiste:	Tuesday, March 26, 2019 Wednesday, March 27, 2019 Martes, 26 de marzo de 2019 Miércoles, 27 de marzo de 2019
I Hink that there s	ge Line Improvements Project. We welcome your comments. Gracias por su e Line de Metro. Sus comentarios son bienvenidos. Should be a Specific alca for free vail stations adjacents regarde d vide lot is presept.
metro.net/orangeline 888.316.388	89 orangeline@metro.net





	Kon Ald K	11/00/9
Name/Nombre:	- 1 0000	
Affiliation (i.e. organization, resident, business)/ Afilicacion (es décir, organizacion, residente, negocio):		
Address/Domicilio:		
Phone/Numero de telefono:		
Email/Correo electronico:	RONALOTHEBORO GMATIL. COM	
Please circle meeting what meeting you are attending/ Por favor, marque la reunión a la que asiste:	Tuesday, March 26, 2019 Martes, 26 de marzo de 2019	Wednesday, March 27, 2019 Miércoles, 27 de marzo de 2019
Thank you for your interest in the Metro Oran interés en el Proyecto de Mejoras de la Orang	e Line de Metro. Sus comentario	3 3011 Dictive maosi
Need to Place	MORE "Actual Ne	of the Stairs And cloud to should rugh on Not-
most ideal Places,	like At the top	of the Stairs AND elevation
parteraced so over	kenow if they s	should rugh or Not-
Ell is the of the co		
metro.net/orangeline 888.316.38	89 orangeline@metro.ne	





Name/Nombre:

Affiliation (i.e. organization, resident, business)/ Afilicacion (es décir, organizacion, residente, negocio):

D THIS INTERSECTION CROSSES A DNE-WAY CAR TRAFFIC ONLY NOT A TWO-WAY. Q THERE IS NO RIGHT TURN ON THIS INTERSECTION THAT CAUSED ACCIDENTS IN OTHER INTERSECTIONS!

Address/Domicilio:

Phone/Numero de telefono:

Email/Correo electronico:

Please circle meeting what meeting you are attending/ Por favor, marque la reunión a la que asiste:

13001 CHANDLER BLUB, SHERMAN BAKS, CA 91401

(818) 267-6706

amnone @ yahoo.com

Tuesday, March 26, 2019 Martes, 26 de marzo de 2019 Wednesday, March 27, 2019 Miércoles, 27 de marzo de 2019

THIS INTERSECTION IS BETWEEN COLDWATER CANYON & ETHEL AVE, RIGHT ON CHANDLER BLVD.

Thank you for your interest in the Metro Orange Line Improvements Project. We welcome your comments. Gracias por su interés en el Proyecto de Mejoras de la Orange Line de Metro. Sus comentarios son bienvenidos.

INSTALLING A GATE AT THE INTERSECTION WHERETHE RUS CROSSES CHANDLER RIVE (AT 1300] CHANDLER LOCATION)
IS TOTALLY UNNECESSARY. FIRST, SINCE THE LINE BEGAN OPERATING IN 2005 THERE HIS NEVER BEEN CHESINELS ACCIDENT
AT THIS INTERSECTION. THE FLUSHING "BUS" SIGN IS CLERLY SEEN FROM FAR AWAY FROM THIS INTERSETION AND CAR
TRAFFIC STOPS FOR THE BUS. INSTEAD OF A GATE, INCREASE THE TIME OF FLUSHING OF THIS "BUS" SIGN SO CARS WILL
SEE IT EARLIER. THE SECONDLY, THE GATE RELLS ARE EXTREMELY LOUD AND THEY WILL CAUSE EXTREME
DISTURBANCE TO THE RESIDENTS WHO LIVE AROUND THIS INTERSECTION. THIRDLY, A GATE WILL FURTHER SLOW
DOWN CAR TRAFFIC AND INCREASE FURTHER THE AUTOMORILE TRAFFIC CONGESTION WHICH IS EXTREMELY
HEAVY AS IT IS, FOURTHLY, INCREASED RIBERSHIP WILL DOUBLE THE NUMBER OF BUSES. FIFTHLY, THERE IS ONLY
ONE WAY CAR TRAFFIC AND NO RIGHT TURNS IN THIS INTERSECTION!



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Comm	nent Card /Tarjeta de Come	entarios
Name/Nombre:	Le	TAMIESON
Affiliation (i.e. organization, resident, business)/ Afilicacion (es décir, organizacion, residente, negocio): Address/Domicilio: Phone/Numero de telefono: Email/Correo electronico: Please circle meeting what meeting you are attending/ Por favor, marque la reunión a la que asiste:	5345 31 763 967 Tuesday, March 26, 2019 Martes, 26 de marzo de 2019	Wednesday, March 27, 2019 Miércoles, 27 de marzo de 2019
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888.316.3889



orangeline@metro.net





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to the orange	cine. I'm in strong support of
this project and	
anade reparations	in the future.
- J	





Metro Orange Line Improvements Project Proyecto de Mejoras de la Orange Line de Metro Comment Card /Tarieta de Comentarios

Comm	nent Card / Tarjeta de Comentarios
Name/Nombre: Affiliation (i.e. organization, resident,	Svaar dimon.
business)/ Afilicacion (es décir, organizacion, residente, negocio):	WOUTHOOUN ST MOSE Solle CON
Address/Domicilio:	(218 255 06 M)
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Email/Correo electronico: Please circle meeting what meeting you are attending/ Por favor, marque la reunión a la que asiste:	Tuesday, March 26, 2019 Wednesday, March 27, 2019 Martes, 26 de marzo de 2019 Miércoles, 27 de marzo de 2019
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metro.net/orangeline 888.316.38	89 orangeline@metro.net



In addition, comments can be submitted by mailing this self-addressed form, emailing at orangeline@metro.net or calling the project helpline at 888.316.3889. Además, los comentarios pueden ser entregados enviando este formulario por correo, enviando un correo electrónico a orangeline@metro.net o llamando a la línea de ayuda del proyecto al 888.316.3889.



Los Angeles County Public Works 900 S. Fremont Ave. Alhambra, CA 91803 October 29, 2020

RE: Safe, Clean Drinking Water Program FY 21-22 – Metro Orange Line Water Infiltration and Quality Project

To Whom it May Concern:

I am writing on behalf of the Natural Resources Defense Council in support of the Los Angeles County Metropolitan Transportation Authority (LA Metro) and Los Angeles Department of Water and Power's Metro Orange Line (MOL) proposal for the Safe, Clean Water Program.

The MOL Water Infiltration and Quality Project (Project) proposes to implement 168 drywells across seven locations along the MOL with pretreatment facilities to capture, treat, and infiltrate stormwater runoff from 2,300 acres, resulting in an estimated groundwater recharge yield between 780 and 1,050 acre-feet/year into the San Fernando Groundwater Basin. This project, situated within some of the highest value groundwater recharge areas within the region, would allow for large-scale infiltration and aquifer recharge, and has the potential to capture enough stormwater to allow Metro to become net water positive.

Thank you for your consideration of my support. Should you have any questions regarding my support, you may contact me at cbell@nrdc.org.

Sincerely,

Corinne Bell



ATTACHMENTS FOR SECTION 7.1:

COST & SCHEDULE



ATTACHMENTS FOR SECTION 7.2:

COST SHARE



Board of Commissioners
Cynthia McClain-Hill, President
Susana Reyes, Vice President
Jill Banks Barad
Nicole Neeman Brady
Susan A. Rodriguez, Secretary

Martin L. Adams, General Manager and Chief Engineer

October 15, 2020

Los Angeles County Metropolitan Transportation Authority Craig Reiter One Gateway Plaza Mail Stop 99-16-9 Los Angeles, California 90012-2952

Subject: Letter of Support for METRO Orange Line Water Infiltration and Water Quality Project

Los Angeles Department of Water and Power (LADWP) is pleased to express support for the METRO Orange Line (MOL) Water Infiltration and Water Quality Project (Project) for consideration to the Safe Clean Water Program (SCWP) Call for Projects Round two.

LADWP strongly supports multi-benefit opportunities and partnerships in projects that help achieve increases in stormwater capture, groundwater recharge, water quality, and community improvements. The Project will provide fast and reliable ridership to disadvantage communities, enhance pedestrian safety, provide significant water quality and water supply benefits, as well as support the transition to electric bus operations at the MOL. This Project will assist LADWP in achieving its long-term local supply strategies and sustainability, through augmenting local groundwater supply in the San Fernando Groundwater Basin and improving the water quality in the Los Angeles River downstream. In addition, this Project aligns with the critical needs and priorities established within the SCWP guidelines and further contributes to the development of disadvantaged communities.

LADWP intends to be a funding partner with METRO for the implementation of the Project, once it is successful in receiving SCWP Round two funding. LADWP intends to provide up to \$11,088,000 for the installation of 168 drywells (\$66,000 per drywell) pending LADWP Board of Commissioners' approval. Additionally, LADWP understands METRO will be responsible for operations and maintenance of the aforementioned drywells, through their viable Project life.

Mr. Craig Reiter Page 2 October 15, 2020

As a local advocate for stormwater capture projects that provide multiple benefits and long-term sustainability, LADWP strongly supports this Project and recommends that the SCWP award funding for the Project. LADWP appreciates your consideration.

If you have any questions about this letter of support, please contact Mr. Art Castro, Manager of Watershed Management, at (213) 367-2966.

Sincerely,

David R. Pettijohn

Director of Water Resources

AC:lb/cyr

c: Art Castro

Delon Kwan



ATTACHMENTS FOR SECTION 8.1:

ENVIRONMENTAL DOCUMENTS AND PERMITS





engineers | scientists | innovators

CEQA Environmental Checklist Form

Metro Orange Line Water Infiltration and Quality Project

1. EVALUATION OF ENVIRONMENTAL IMPACTS

The following checklist is adapted from the California Environmental Quality Act (CEQA) Statute & Guidelines Environmental Checklist Form (Appendix G). The checklist may be used to meet the requirements of an initial study when the criteria set forth in CEQA Guidelines have been met. A discussion follows each environmental issue identified in the checklist.

Supporting documentation of the expected CEQA permitting process for the Project is included in Appendix A.

In this review, the following designations are used:

- **Potentially Significant Impact:** An impact that could be significant, and for which no mitigation has been identified. If any potentially significant impacts are identified, an Environmental Impact Report (EIR) must be prepared.
- **Less-Than-Significant With Mitigation Incorporated:** An impact that requires mitigation to reduce the impact to a less-than significant level.
- **Less-Than-Significant Impact:** Any impact that would not be considered significant under CEQA based on the appropriate and applicable criteria and standards.

No Impact: The project would not have any impact.

Environmental Impact Review 1 October 2020

1.1 Aesthetics

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I.	AESTHETICS – Would the project:				
a)	Have a substantial adverse effect on a scenic vista?				\boxtimes
b)	Substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				⊠
c)	In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?				
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				\boxtimes

a-d) No impacts to aesthetics are anticipated. The proposed drywell and pretreatment facilities are subsurface.

1.2 Agriculture and Forestry Resources

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact		
II.	resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:						
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?						
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?						
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?						
d)	Result in the loss of forest land or conversion of forest land to non-forest use?				⊠		
e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?						

a-e) No impacts to agriculture and forestry resources are anticipated. The entire project is within an urbanized area.

1.3 Air Quality

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III.	AIR QUALITY – Where available, the signif management or air pollution control district methods the project:				
a)	Conflict with or obstruct implementation of the applicable air quality plan?			\boxtimes	
b)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?				
c)	Expose sensitive receptors to substantial pollutant concentrations?			\boxtimes	
d)	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			\boxtimes	

a-d) The construction of the project could result in temporary emissions that would result in less than significant impacts. Metro's Green Construction Policy will be adhered to, which will limit the construction related emissions. There is a potential for temporary dust generation as a result of construction activities. A dust control plan will be developed, detailing dust control measures and monitoring requirements. SCAQMD Rule 402 will be adhered to. There is no anticipated permanent impact to air quality, and no control measures will be needed after construction is complete.

1.4 Biological Resources

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV.	BIOLOGICAL RESOURCES – Would the p	project:			
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				×
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				\boxtimes
c)	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				⊠
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				⊠
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				

a-f) No impacts to biological resources are anticipated. No existing pervious areas or habitat areas are proposed to be disturbed; construction will take place exclusively in areas that are already fully urbanized.

1.5 Cultural Resources

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V.	CULTURAL RESOURCES – Would the pro-	oject:			
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?				\boxtimes
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?			\boxtimes	
c)	Disturb any human remains, including those interred outside of formal cemeteries?			\boxtimes	

a) There are no historical resources within the project area.

b-c) There is a low likelihood of buried cultural resources within the project area. If such resources are encountered, construction work within the vicinity on the unpatinated discovery will halt. A SOI qualified archaeologist will assess the discovery and provide recommendations on the significance and treatment.

1.6 Energy

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI	. ENERGY - Would the project:				
a)	Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?				
b)	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?				\boxtimes

a) The project would have a less than significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources.

b) The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

1.7 Geology and Soils

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI	I. GEOLOGY AND SOILS – Would the project	et:			
a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
	i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				
	ii) Strong seismic ground shaking?				\boxtimes
	iii) Seismic-related ground failure, including liquefaction?				\boxtimes
	iv) Landslides?				\boxtimes
b)	Result in substantial soil erosion or the loss of topsoil?				\boxtimes
c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			\boxtimes	
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				
f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				\boxtimes

a,b,d,e,f) No impacts to geology and soils are anticipated. All proposed project elements will be constructed in areas that are already entirely paved. No above-ground structures or septic tanks are proposed.

c) According to the Earthquake Zones of Required Investigation Map by the California Geological Survey, the project is located in an area susceptible to liquefaction, The implementation of infiltrating BMPs (i.e., drywells) is not anticipated to increase the liquefaction risk since these BMPs are unlikely to significantly raise the groundwater table or cause groundwater mounding. Refer to the attached geotechnical report for more further discussion of geotechnical impacts.

1.8 Greenhouse Gas Emissions

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	
VI	VIII. GREENHOUSE GAS EMISSIONS – Would the project:					
a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?				\boxtimes	
b)	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				\boxtimes	

a-b) No permanent impacts are anticipated related to greenhouse gas emissions. None of the proposed project components emit greenhouse gases. There is only temporary potential for generation of greenhouse gases during construction.

1.9 Hazards and Hazardous Materials

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX.	HAZARDS AND HAZARDOUS MATERIA	LS – Would the	project:		
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			\boxtimes	
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			\boxtimes	
d)	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				\boxtimes
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				\boxtimes
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				\boxtimes
g)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires?				\boxtimes

a-c) There is currently no known site contamination. A site-specific waste management plan and soil management plan will be developed for the profiling, storage, handling, and disposal of any hazardous materials that may be encountered, which will make the impact less than significant.

e-g) No other impacts related to hazardous materials are anticipated.

1.10 Hydrology and Water Quality

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Χ.	HYDROLOGY AND WATER QUALITY - V	Would the project	:		
a)	Violate any water quality standards or waste discharge requirements?				\boxtimes
b)	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?				\boxtimes
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				×
	i) result in a substantial erosion or siltation on- or off-site;				\boxtimes
	ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;				\boxtimes
	iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or				
	iv) impede or redirect flood flows?				\boxtimes
d)	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?				\boxtimes
e)	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?				\boxtimes

a-e) No impacts to hydrology and water quality are anticipated. The primary purpose of the project is to improve water supply and water quality through treatment and infiltration of stormwater runoff.

1.11 Land Use and Planning

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. LAND USE AND PLANNING – Would the p	roject:			
a) Physically divide an established community?				\boxtimes
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?				\boxtimes

a-b) No impacts to land use and planning are anticipated. The proposed project elements exist entirely within the existing Metro or City right-of-way.

1.12 Mineral Resources

WH. MINISPAL DEGOVE	DOTES W. 11d	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of av mineral resource that v the region and the residual to the residual to the region and the residual to the residual to the region and	ailability of a known would be of value to	ct:			\boxtimes
b) Result in the loss of av important mineral reso delineated on a local g plan, or other land use	ource recovery site eneral plan, specific				\boxtimes

a-b) No impacts to mineral resources are anticipated. The entire proposed project area is within an urbanized area.

1.13 Noise

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI	II. NOISE – Would the project result in:				
a)	Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			\boxtimes	
b)	Generation of excessive groundborne vibration or groundborne noise levels?				\boxtimes
c)	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				

a-c) There is potential for temporary noise impacts during construction. A site-specific noise monitoring and control plan will be developed. There will be no permanent noise impacts resulting from the project.

1.14 Population and Housing

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI	V. POPULATION AND HOUSING – Would t	he project:			
a)	Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				\boxtimes
b)	Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				\boxtimes

a-b) No impacts to population and housing are anticipated. The proposed project elements exist entirely within the existing Metro and City right-of-way.

1.15 Public Services

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI	V. PUBLIC SERVICES				
a)	a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
	i) Fire protection?				\times
	ii) Police protection?				\times
	iii) Schools?				\times
	iv) Parks?				\times
	v) Other public facilities?				\times

i-v) No impacts to public services are anticipated. The proposed project elements exist entirely within the existing Metro and City right-of-way.

1.16 Recreation

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV	7. RECREATION – Would the project:				
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				\boxtimes
b)	Does the project Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				

a-b) No impacts to recreation are anticipated. The proposed project elements exist entirely within the existing Metro and City right-of-way.

1.17 Transportation/Traffic

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV	II. TRANSPORTATION/TRAFFIC – Would	the project:			
a)	Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?				\boxtimes
b)	Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?				\boxtimes
c)	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				\boxtimes
d)	Result in inadequate emergency access?				\boxtimes

a-d) No impacts to transportation/traffic are anticipated. The proposed project elements exist entirely within the existing Metro and City right-of-way.

1.18 Tribal Cultural Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. CULTURAL RESOURCES – Would	the project:			
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or				
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				

a) There are no known tribal cultural resources with the project area.

1.19 Utilities and Service Systems

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. U	TILITIES AND SERVICE SYSTEMS – V	Vould the projec	t:		
dra tel	equire or result in the relocation or instruction of new or expanded water, astewater treatment or storm water ainage, electric power, natural gas, or ecommunications facilities, the instruction or relocation of which could use significant environmental effects?			\boxtimes	
ser fut	ave sufficient water supplies available to rve the project and reasonably foreseeable ture development during normal, dry and altiple dry years?				\boxtimes
tre ser to ade	esult in a determination by the wastewater eatment provider, which serves or may rive the project that it has adequate capacity serve the project's projected demand in dition to the provider's existing mmitments?				
loc of the	enerate solid waste in excess of state or cal standards, or in excess of the capacity local infrastructure, or otherwise impair e attainment of solid waste reduction als?				
ma	omply with federal, state, and local anagement and reduction statutes and gulations related to solid waste?				\boxtimes

a) New storm water drainage facilities will be constructed, and existing facilities expanded. However, no significant environmental effects are anticipated. The infiltrative nature of the proposed project elements will reduce, not expand, the amount of storm water conveyed in existing drainage facilities.

b-e) No other impacts to utilities and service systems are anticipated. The proposed project elements do not produce wastewater or solid waste.

16

1.20 Wildfire

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. WILDFIRE – Would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?				\boxtimes
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?				\boxtimes
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?				\boxtimes
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?				\boxtimes

a-d) The project will not have a significant impact on wildfire.

1.21 Mandatory Findings of Significance

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XX	II. MANDATORY FINDINGS OF SIGNIFICANCE				
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?				
c)	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?				\boxtimes

a-c) No impacts are anticipated. The primary purpose of the proposed project is to improve the quality of the environment through treating and infiltrating stormwater runoff.

APPENDIX ACEQA Permitting Process Overview

Measure W

Orange Line and East San Fernando Valley Transit Corridor Water Infiltration and Quality Project

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LIST OF ATTACHMENTS

Attachment A - Initial Study Checklist

Attachment B - Notice of Exemption Form

Attachment C - Notice of Determination Form

Attachment D - City of Los Angeles CEQA Flow Chart

SOURCES

- CEQA Document Types. (n.d.). California Department of Transportation | Caltrans. https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/ser/fs-ceqa-document-types-a11y.pdf
- CEQA Flow Chart. (n.d.). Los Angeles City
 Planning. https://planning.lacity.org/odocument/e524a6c4-8de9-449a-87e5-b5093d65c4c2/CEQA_flow_chart.pdf
- Environmental Frequently Asked Questions. (n.d.). Sacramento County Planning & Environmental Review. https://planning.saccounty.net/applicants/Pages/FAQ_ER.aspx#Q12

SECTION 1

Introduction

1.1 Scope

MugenKioku Corporation (MugenKioku) was tasked by Geosyntec Consultants (Geosyntec) to provide information regarding the California Environmental Quality Act (CEQA) permitting process for a proposed Los Angeles County Metropolitan Transportation Authority (Metro) feasibility study in consideration for grant approval under Measure W. The study requires the selection of stormwater infiltration drywell sites along with associated stormwater treatment and capture structures for which the CEQA permitting process may apply.

1.2 **Project Location**

The project is currently proposed for seven locations along the Metro Orange Line and five locations along the East San Fernando Valley Transit Corridor.

1.3 Defining a California Environmental Quality Act (CEQA) Project

The purpose of CEQA is to disclose significant environmental effects of a proposed project to the public through either an Initial Study, Negative Declaration, or Environmental Impact Report (EIR). CEQA is intended to enhance public participation in the environmental review process and minimize damage to the environment via mitigation measures and project alternatives.

The California Code of Regulations (CCR), Title 14, Division 6, Chapter 3 contains the guidelines to be followed for CEQA. 14 CCR §15378 considers a "project" to be an action that has the potential to result in direct physical change to the environment or foreseeable indirect change to the environment.

When determining CEQA applicability, the project must first be categorized as discretionary or ministerial. A discretionary project requires deliberation by a public agency (e.g. for approval or permitting). Conversely, a ministerial project only requires conformance with a fixed standard and limited judgement by a public official (e.g. landscaping changes, roof replacements). CEQA applies only to discretionary projects, not to ministerial projects. A project that requires ministerial approval only involves comparison with specific standards for compliance. In summary, the first step in determining the applicability of CEQA to this feasibility study is to distinguish whether the project is discretionary or ministerial.

1.4 Lead Agency/Responsible Agency

The lead agency and the responsible agency (or agencies) must be established for a project that requires CEQA approval .

The lead agency as defined in 14 CCR §15367 is the public agency that has the principal responsibility for carrying out or approving a project under CEQA. The lead agency also decides whether a negative declaration or an EIR is required. For this feasibility study, Metro is the lead agency.

The responsible agencies as defined in 14 CCR §15381 are all public agencies other than the lead agency which have discretionary approval power over the project. These are the agencies for which the lead agency prepared the EIR or negative declaration. For this project, the responsible agencies are the City of Los Angeles and the County of Los Angeles.

SECTION 2 CEQA PROCESS SUMMARY

2.1 Introduction

If the feasibility study is determined to be a discretionary project, the next step in the CEQA process is to determine whether the project qualifies for a statutory or categorical exemption. If neither exemption applies, then an initial study is required, as explained in Section 2.4. below.

2.2 **Statutory Exemption**

Statutory exemptions are defined in 14 CCR §15260-15285. Projects deemed to meet the applicable criteria of a statutory exemption are exempt from CEQA review. Per 14 CCR Section 15262, Feasibility and Planning Studies, "A project involving only feasibility or planning studies for possible future actions which the agency, board, or commission has not approved, adopted, or funded does not require the preparation of an EIR or negative declaration but does require consideration of environmental factors. This section does not apply to the adoption of a plan that will have a legally binding effect on later activities." If a public agency is funding the feasibility study, however, it may not qualify for this exemption. Therefore, the entity funding the feasibility study must be considered when determining exemption applicability.

The City of Los Angeles CEQA Guidelines similarly state, in Article II 2(d), that an exemption can apply for "Feasibility and planning studies for possible future action, although such studies shall include consideration of environmental factors."

The City of Los Angeles has provided a flow diagram of the CEQA process (provided in Attachment D). The steps pertaining to the Statutory Exemption applicability determination and approval process are summarized below:

- 1. Prepare a Notice of Exemption (NOE).
- 2. Determine whether the project is exempt from CEQA.
- 3. Notice of Exemption is filed with the County Clerk.

2.3 Categorical Exemption

Categorical exemptions apply to 33 classes as defined in 14 CCR § 15300-15333. However, there are instances (Classes 3, 4, 5, 6, or 11) where the project may not qualify for the exemption, even though the project fits into one of the categories. These classes will not apply where the project may impact an area of special significance that has been designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.

The flow diagram in Attachment D provides guidance pertaining to the Categorical Exemption determination and approval process, summarized below:

- 1. If an exception applies, prepare an Initial Study to determine appropriate levels of review.
- 2. If an exception does not apply:
 - a. Prepare a Notice of Exemption (NOE).
 - b. Determine whether the project is exempt from CEQA.
 - c. Notice of Exemption is filed with the County Clerk.

2.4 Initial Study

If the project does not qualify for one of the aforementioned exemptions, an initial study is required. The initial study is considered a preliminary analysis of the project and is conducted to assess the potential impact of the project to the environment. Additionally, the initial study provides a summary on if subsequent mitigation measures are needed to reduce environmental impacts. The initial study checklist is included within this report as Attachment A. The following environmental categories are reviewed during the study:

- Aesthetics
- Agriculture and Forestry
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology/Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology/Water Quality
- Land Use/Planning
- Mineral Resources
- Noise
- Population/Housing
- Public Services
- Recreation
- Transportation/Traffic
- Tribal Cultural Resources
- Utilities/Service Systems
- Wildfire
- Mandatory Findings of Significance

2.5 Negative Declaration/Mitigated Negative Declaration

If the initial study concludes that none of the impacts are significant, a Negative Declaration can be prepared for the project. Otherwise, if the initial study determines that the environmental impacts can be mitigated to less than significant levels, a Mitigated Negative Declaration can be prepared. Per CEQA guidelines, the initial study with the associated Negative Declaration or Mitigated Negative Declaration must be made available to the public for a 30-day review period.

The City of Los Angeles has provided the following guidance for completing a Negative Declaration or Mitigated Negative Declaration.

Negative Declaration:

- 1. Prepare an Initial Study. If the project does not have any potential significant impacts to the environment, then prepare a Negative Declaration.
- 2. Prepare a Negative Declaration.
- 3. Publish Notice of Intent to adopt for public review (20 or 30 days).
- 4. If project is approved, adopt the Negative Declaration.
- 5. File Notice of Determination with the Los Angeles County Clerk.

Mitigated Negative Declaration:

- 1. Prepare an Initial Study. If the project does have potential significant impacts to the environment, determine whether all significant impacts can be mitigated to less than significant levels.
- 2. If significant impacts can be mitigated to less than significant levels, prepare a Mitigated Negative Declaration.
- 3. Publish Notice of Intent to adopt for public review (20 or 30 days).
- 4. Adopt the Mitigated Negative Declaration.
- 5. File a Notice of Determination with the Los Angeles County Clerk.

2.6 Environmental Impact Report

The Environmental Impact Report (EIR) is developed when the project will or may have significant impacts to any environmental category that cannot be mitigated to less than significant levels. The EIR contains a thorough and complete environmental synopsis of the project that showcases the overall environmental impact analysis that the project has on its surrounding areas.

The City of Los Angeles has provided the following guidance for completing an EIR:

1. If the project does not qualify for an exemption, prepare an Initial Study.

- 2. If the project is determined to have potential significant impacts to the environment, and these impacts cannot be mitigated to less than significant levels, issue a Notice of Preparation of EIR.
- 3. Conduct scoping meeting (if required) and initiate 30-day public scoping period.
- 4. Prepare and release the draft EIR, file the Notice of Completion, and issue the Notice of Availability for public comment (30 to 60 days).
- 5. Respond to comments, make any edits, and prepare the final EIR.
- 6. Issue the final EIR and release the EIR for public inspection.
- 7. If the project is approved, certify the EIR.
- 8. File Notice of Determination with the Los Angeles County Clerk.

SECTION 3 ADDITIONAL COMPLIANCE MEASURES

When construction commences along the Orange Line and East San Fernando Transit locations the following permits and/or environmental concerns may need to be addressed:

- 1. Grading and construction permits will need to be attained from the City of Los Angeles, as a majority of the proposed locations are within City's limits.¹
 - Per the Los Angeles City Building Permit Handbook, CEQA Clearance is required for proposed grading when work in excess of 20,000 cubic yards of either cutting or filling is done on slopes steeper than 1 vertical in 10 horizontal.
- 2. Encroachment permits must be filed with the City of Los Angeles Bureau of Engineering, since most of the locations are near/within the public right of way.
- 3. Bureau of Sanitation (BOS) Stormwater Low Impact Development (LID) ordinance clearance is required for:
 - Projects which increase or replace impervious areas of 500 square feet or more due to any land disturbance (foundation, grading, etc.);
 - New construction;
 - Additions (> 500 square feet of impervious area);
 - o Re-grading of parking lots >500 square feet; and
 - o Impervious pads >500 square feet (i.e. equipment pads).
- 4. If one or more acres of soil will be disturbed, a State Water Resources Control Board Construction Permit is required.
- 5. During the construction phase of the project, the project must maintain compliance with SCAQMD Rule 403 (preventing, reducing, or mitigating fugitive dust emissions from constructions activities as required).

¹ If locations of construction are not located within the City of Los Angeles, obtain appropriate guidance and permitting requirements from the affected city.

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Initial Study Checklist

CITY OF LOS ANGELES

OFFICE OF THE CITY CLERK
ROOM 360, CITY HALL
LOS ANGELES, CALIFORNIA 90012

CALIFORNIA ENVIRONMENTAL QUALITY ACT INITIAL STUDY AND CHECKLIST

LEAD CITY AGENCY		COUNCIL	DISTRIC	т	DATE
City of Los Angeles Department of	City Planning				
RESPONSIBLE AGENCIES					
PROJECT TITLE/NO.			CASE N	0.	
PREVIOUS ACTIONS CASE NO.		☐ DOES ha	ve signifi	cant changes	from previous actions.
		☐ DOES NO	T have s	ignificant cha	nges from previous actions.
PROJECT DESCRIPTION:					
ENVIRONMENTAL SETTING:					
ENVIRONMENTAL SETTING:					
PROJECT LOCATION					
PLANNING DISTRICT			STATUS		
			☐ PR	RELIMINARY ROPOSED	
EXISTING ZONING	MAX. DENSITY ZONIN	G	☐ AD	OPTED	_
				☐ DOES	CONFORM TO PLAN
PLANNED LAND USE & ZONE	MAX. DENSITY PLAN				NOT CONFORM TO BLAN
					NOT CONFORM TO PLAN
SURROUNDING LAND USES	PROJECT DENSITY				TRICT PLAN

DETERMINATION (To be completed by Lead	I Agency)			
On the basis of this initial evaluation:				
☐ I find that the proposed project COULD NOT have a signific DECLARATION will be prepared.	cant effect on the environment, and a NEGATIVE			
☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions on the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.				
☐ I find the proposed project MAY have a significant effect on REPORT is required.	the environment, and an ENVIRONMENTAL IMPACT			
☐ I find the proposed project MAY have a "potentially significal impact on the environment, but at least one effect 1) has been applicable legal standards, and 2) has been addressed by miting attached sheets. An ENVIRONMENTAL IMPACT REPORT is be addressed.	adequately analyzed in an earlier document pursuant to gation measures based on earlier analysis as described on			
☐ I find that although the proposed project could have a signi significant effects (a) have been analyzed adequately in an ea applicable standards, and (b) have been avoided or mitigated including revisions or mitigation measures that are imposed up	rlier EIR or NEGATIVE DECLARATION pursuant to pursuant to that earlier EIR or NEGATIVE DECLARATION,			
SIGNATURE	TITLE			

EVALUATION OF ENVIRONMENTAL IMPACTS:

- 1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants based on a project-specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less that significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

- 4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of a mitigation measure has reduced an effect from "Potentially Significant Impact" to "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analysis," cross referenced).
- 5) Earlier analysis must be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR, or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:
 - a) Earlier Analysis Used. Identify and state where they are available for review.
 - b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c) Mitigation Measures. For effects that are "Less Than Significant With Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated
- 7) Supporting Information Sources: A sources list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- 8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whichever format is selected.
- 9) The explanation of each issue should identify:
 - a. The significance criteria or threshold, if any, used to evaluate each question; and
 - b. The mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

	ed below would be potentially affected be ficant Impact" as indicated by the check	
☐ Aesthetics	☐ Agricultural and Forestry Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology/Soils	☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials
☐ Hydrology/Water Quality	☐ Land Use/Planning	☐ Mineral Resources
☐ Noise	☐ Population/Housing	☐ Public Services
☐ Recreation	☐ Transportation/Traffic	☐ Tribal Cultural Resources
☐ Utilities/Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance
INITIAL STUDY CHECKLIST	(To be completed by the Lead City A	gency)
BACKGROUND		
PROPONENT NAME		PHONE NUMBER
PROPONENT ADDRESS		
AGENCY REQUIRING CHECKLIST		DATE SUBMITTED
PROPOSAL NAME (If Applicable)		

Œ			(Explanations of are required to				int impacts
				Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I.		ESTHETICS. Except as provided in Public de Section 21099, would the project:	Resources				
	a.	Have a substantial adverse effect on a s	cenic vista?				
	b.	Substantially damage scenic resources, not limited to, trees, rock outcroppings, a buildings within a state scenic highway?	and historic				
	C.	In non-urbanized areas, substantially de existing visual character or quality of pul the site and its surroundings? If the projeurbanized area, would the project conflicapplicable zoning and other regulations scenic quality?	olic views of ect is in an ct with				
	d.	Create a new source of substantial light would adversely affect day or nighttime area?					
III.	de sig to As De in a de ince lea Ca reç Fo Le me ad	termining whether impacts to agricultural a prificant environmental effects, lead agency the California Agricultural Land Evaluation sessment Model (1997) prepared by the Capartment of Conservation as an optional reassessing impacts on agriculture and farmatermining whether impacts to forest resounding timberland, are significant environmental agencies may refer to information compalifornia Department of Forestry and Fire Figarding the state's inventory of forest land rest and Range Assessment Project and agency Assessment project; and forest carbassurement methodology provided in Forest opted by the California Air Resources Boats project:	resources are sies may refer and Site California model to use aland. In rees, mental effects, siled by the Protection and including the the Forest on est Protocols				
	a.	Convert Prime Farmland, Unique Farmla Farmland of Statewide Importance (Farr shown on the maps prepared pursuant t Farmland Mapping and Monitoring Prog California Resources Agency, to non-ag	nland), as o the ram of the				
	b.	Conflict with existing zoning for agricultu Williamson Act contract?	ral use, or a				
	C.	Conflict with existing zoning for, or cause forest land (as defined in Public Resource section 12220(g)), timberland (as define Resources Code section 4526), or timber Timberland Production (as defined by G Code section 51104(g))?	ces Code d by Public erland zoned				

			Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	d.	Result in the loss of forest land or conversion of forest land to non-forest use?				
	e.	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				
III.	es air	R QUALITY. Where available, the significance criteria tablished by the applicable air quality management or pollution control district may be relied upon to make a following determinations. Would the project:				
	a.	Conflict with or obstruct implementation of the applicable air quality plan?				
	b.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?				
	C.	Expose sensitive receptors to substantial pollutant concentrations?				
	d.	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?				
IV.	ВІ	OLOGICAL RESOURCES. Would the project:				
	a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?				
	b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?				
	C.	Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				
	d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				

			Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				
	f.	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				
V.	Cl	JLTURAL RESOURCES. Would the project:				
	a.	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?				
	b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?				
	C.	Disturb any human remains, including those interred outside of dedicated cemeteries (see Public Resources Code, Ch. 1.75, §5097.98, and Health and Safety Code §7050.5(b))?				
VI.	ΕN	NERGY. Would the project:				
	a.	Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?				
	b.	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?				
VII.	GI	EOLOGY AND SOILS. Would the project:				
		Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:				
		 i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. 				
		ii. Strong seismic ground shaking?				
		iii. Seismic-related ground failure, including liquefaction?				
		iv. Landslides?				
	b.	Result in substantial soil erosion or the loss of topsoil?				
	C.	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				

			Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
	d.	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				
	e.	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				
	f.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				
VIII	l. GI	REENHOUSE GAS EMISSIONS. Would the project:				
	a.	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?				
	b.	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				
X.		AZARDS AND HAZARDOUS MATERIALS. Would the roject:				
	a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				
	b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?				
	C.	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				
	d.	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				
	e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?				
	f.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				
	g.	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?				

				Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X.		/DROLO oject:	GY AND WATER QUALITY. Would the				
	a.	require	any water quality standards or waste discharge ments or otherwise substantially degrade or groundwater quality?				
	b.	interfer that the	ntially decrease groundwater supplies or re substantially with groundwater recharge such re project may impede sustainable groundwater rement of the basin?				
	C.	site or course imperv	ntially alter the existing drainage pattern of the area, including through the alteration of the of a stream or river or through the addition of ious surfaces, in a manner which would: Result in substantial erosion or siltation on- or off-site;				
		ii.	Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;				
		iii.	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or				
		iv.	Impede or redirect flood flows?				
	d.		hazard, tsunami, or seiche zones, risk release itants due to project inundation?				
	e.	quality o	with or obstruct implementation of a water control plan or sustainable groundwater ement plan?				
XI.	LA	AND USE	E AND PLANNING. Would the project:				
	a.	Physica	lly divide an established community?				
	b.	conflict adopted	a significant environmental impact due to a with any land use plan, policy, or regulation of the purpose of avoiding or mitigating an mental effect?				
XII.	MI	NERAL	RESOURCES. Would the project:				
	a.	resourc	n the loss of availability of a known mineral e that would be of value to the region and the is of the state?				
	b.	mineral	n the loss of availability of a locally-important resource recovery site delineated on a local plan, specific plan or other land use plan?				

			Potentially Significant Impact	Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII	. NO	DISE.				
	a.	Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				
	b.	Would the project result in generation of excessive groundborne vibration or groundborne noise levels?				
	C.	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				
ΧIV	. P(OPULATION AND HOUSING. Would the project:				
	a.	Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				
	b.	Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				
XV.	pr far far er se	JBLIC SERVICES. Would the project result in abstantial adverse physical impacts associated with the ovision of new or physically altered governmental cilities, need for new or physically altered governmental cilities, the construction of which could cause significant particular impacts, in order to maintain acceptable ervice ratios, response times or other performance opectives for any of the public services:				
	a.	Fire protection?				
	b.	Police protection?				
	C.	Schools?				
	d.	Parks?				
	e.	Other public facilities?				
ΧV	l. RI	ECREATION.				
	a.	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				

Less Than

		Potentially Significant Impact	Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b.	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				
C.	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered park facilities, need for new or physically altered park facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, or other performance objectives for parks				
XVII.	TRANSPORTATION/TRAFFIC. Would the project:				
a.	Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?				
b.	Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?				
C.	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				
d.	Result in inadequate emergency access?				
XVIII.	TRIBAL CULTURAL RESOURCES. Would the project:				
a.	Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
	 i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or 				
	ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				

Less Than

			Potentially Significant Impact	Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX	. UT	TILITIES AND SERVICE SYSTEMS. Would the project:				
	a.	Have sufficient water supplies available to serve the project and reasonable foreseeable future development during normal, dry and multiple dry years?				
	b.	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				
	C.	Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?				
	d.	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?				
XX.	or	LDFIRE. If located in or near state responsibility areas lands classified as very high fire hazard severity zones, ould the project:				
	a.	Substantially impair an adopted emergency response plan or emergency evacuation plan?				
	b.	Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?				
	C.	Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?				
	d.	Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?				
XXI	. M	ANDATORY FINDINGS OF SIGNIFICANCE.				
	a.	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				

Less Than

			Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b.	Does the project have impacts t limited, but cumulatively considerable" means that the in project are considerable when with the effects of past projects, current projects, and the effects projects).	erable? ("Cumulatively cremental effects of a riewed in connection the effects of other				
C.	Does the project have environm cause substantial adverse effective either directly or indirectly?					
DISCUSSION OF THE ENVIRONMENTAL EVALUATION (Attach additional sheets if necessary)						
PREPARED BY		TITLE		TELEPHONE #	DAT	E

A	ГΤ	'Α	CH	ſΜ	\mathbf{F}	T	B

Notice of Exemption Form

Notice of Exemption

Appendix E

To: Office of Planning and Research P.O. Box 3044, Room 113 Sacramento, CA 95812-3044	From: (Public Agency):				
County Clerk					
County of:	(Address)				
					
					
Project Title:					
Project Applicant:					
Project Location - Specific:					
Pariotal continue Oites	Deciret Leasting Country				
Description of Nature, Purpose and Beneficia	Project Location - County:				
Description of Nature, Fulpose and Beneficia	aries of Project.				
Name of Person or Agency Carrying Out Pro Exempt Status: (check one): Ministerial (Sec. 21080(b)(1); 15268 Declared Emergency (Sec. 21080(b)(4)) Emergency Project (Sec. 21080(b)(4)) Categorical Exemption. State type a)(3); 15269(a));				
Lead Agency Contact Person: If filed by applicant: 1. Attach certified document of exemptic 2. Has a Notice of Exemption been filed					
·	Date: Title:				
☐ Signed by Lead Agency ☐ Sign	ей ру Арріісані				
Authority cited: Sections 21083 and 21110, Public Res Reference: Sections 21108, 21152, and 21152.1, Public Res					

ATTACHMENT C

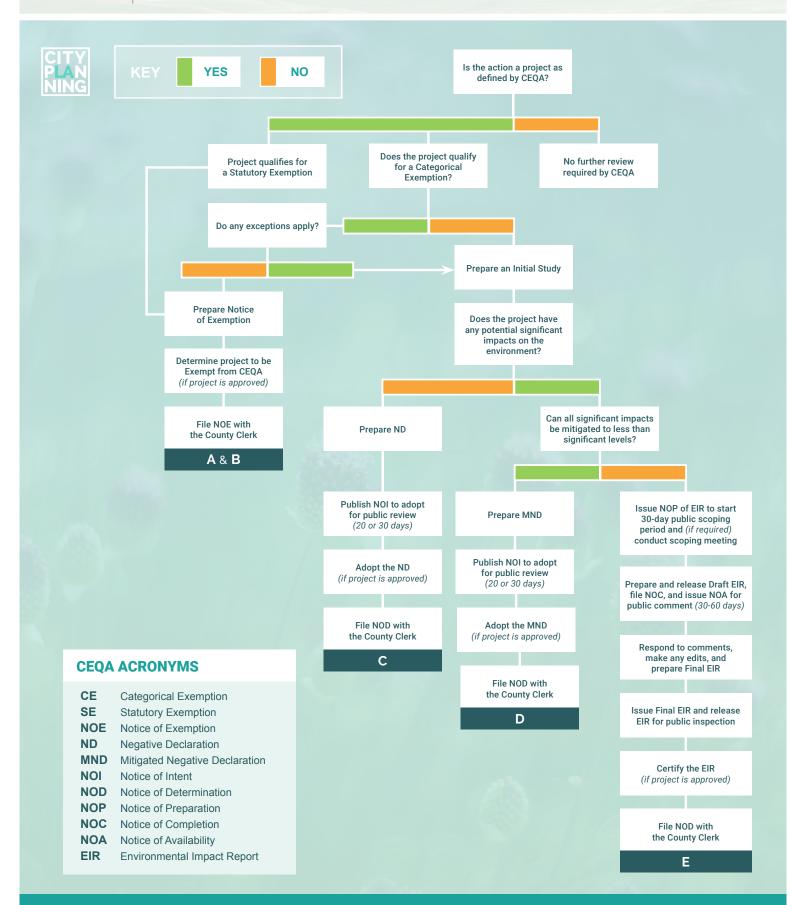
Notice of Determination Form

Notice of Determination	on	Appendix D
To: Office of Planning and Researd U.S. Mail: P.O. Box 3044 Sacramento, CA 95812-3044 County Clerk County of: Address:	Street Address: 1400 Tenth St., Rm 113 Sacramento, CA 95814	From: Public Agency: Address: Contact: Phone: Lead Agency (if different from above): Address: Contact:
		Phone:
SUBJECT: Filing of Notice of E Resources Code.	Determination in compli	ance with Section 21108 or 21152 of the Publi
	submitted to State Cleari	nghouse):
This is to advise that the(Lead Agency or Re	has approved the above esponsible Agency)
described project on(date) described project.		ne following determinations regarding the above
☐ A Negative Declaration was 3. Mitigation measures [☐ were 4. A mitigation reporting or monit 5. A statement of Overriding Con 6. Findings [☐ were ☐ were no	Report was prepared for the project of the prepared for this project or were not made a coloring plan [was was derations [was was derations [was the property was with comments and response.]	his project pursuant to the provisions of CEQA. It pursuant to the provisions of CEQA. Indition of the approval of the project. It pursuant to the provisions of CEQA. Indition of the approval of the project. It provisions adopted for this project. It provisions of CEQA. It provisions of CEQA. It provisions of CEQA.
Signature (Public Agency):		Title:
Date:	Date Rece	ived for filing at OPR:

ATTACHMENT D

City of Los Angeles CEQA Flow Chart

CALIFORNIA ENVIRONMENTAL QUALITY ACT FLOW CHART





ATTACHMENTS FOR SECTION 8.2:

VECTOR MINIMIZATION





engineers | scientists | innovators

Vector Minimization Plan

Metro Orange Line Water Infiltration and Quality Project

1. INTRODUCTION

The Metro Orange Line Water Infiltration and Quality Project (Project) proposes to design and implement distributed low impact development (LID) infiltration best management practices (BMPs) within LA Metro parcels and right-of-way (ROW) in the East San Fernando Valley. The Project will coincide with the Metro Orange Line Bus Rail Transit (MOL BRT) Improvement Project, one of Metro's self-funded capital improvement projects. The purpose and need of the Project is to capture and infiltrate stormwater runoff, to improve downstream water quality, help recharge the groundwater basin, and mitigate localized nuisance flooding in disadvantaged communities and neighborhoods with significant unmet needs within the neighboring geographical area. This will be accomplished through the installation of 168 drywells, as well as underground pretreatment facilities, separated into seven geographic clusters.

2. VECTOR CONTROL PROCEDURES

Control of mosquitos and other vectors in stormwater management Best Management Practices (BMPs) is critical for protecting public health. The State of California Health and Human Services Agency's Checklist for Minimizing Vector Production in Stormwater Management Structures (Checklist)¹ was used to evaluate opportunities to minimize the proliferation of vectors. The BMPs included in the Project are all categorized as dry systems by the Checklist. The BMPs are designed to drain completely following capture and/or treatment of runoff and they are installed below-grade. In order for the BMPs to function properly, proper operations and maintenance (O&M) of the BMPs will be regularly conducted.

2.1 Dry System Checklist

- Is the structure designed to discharge all captured water in 4 days or less?
 - Yes, all BMPs are designed to drain fully in 48 hours with proper O&M Plan implementation.
- Has every effort been made to trace and eliminate persistent non-stormwater flows (e.g. irrigation runoff) that may enter the system and jeopardize non-chemical vector control efforts?
 - Yes, non-stormwater flows will be identified and investigated during BMP O&M inspections.

Vector Minimization Plan 1 October 2020

¹https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ChecklistforVectorPreventioninBMPs.pdf

- Has groundwater depth been carefully evaluated to ensure that the structure will not be permanently or seasonally flooded (i.e. is the base of the basin higher than the local groundwater table)?
 - Yes, groundwater depths in the Project area are sufficiently deep to prevent permanent or seasonal flooding.
- Does the design provide an adequate slope between the inlets and outlets, with special attention given to ensure corners are above grade?
 - Yes, upon final design, flow between from the diversion structure and the BMPs will be designed to provide adequate slope.
- Has soil been compacted adequately during grading to minimize subsidence, which can result in pools of standing water?
 - Yes, final grading over the below-grade BMPs will be completed in a manner to prevent ponding at the surface.
- Does the design slope take into consideration the inevitable accumulation of sediment and debris between maintenance periods that can result in standing water, especially in and around the inlet?
 - N/A
- Does the design minimize the use of features that increase the potential for standing water, such as loose riprap and concrete curbs?
 - Yes, these features are not included in Project BMPs
- Does the structure include a concrete or earthen low-flow channel to concentrate (i.e. minimize available surface area) and direct non-stormwater flows to the outlet?
 - N/A, all BMPs are infiltration BMPs, and do not have a surface outlet.
- Is the distribution piping sloped adequately and smooth (not corrugated) on the inside to prevent standing water?
 - Yes, final design of piping between BMPs will be smooth to prevent standing water.
- Are the inlet structures and energy dissipaters designed and sloped sufficiently to prevent scour depressions?

— N/A

- Are the outlets designed with debris screens or other features that reduce the potential for clogging?
 - o N/A, all BMPs are infiltration BMPs, and do not have a surface outlet.
- Is the structure designed with safe and sufficient access for inspection, maintenance, and/or vector control activities when needed?
 - Yes, all BMPs will have maintenance access structures.
- Does the operation and maintenance plan include a minimum of quarterly inspections to ensure that vegetation overgrowth, sediment accumulation, or other factors have not created areas of standing water?
 - Yes, the operation and maintenance plan does include quarterly inspections to evaluate BMP condition, including sediment accumulation.
- Does the operation and maintenance plan include a minimum annual maintenance to remove vegetation overgrowth, remove sediment and debris accumulation, and otherwise return the structure to "as-designed" conditions?
 - Yes, annual maintenance as detailed in the Project O&M Plan will be conducted to maintain pump stations and pretreatment facilities where most sediment buildup is expected. With proper operation and maintenance conducted at the pretreatment facilities, the drywells will require less frequent O&M (once every five years).
- Is signage provided and clearly visible with minimum information indicating the type of structure (e.g. extended detention basin), ownership, and contact information?
 - Yes, visible signature will be constructed to indicate stormwater BMP type (drywells), ownership and contact information

3. SUMMARY

The below-grade design of the BMPs and rapid drawdown rate of two days are expected to mitigate many of the risks for vector proliferation. Additionally, scheduled maintenance of the BMPs as detailed in the Operation and Maintenance Plan will ensure the BMPs continue to function as designed.



ATTACHMENTS FOR SECTION 8.6:

TECHNICAL REPORTS



ATTACHMENTS FOR SECTION 8.7:

OTHER









Drought Tolerant Tree Palette

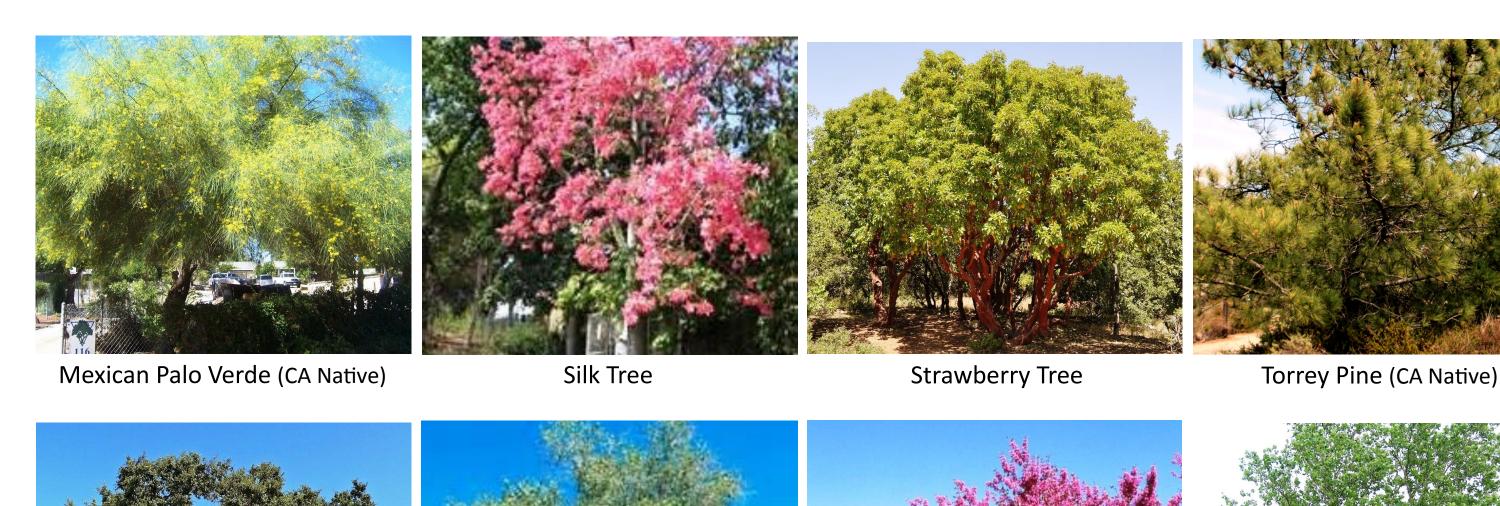


California Bayberry (CA Native) California Walnut (CA Native)

Coast Live Oak (CA Native)

Desert Willow (CA Native)

Drought Tolerant Tree Palette





Valley Oak (CA Native)



Western Cottonwood (CA Native)



Western Redbud (CA Native)



Western Sycamore (CA Native) (Drought Tolerant when Established)