Appendix G

Preliminary Water Quality Management Plan

Final Water Quality Management Plan (WQMP)

Project Name:

Talbert & Newland

Tentative Tract Map No. 19157

GPA-2021-002

ZMA-2021-001

CUP-2021-004

Prepared for:

The Olson Company

8371-8375 Talbert Avenue

Huntington Beach, CA 92646

(562)596-4770

Prepared by:

Advanced Civil Group

Engineer: R. Steven Austin Registration No.: R.C.E. No. 68795

30251 Golden Lantern, Suite E, PMB 251

Laguna Niguel, CA 92677

(866)338-5778

Project Owner's Certification			
Permit/Application No.	PA-202-0084	Grading Permit No.	TBD
Tract/Parcel Map No.	TTM 19157	Building Permit No.	TBD
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract)			APN's: 167-531-23 & -24

This Water Quality Management Plan (WQMP) has been prepared for The Olson Company by Advanced Civil Group. The WQMP is intended to comply with the requirements of the local NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Owner: Tom Moore			
Title	VP, Operational Planning		
Company	The Olson Company		
Address	3010 Old Ranch Parkway, Suite 100 Seal Beach, CA 90740		
Email	tmoore@theolsoncompany.com		
Telephone #	(562)596-4770		
Signature		Date	

Preparer (Engineer): R. Steven Austin, PE			
Title	Principal	PE Registration #	68795
Company	Advanced Civil Group, Inc.		
Address	30251 Golden Lantern, Suite E, PMB 251 Laguna Niguel, CA 92677		
Email	steve@advancedcivilgroup.com		
Telephone #	(866) 338-5778		

I hereby certify that this Water Quality Management Plan is in compliance with, and meets the requirements set forth in, Order No. R8-2009-0030/NPDES No. CAS618030, of the Santa Ana Regional Water Quality Control Board.

Preparer Signature		Date	
Place Stamp Here			

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Attachments

Attachment A ..... LID Feasibility Screening and Calculation Worksheets

Attachment B ..... Educational Materials

Attachment C .....Public Works Project Implementation Code Requirements

Attachment D ..... Geotechnical Report

Attachment E ..... Notice of Transfer of Maintenance Responsibility

Section I Discretionary Permit(s) and Water Quality Conditions

Project Infomation			
Permit/Application No.	PA-2021-0084	Tract/Parcel Map No.	19157
Additional Information/ Comments:			

Water Quality Conditions	
Water Quality Conditions (list verbatim)	THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO ISSUANCE OF A GRADING PERMIT: 4. Prior to the issuance of any grading or building permits for projects that will result in soil disturbance of one or more acres of land, the applicant shall demonstrate that coverage has been obtained under the Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ) [General Construction Permit] by providing a copy of the Notice of Intent (NOI) submitted to the State of California Water Resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number. Projects subject to this requirement shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) conforming to the current National Pollution Discharge Elimination System (NPDES) requirements shall be submitted to the Department of Public Works for review and acceptance. A copy of the current SWPPP shall be kept at the project site and another copy to be submitted to the City. (DAMP) 5. A Project Water Quality Management Plan (WQMP) conforming to the current Waste Discharge Requirements Permit for the County of Orange (Order No. R8-2009-0030) [MS4 Permit] prepared by a Licensed Civil Engineer, shall be submitted to the Department of Public Works for review and acceptance. The WQMP shall address Section XII of the MS4 Permit and all current surface water quality issues. 6. The project WQMP shall include the following: a. Discusses regional or watershed programs (if applicable).

	b. Addresses Site Design BMPs (as applicable) such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, creating reduced or "zero discharge" areas, and conserving natural areas. c. Identifies selected Low Impact Development (LID) and Hydromodification (as applicable) BMPS. d. Incorporates the Guidelines for Use of Drywells in Stormwater Management Applications (if applicable). e. Incorporates the applicable Routine Source and Structural Control BMPs as defined in the Drainage Area Management Plan. (DAMP) f. Incorporates GIS or GPS coordinates for all structural and LID BMPs. g. Describes the long-term operation and maintenance requirements for the Structural and Treatment Control BMPs, including maintenance of BMPs as shown on the landscape plans and are described in the WQMP. h. Identifies the entity that will be responsible for long-term operation, maintenance, repair and/or replacement of the Structural and Treatment Control BMPs. i. Describes the mechanism for funding the long-term operation and maintenance of all the Structural and Treatment Control BMPs. j. Includes an Operations and Maintenance (O&M) Plan for all structural and Treatment Control BMPs including anticipated maintenance costs. k. Vector Control Clearance letter from the Orange County Vector Control stating that they have reviewed the project WQMP and proposed BMPs. l. After incorporating plan check comments of Public Works, three final WQMPs (signed by the owner and the Registered Civil Engineer of record) shall be submitted to Public Works for acceptance. After acceptance, two copies of the final report shall be returned to applicant for the production of a single complete electronic copy of the accepted version of the WQMP on CD media that includes: i. The 11" by 17" Site Plan in .TIFF format (400 by 400 dpi minimum). ii. The remainder of the complete WQMP in .PDF format including the signed and stamped title sheet, owner's certification sheet,

	Inspection/Maintenance Responsibility sheet, appendices, attachments and all educational material. m. The applicant shall return one CD media (with a copy of the approved WQMP) to Public Works for the project record file. 7. Indicate the type and location of Water Quality Treatment Control Best Management Practices (BMPs) on the Grading Plan consistent with the Project WQMP. The WQMP shall follow the City of Huntington Beach; Project Water Quality Management Plan Preparation Guidance Manual dated June 2008. The WQMP shall be submitted with the first submittal of the Grading Plan. 8. A suitable location, as approved by the City, shall be depicted on the grading plan for the necessary trash enclosure(s). The area shall be paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, and screened or walled to prevent off-site transport of trash. The trash enclosure area shall be covered or roofed with a solid, impervious material. Connection of trash area drains into the storm drain system is prohibited. If feasible, the trash enclosure area shall be connected into the sanitary sewer. (DAMP) THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO FINAL INSPECTION OR OCCUPANCY: 31. Prior to grading or building permit close-out and/or the issuance of a certificate of use or a certificate of occupancy, the applicant shall: a. Demonstrate that all structural Best Management Practices (BMPs) described in the Project WQMP have been constructed and installed in conformance with approved plans and specifications. b. Demonstrate all drainage courses, pipes, gutters, basins, etc. are clean and properly constructed. c. Demonstrate that applicant is prepared to implement all non-structural BMPs described in the Project WQMP. d. Provide certifications from the Engineer of Record or Landscape Architect that the LID BMPs were constructed and installed per the approved project plans and specifications. The certifications shall be included in the final WQMP. e. Demonstrate that an adequate number of copies of the approved Project WQMP are available for the future occupiers. f. Demonstrate that the preparer of the WQMP has reviewed the BMP

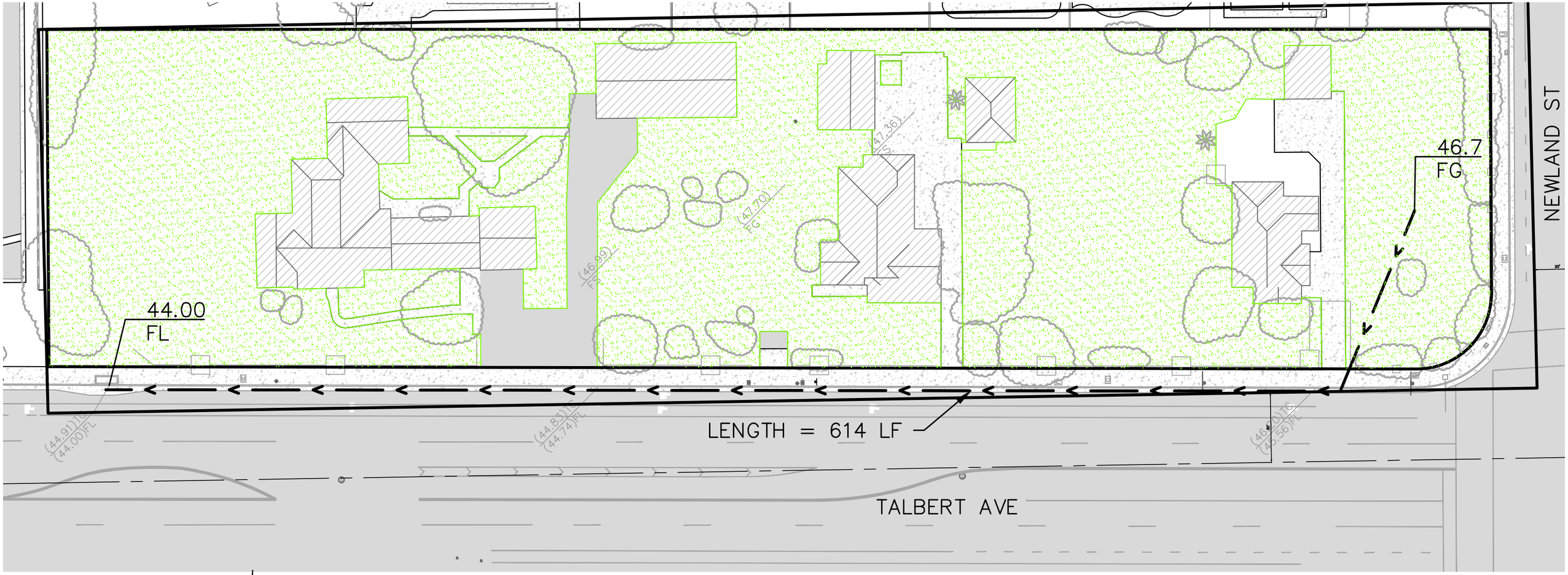
	maintenance requirements in Section V of the WQMP with the responsible person and that a copy of the WQMP has been provided to that person. A certification letter from the WQMP preparer may be used to satisfy this condition.
Watershed-Based Plan Conditions	
Provide applicable conditions from watershed - based plans including WIHMPs and TMDLS.	

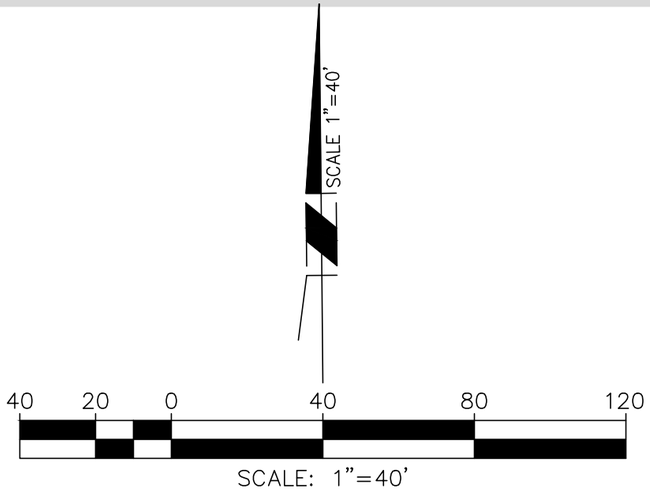
Section II Project Description

II.1 Project Description

Description of Proposed Project				
Development Category (Verbatim from WQMP):	All significant redevelopment projects, where significant redevelopment is defined as the addition or replacement of 5,000 or more square feet of impervious surface on an already developed site. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the facility, or emergency redevelopment activity required to protect public health and safety. If the redevelopment results in the addition or replacement of less than 50 percent of the impervious area on-site and the existing development was not subject to WQMP requirement, the numeric sizing criteria discussed in Section 7.II-2.0 only applies to the addition or replacement area. If the addition or replacement accounts for 50 percent or more of the impervious area, the Project WQMP requirements apply to the entire development.			
Project Area (ft^2): 89,949	Number of Dwelling Units: 34 Units		SIC Code: N/A	
Narrative Project Description:	Under proposed conditions the Talbert & Newland development for residential use and plans to consist of 9 buildings consisting of 34 units. Associated interior driveways and private drive isles, common area, landscaping, surface parking spaces along the private drive, perimeter walls, and underground utilities are proposed. Landscaped areas maintained by the HOA. There will not be any residential features that are of particular water quality concern proposed for the project. The project will not include swimming pools, outdoor storage areas, or recreational facilities of note. The proposed project does not include any right-of-ways that will incorporate green street design to address water quality, as the LID BMPs proposed for the project site meet or exceed the benefits of what green streets would otherwise achieve.			
Project Area	Pervious		Impervious	
	Area (acres or sq ft)	Percentage	Area (acres or sq ft)	Percentage
Pre-Project Conditions	1.53 acres	73.9%	0.53 acre	26.1%
Post-Project Conditions	0.54 acre	26.0%	1.52 acre	74.0%

Drainage Patterns/Connections	After storm flows leave the site, via an existing City catch basin, they travel northerly in the City's storm drain system, which then outlets to the existing City C6-SC1 channel. Flows from this channel travel further north to the Ocean View Channel, which is located north of Warner Avenue, and then converge with the County's East Garden Grove Wintersburg (EGGW) channel. The EGGW channel ultimately outlets to Bolsa Chica Bay and Huntington Harbour which then flow toward Anaheim Bay and to the Pacific Ocean at Bolsa Chica State Beach.





	TOTAL AREA	2.06 AC
	PERVIOUS AREA	1.53 AC
	% PERVIOUS	73.9 %
	% IMPERVIOUS	26.1 %

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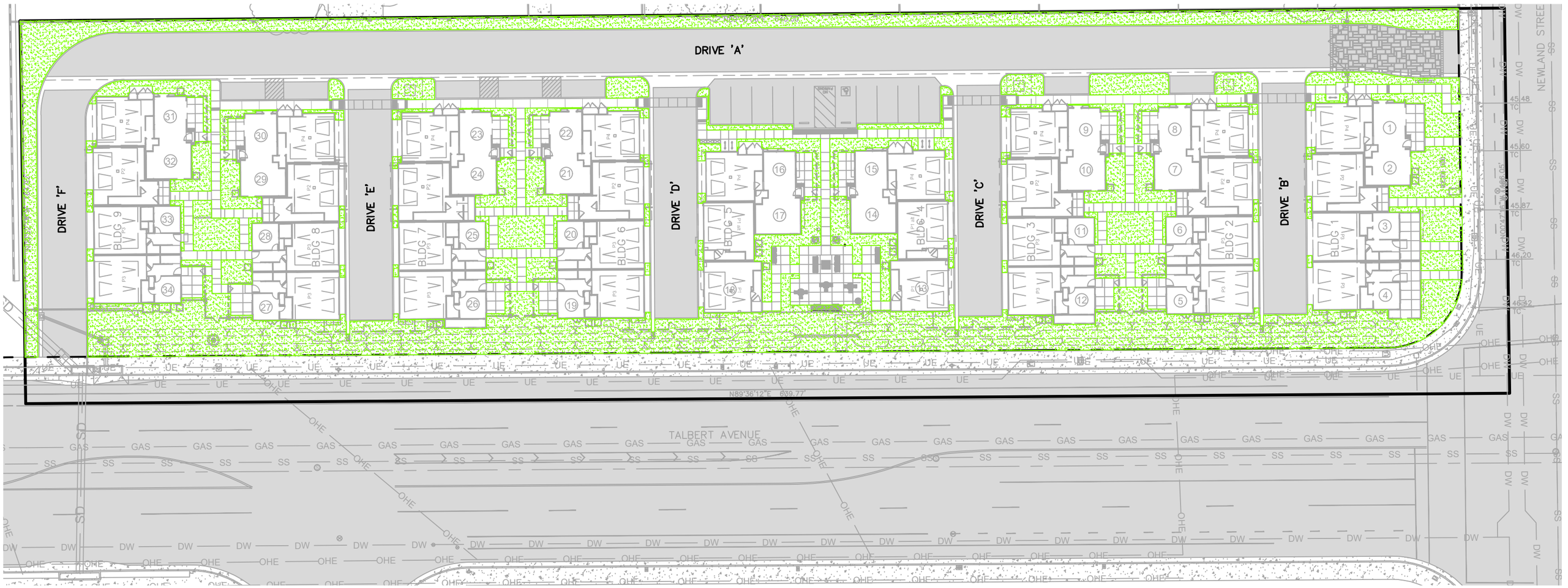
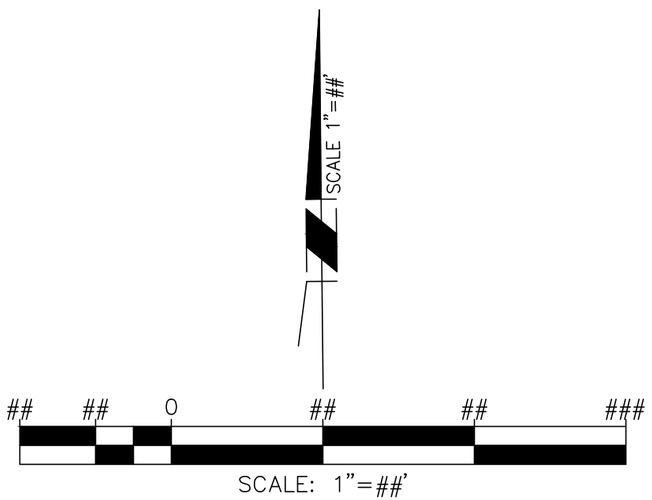
PREPARED BY: R. Stan Austin R.C.E. NO. 68795

DATE 3/1/2022

HYDROLOGY MAP
EXISTING CONDITION
TENTATIVE TRACT NO. 19157
HUNTINGTON BEACH





	TOTAL AREA	2.06 AC
	PERVIOUS AREA	0.54 AC
	% PERVIOUS	26.2 %
	% IMPERVIOUS	73.8 %

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R.C.E. NO. 68795

DATE 3/1/2022

PERVIOUS AREA PROPOSED CONDITION TENTATIVE TRACT NO. 19157

HUNTINGTON BEACH

II.2 Potential Stormwater Pollutants

Pollutants of Concern			
Pollutant	Circle One: E=Expected to be of concern N=Not Expected to be of concern		Additional Information and Comments
Suspended-Solid/ Sediment	(E)	N	Residential Development
Nutrients	(E)	N	Residential Development
Heavy Metals	E	(N)	
Pathogens (Bacteria/Virus)	(E)	N	Residential Development
Pesticides	(E)	N	Residential Development
Oil and Grease	(E)	N	Residential Development
Toxic Organic Compounds	E	(N)	
Trash and Debris	(E)	N	Residential Development

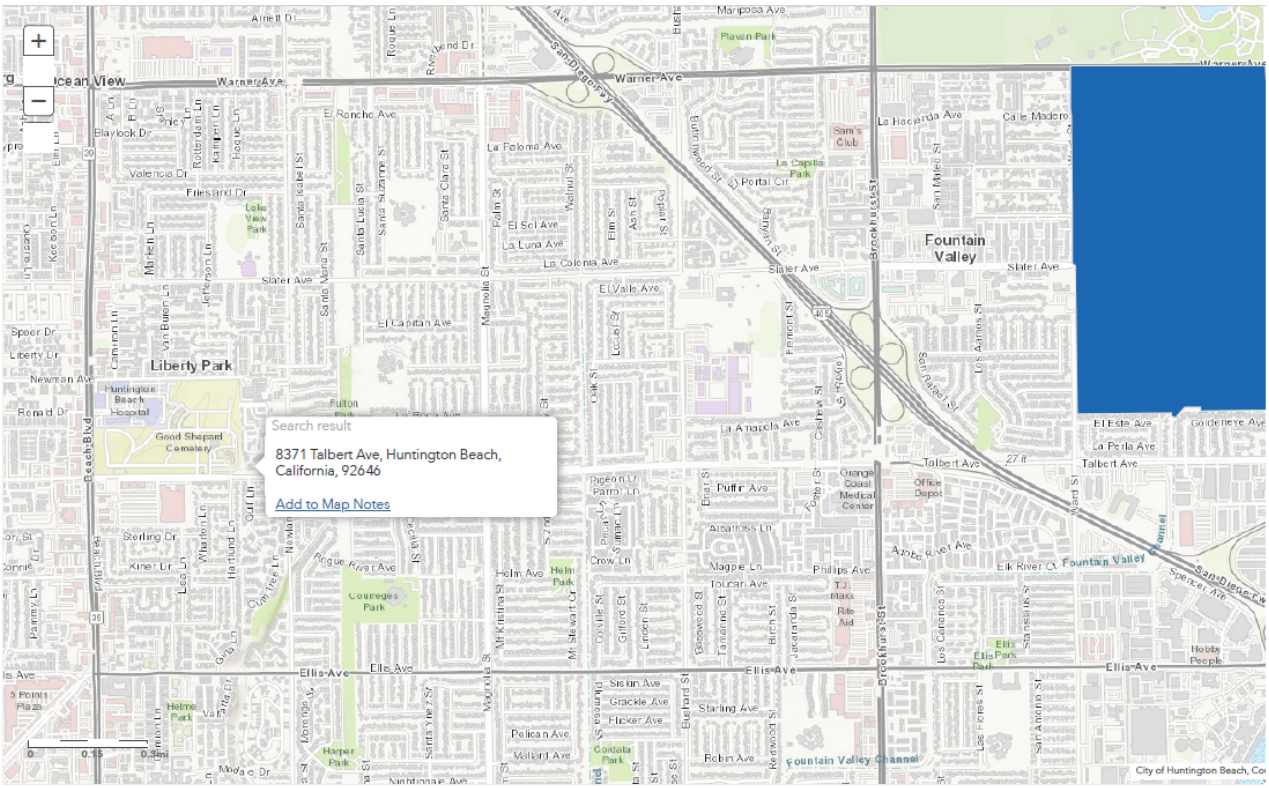
II.3 Hydrologic Conditions of Concern

Determine if streams located downstream from the project area are determined to be potentially susceptible to hydromodification impacts.

☒ No – Show map

☐ Yes – Describe applicable hydrologic conditions of concern below. *Refer to Section 2.2.3 in the TGD.*

The project is not susceptible to hydromodification impacts because all downstream receiving waters, are considered stabilized. See map provided below, where the project site is clearly outside of the area of susceptibility shaded in blue. Therefore, there area no HCOC's for the project.



II.4 Post Development Drainage Characteristics

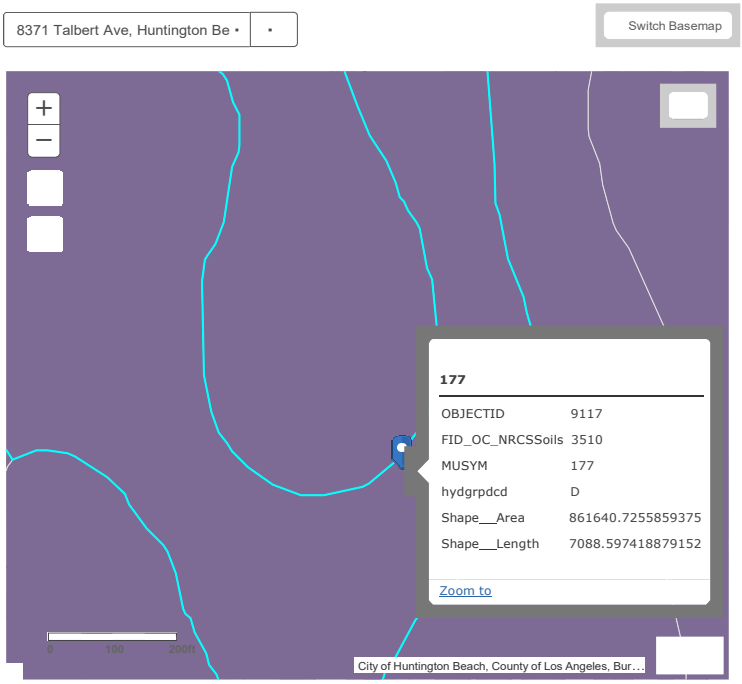
In the post-development condition, the proposed project will maintain existing drainage patterns. The site's runoff drains to and is collected in the north/south drive isle gutters and conveyed in a southerly direction towards two proposed bioswales. High flows drain west and discharge to the existing catch basin in the north side of Talbert Avenue through a proposed storm drain connection.

II.5 Property Ownership/Management

A Homeowners Association (HOA) will be formed upon project completion. The HOA will be responsible for inspecting and maintaining all BMPs prescribed for Tract No. 19157 at 8371-8375 Talbert Avenue. Until an HOA is formally established, The Olson Company shall assume all BMP maintenance and inspection responsibilities for the proposed project. Inspection and maintenance responsibilities are outlined in Section V of this report. No infrastructure will be transferred to any public agencies.

Section III Site Description

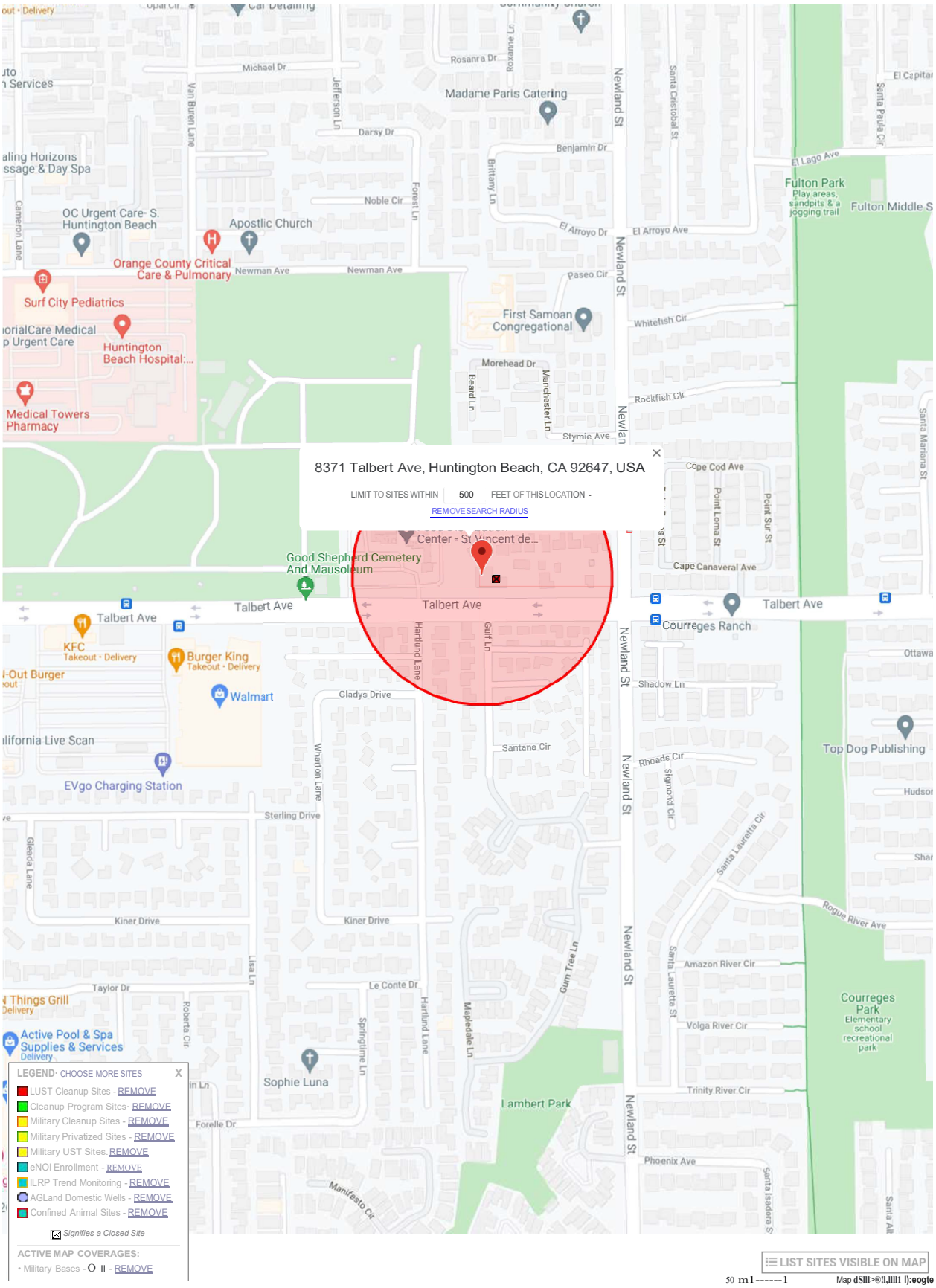
III.1 Physical Setting

Planning Area/ Community Name	Talbert & Newland
Location/Address	8371-8375 Talbert Avenue Huntington Beach, CA
Land Use	Residential
Zoning	Low Density Residential
Acreage	2.06 acres
Predominant Soil Type	Hydrologic Soil Type D **Watershed Infiltration & Hydromodification Management Plan (WIHMP)** (WIHMP) Watershed Infiltration & Hydromodification Management Plan data that are useful for implementation oflow impact development (LID), indentification of hydromodification conditions of concern (HCOC), and  watershedplanning

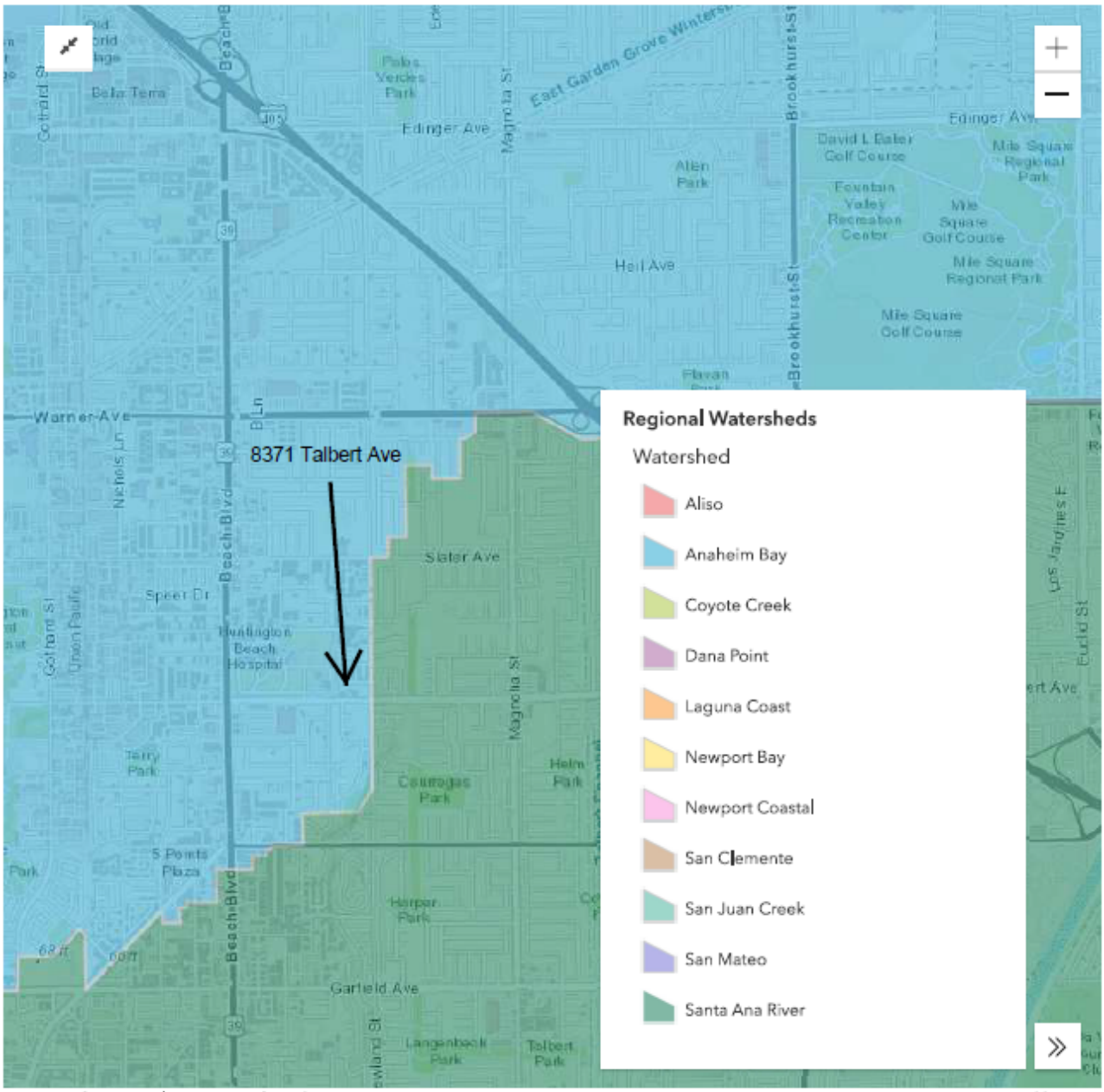
III.2 Site Characteristics

Precipitation Zone	0.70 inches
Topography	Not located within a potential landslide area, according to Figure XVI-2c of the TGD. The project site is relatively flat with a slight grade in a westerly direction.
Drainage Patterns/Connections	After storm flows leave the site, via an existing City catch basin, they travel northerly in the City's storm drain system, which then outlets to the existing City C6-SC1 channel. Flows from this channel travel further north to the Ocean View Channel, which is located north of Warner Avenue, and then converge with the County's East Garden Grove Wintersburg (EGGW) channel. The EGGW channel ultimately outlets to Bolsa Chica Bay and Huntington Harbour which then flow toward Anaheim Bay and to the Pacific Ocean at Bolsa Chica State Beach.
Soil Type, Geology, and Infiltration Properties	Soil materials encountered on site generally consist of very old marine deposits (Qvom) locally mantled by artificial fill (CDMG 1997). The very old marine deposits were present to the maximum depth explored (51.5 feet). Artificial fill materials were encountered up to about 8 feet below the existing ground surface only within B-1 and generally consist of light brown to brown silty sand with gravel. These materials are typically dry to damp and medium dense to dense. Artificial fill materials of greater depth may present beneath portions of the site in association with the existing development and underground utilities. Very old marine deposits (Qvom) underlie below the current grade or the artificial fill within the site. The near surface very old marine materials consist of reddish brown, damp, very stiff to hard clay. Deeper portion of the very old marine deposits consist of brown, olive brown, and grayish brown, damp to wet, medium dense to very dense clay sand, silty sand, sand with silt, and sand. A more detailed description of the interpreted soil profile at each of the boring locations, based upon the borehole cuttings and soil samples, are presented in Attachment A. The stratigraphic descriptions in the logs represent the predominant materials encountered and relatively thin, often discontinuous layers of different material may occur within the major divisions.

Site Characteristics (continued)	
Hydrogeologic (Groundwater) Conditions	Groundwater was encountered during this firm's subsurface exploration at a depth of 38 feet below the existing ground surface. The CDMG Seismic Hazard Zone Report 03 suggest that historical high groundwater for the subject site is deeper than 30 feet.
Geotechnical Conditions (relevant to infiltration)	Most of the site is characterized by alternating layers of fined-grained and course-grained soils in the upper 8 to 10 feet that are generally not suitable for infiltration. Below 10 feet the site is underlain by relatively clean sands that provide exceptionally good infiltration characteristics. Therefore, infiltration of storm water using either shallow chambers or dry wells is feasible. Preliminary analyses indicate that a dry well could likely provide a peak measured infiltration flow of approximately 0.29 cfs and empty within 0.24 hours. The typical dry well is estimated to be 20 feet deep. Assuming a factor of safety of 2.5 and an allowable drawdown time of 72 hours, the maximum treatment volume is calculated to be 30,000 ft3. This volume is anticipated to be well above the required treatment volume for storm water. Assuming the treatment volume is about 6,000 ft3, an additional retention of about 5,700 ft3 is anticipated and could be accommodated by storage pipes or other systems connected in line with the dry well. If a shallow chamber system is used, the bottom of the system will need to be placed at a depth of about 8 to 10 feet. Preliminary design of a shallow chamber system can be based on a measured infiltration rate of 10 in.hr. Assuming a factor of safety of 2.5, the chamber system would need to cover an area of about 250 square feet. Further percolation testing and/or evaluation may be necessary based on review of preliminary WQMP design plans. According to the Geotracker website, the project site has one LUST cleanup site within the project's vicinity. No soil contamination concerns are located within 250 feet of the project. See figure below.
Off-Site Drainage	Storm water from intense storm events will flow from the proposed site into the catch basin on Talbert where it will combine with storm water flows from adjacent properties. No storm water will flow onto the proposed project site.
Utility and Infrastructure Information	There are no existing subsurface utilities that will impact the location of LID BMPs on-site. Any existing utilities will be removed and/or replaced.


8371 Talbert Ave, Huntington Beach, CA 92647, USA
LIMIT TO SITES WITHIN 500 FEET OF THIS LOCATION -
REMOVE SEARCH RADIUS
Talbert Ave
Newland St
Madame Paris Catering
Fulton Park
Play areas, sandpits & a jogging trail
Fulton Middle S
OC Urgent Care- S. Huntington Beach
Apostlic Church
Orange County Critical Care & Pulmonary
Surf City Pediatrics
Huntington Beach Hospital:...
Medical Towers Pharmacy
First Samoan Congregational
Good Shepherd Cemetery And Mausoleum
Center - St Vincent de...
KFC
Takeout · Delivery
Burger King
Takeout · Delivery
Walmart
EVgo Charging Station
Courreges Ranch
Top Dog Publishing
Courreges Park
Elementary school recreational park
Lambert Park
Sophie Luna
Active Pool & Spa Supplies & Services
Delivery
LEGEND · CHOOSE MORE SITES
LUST Cleanup Sites - REMOVE
Cleanup Program Sites - REMOVE
Military Cleanup Sites - REMOVE
Military Privatized Sites - REMOVE
Military UST Sites - REMOVE
eNOI Enrollment - REMOVE
ILRP Trend Monitoring - REMOVE
AGLand Domestic Wells - REMOVE
Confined Animal Sites - REMOVE
Signifies a Closed Site
ACTIVE MAP COVERAGES:
• Military Bases - REMOVE
LIST SITES VISIBLE ON MAP

III.3 Watershed Description



Receiving Waters	Bolsa Chica Bay and Huntington Harbour toward Anaheim Bay and to the Pacific Ocean at Bolsa Chica State Beach
303(d) Listed Impairments	Nickel (69290), Toxicity (69325), PCBs (Polychlorinated biphenyls) (78840), Chlordane (68183), Copper (68882), PCBs (Polychlorinated biphenyls) (70200), Toxicity (76729), Lead (80431), Indicator Bacteria (97909)
Applicable TMDLs	Pesticides
Pollutants of Concern for the Project	Expected pollutants from attached residential developments include sediment, nutrients, pathogens, pesticides, oil & grease, and trash. Based on the 303(d) listed impairments and TMDLs for the project's receiving waters, the pollutants of concern are pesticides.
Environmentally Sensitive and Special Biological Significant Areas	There are no ESA's or ASBS within the project's vicinity.

Section IV Best Management Practices (BMPs)

IV. 1 Project Performance Criteria

Is there an approved WIHMP or equivalent for the project area that includes more stringent LID feasibility criteria or if there are opportunities identified for implementing LID on regional or sub-regional basis?		YES ☐	NO ☐
If yes, describe WIHMP feasibility criteria or regional/sub-regional LID opportunities.			

Project Performance Criteria (continued)	
If HCOC exists, list applicable hydromodification control performance criteria (Section 7.II-2.4.2.2 in MWQMP)	As explained in Section II.3 of this report, the proposed project is not located within an area that is hydromodification susceptible. All downstream receiving waters are considered stabilized. Therefore, HCOCs do not exist for the proposed project.
List applicable LID performance criteria (Section 7.II-2.4.3 from MWQMP)	Infiltrate, harvest and use, evapotranspire, or biotreat/biofilter, the 85th percentile, 24-hour storm event (Design Capture Volume). LID BMPs must be designed to retain, on-site, (infiltrate, harvest and use, or evapotranspire) storm water runoff up to 80 percent average annual capture efficiency. The proposed project will biotreat the entire DCV via bioswales (BMP BIO-2).
List applicable treatment control BMP performance criteria (Section 7.II-3.2.2 from MWQMP)	If it is not feasible to meet LID performance criteria through retention and/or biotreatment provided on-site or at a sub-regional/regional scale, then treatment control BMPs shall be provided on-site or offsite prior to discharge to waters of the US. Sizing of treatment control BMP(s) shall be based on the unmet volume after claiming applicable water quality credits, if appropriate. Treatment control BMPs are not required, since the DCV will be biotreated.
Calculate LID design storm capture volume for Project.	*DCV = C × d × A × 43560 sf/ac × 1/12 in/ft* Where: *DCV* = runoff volume during the design storm event, cu-ft *C* = runoff coefficient = *(0.75 × imp + 0.15)* *imp* = impervious fraction of drainage area (ranges from 0 to 1) *d* = storm depth (inches) *A* = tributary area (acres) DCV = (0.75 x 0.738 + 0.15) x 0.70 in x 2.06 acres x 43560 sf/ac × 1/12 in/ft DCV = 3,682 ft^3

IV.2 SITE DESIGN AND DRAINAGE PLAN

Minimize Impervious Area

Hardscape is minimized on the property where imperviousness is 73.8%. Also, infiltration BMPs will be implemented for the project to offset the site's imperviousness.

Preserve Existing Drainage Patterns

Existing drainage patterns will be preserved as indicated. The site will drain in a westerly direction as in existing conditions.

Disconnect Impervious Areas

Area drain inlets are located within landscape areas. As such, building roof drains will drain to landscaping before collecting into the area drains.

Landscape Design

Drought tolerant plants will be utilized in the project's landscape design.

The design capture volumes (DCV) for each DMA are summarized in the table below. These have been derived utilizing the "Simple Design Capture Volume Sizing Method" in accordance with the TGD. Actual BMP sizing requirements, drawdown, depths, and other design details specific to bioswales (TDG BMP Fact Sheet BIO-2) are provided in Section IV.3.2 below. Locations of DMAs and associated LID and treatment BMPs are identified on the exhibits in Section VI. Additional calculations and TGD Worksheets are provided in Attachment A.

DRAINAGE MANAGEMENT AREAS (DMA's)						
DMA ID	Tributary Drainage Area (ac)	% Imp.	Design Storm Depth (in.)	Design Capture Volume (ft^3)	Design flow rate (cfs)	Tributary LID BMP's
1	2.06 ac	73.8%	0.70	3,682 ft^3	0.33 cfs	Bioswales (BMP BIO-2) Length = 560 ft GPS Coordinates: 33.701389, -117.981389

IV.3 LID BMP SELECTION AND PROJECT CONFORMANCE ANALYSIS

Low Impact Development (LID) BMPs are required in addition to site design measures and source controls to reduce pollutants in storm water discharges. LID BMPs are engineered facilities that are designed to retain or biotreat runoff on the project site. The 4th Term MS4 Storm Water Permit (Order R9-2009-0009) requires the evaluation and use of LID features using the following hierarchy of treatment: infiltration, evapotranspiration, harvest/reuse, and biotreatment.

It has been determined that infiltration is infeasible for the proposed project due to fined-grained and course-grained soils in the upper 8 to 10 feet that are generally not suitable for infiltration.

IV.3.1 Hydrologic Source Controls

Name	Included?
Localized on-lot infiltration	☒
Impervious area dispersion (e.g. roof top disconnection)	☐
Street trees (canopy interception)	☐
Residential rain barrels (not actively managed)	☐
Green roofs/Brown roofs	☐
Blue roofs	☐
Impervious area reduction (e.g. permeable pavers, site design)	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐

IV.3.2 Infiltration BMPs

Name	Included?
Bioretention without underdrains	☒
Rain gardens	☐
Porous landscaping	☐
Infiltration planters	☐
Retention swales	☐
Infiltration trenches	☐
Infiltration basins	☐
Drywells	☒
Subsurface infiltration galleries	☐
French drains	☐
Permeable asphalt	☐
Permeable concrete	☐
Permeable concrete pavers	☐
Other:	☐
Other:	☐

IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs

Name	Included?
All HSCs; *See Section IV.3.1*	☐
Surface-based infiltration BMPs	☐
Biotreatment BMPs	☒
Above-ground cisterns and basins	☐
Underground detention	☐
Other:	☐
Other:	☐

IV.3.4 Biotreatment BMPs

Name	Included?
Bioretention with underdrains	☐
Stormwater planter boxes with underdrains	☐
Rain gardens with underdrains	☐
Constructed wetlands	☐
Vegetated swales	☒
Vegetated filter strips	☐
Proprietary vegetated biotreatment systems	☐
Wet extended detention basin	☐
Dry extended detention basins	☐
Other:	☐
Other:	☐

Q=C x I x A

Q = design flowrate, cfs
C = runoff coefficient = *(0.75 × imp + 0.15)*
imp = impervious fraction of drainage area (ranges from 0 to 1)
i = design intensity (inches)
A = tributary area (acres)

Q = (0.75 x 0.738 + 0.15) x 0.23 in/hr x 2.06 acres

= 0.33 cfs

Swale bottom width:

$b = (Q \times n_{WQ}) / (1.49 \times y^{1.67} \times s^{0.5})$
Where:
b = estimated swale bottom width, ft
Q = design flowrate, cfs
n_{WQ} = Manning's roughness coefficient for shallow flow conditions, use 0.2 unless other information is available
y = design flow depth, ft (not to exceed 4 inches or 0.33 ft)
s = longitudinal slope in flow direction, ft/ft (not to exceed 0.06)

$b = (0.33 \text{ cfs} \times 0.2)/(1.49 \times (0.33 \text{ ft})^{1.67} \times (0.005)^{0.5})$

= 3.98 ft

Calculate the design flow velocity using the following equation:
$V_{WQ} = Q / A_{WQ}$
Where:
V_{WQ} = design flow velocity, fps
Q = design flowrate, cfs
A_{WQ} = by + Zy^2, cross sectional area of flow at design depth
Z = side slope length per unit height

V_{WQ} = 0.33 cfs/(3.27ft x 0.33ft + 2 x $(0.33ft)^2$)
= 0.25 fps

Swale Length:
$L = 60 \times t_{HR} \times V_{WQ}$
Where:
L = swale length, ft
t_{HR} = hydraulic residence time, min (minimum 10 minutes)
V_{WQ} = design flow velocity, fps

L = 60 sec/min x 10 min. x 0.25 fps

= 150 ft

Current swale design length is greater than 150 ft

IV.3.6 Regional/Sub-Regional LID BMPs

Regional/Sub-Regional LID BMPs

IV.3.8 Non-structural Source Control BMPs

Non-Structural Source Control BMPs				
Identifier	**Name**	**Check One**		**If not applicable, state brief reason**
		Included	**Not Applicable**	
N1	Education for Property Owners, Tenants and Occupants	☒	☐	
N2	Activity Restrictions	☒	☐	
N3	Common Area Landscape Management	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	Residential Site
N6	Local Industrial Permit Compliance	☐	☒	Residential Site
N7	Spill Contingency Plan	☐	☒	Residential Site
N8	Underground Storage Tank Compliance	☐	☒	No USTs proposed
N9	Hazardous Materials Disclosure Compliance	☐	☒	No Hazardous Wastes
N10	Uniform Fire Code Implementation	☐	☒	No Hazardous Wastes
N11	Common Area Litter Control	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☐	☒	No loading docks proposed
N14	Common Area Catch Basin Inspection	☒	☐	
N15	Street Sweeping Private Streets and Parking Lots	☒	☐	
N16	Retail Gasoline Outlets	☐	☒	No RGOs proposed.

N1, Education for Property Owners, Tenants and Occupants

Educational materials related to urban runoff can be provided to homeowners (via project owner or HOA) and employees to reduce pollutants from reaching the storm drain system. Examples of environmental awareness materials include, but are not limited to: guidelines for landscaping and gardening, tips for pet care, vehicle cleaning, and proper disposal of household hazardous waste.

N2, Activity Restrictions

Activity restrictions can be developed to restrict activities that have the potential to create adverse impacts on water quality. Activities include but are not limited to: the handling and disposal of

contaminants, trash management and litter control, irrigation and landscaping practices, vehicle and equipment cleaning, fertilizer applications and household waste management practices.

N3, Common Area Landscape Management

Common area landscape management will include minimizing fertilizer and pesticide application, use of slow-release fertilizers, maintenance activities, providing education to homeowners (via project owner and/or HOA), and providing education and training for employees on management of landscape materials and storm water management. Maintenance shall be conducted on a monthly basis at a minimum.

N4, BMP Maintenance

In accordance with the City LIP and OC DAMP, the project owners and/or HOA of the site will be responsible for the implementation and maintenance of each applicable non-structural BMP, as well as scheduling inspections and maintenance of all applicable structural BMP facilities through its landscape contractor and any other necessary maintenance contractors for the project site. In addition, the project owner will be required to verify treatment control BMP implementation and ongoing maintenance through inspection, self-certification, or other equally effective measure. The certification shall verify that, at a minimum, the inspection and maintenance of all structural BMPs has occurred prior to the start of the rainy season, and in accordance with frequencies outlined in the WQMP prepared for the project. Maintenance frequencies are identified in Section V and shall be implemented upon completion of the project.

N11, Common Area Litter Control

Regular litter control for the entire project area shall be performed including trash pick-up on a weekly basis, and sweeping of littered common areas, as performed by the maintenance crew. In addition, pet waste receptacles will be provided throughout the project site where applicable. Proper signage regarding litter will be posted on or near trash receptacles and trash bins will have lids if not covered by canopy.

N12, Employee Training

Employees of the owner and/or HOA, as well as any contractors of the aforementioned entities will require training to ensure that employees are aware of activities that may result in pollutants reaching the storm drain. Training shall be conducted on an annual basis to ensure proper maintenance activities and daily activities are occurring.

N14, Common Area Catch Basin Inspection

Employees of the owner and/or HOA, as well as any contractors of the aforementioned entities will require training to ensure that employees are aware of activities that may result in pollutants reaching the storm drain. Training shall be conducted on an annual basis to ensure proper maintenance activities and daily activities are occurring.

N15, Street Sweeping Private Streets and Parking Lots

Street sweeping of all impervious streets and parking lots performed at a frequency that reduces or prevents sediment and debris from entering receiving waters, monthly at a minimum, and prior to the rainy season.

IV.3.9 Structural Source Control BMPs

Structural Source Control BMPs				
Identifier	**Name**	**Check One**		**If not applicable, state brief reason**
		Included	**Not Applicable**	
S1	Provide storm drain system stenciling and signage	☒	☐	
S2	Design and construct outdoor material storage areas to reduce pollution introduction	☐	☒	No outdoor storage areas.
S3	Design and construct trash and waste storage areas to reduce pollution introduction	☐	☒	No trash enclosures.
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐	
S5	Protect slopes and channels and provide energy dissipation	☐	☒	No slopes or channels.
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)	☐	☒	
S6	Dock areas	☐	☒	No dock areas.
S7	Maintenance bays	☐	☒	No maintenance bays.
S8	Vehicle wash areas	☐	☒	No vehicle wash areas.
S9	Outdoor processing areas	☐	☒	No outdoor process areas.
S10	Equipment wash areas	☐	☒	No equipment wash areas.
S11	Fueling areas	☐	☒	No fueling areas.
S12	Hillside landscaping	☐	☒	No hillsides.
S13	Wash water control for food preparation areas	☐	☒	No food prep areas.
S14	Community car wash racks	☐	☒	No car wash racks.

S1/SD-13, Provide storm drain system stenciling and signage

Storm drain stenciling or signage on all catch basins with the highly visible source control message "No Dumping Drains to Ocean". This includes catch basins and grate inlets near pedestrian areas or drive aisles. Stencils shall be inspected annually and replaced as needed.

S4/SD-12, Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control

Installing and maintaining efficient irrigation systems designed to minimize water by eliminating overspray to hardscape areas and setting irrigation timing and cycle lengths in accordance with water demands, given time of year, weather, and day and night temperatures. Where feasible, includes incorporation of native tolerant species for landscaping, protection of slopes and efficient irrigation. May be used in conjunction with educational materials to homeowners as well as activity restrictions.

IV.4 ALTERNATIVE COMPLIANCE PLAN (IF APPLICABLE)

IV.4.1 Water Quality Credits

Description of Proposed Project				
Project Types that Qualify for Water Quality Credits (Select all that apply):				
☐Redevelopment projects that reduce the overall impervious footprint of the project site.	☐Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface WQ if not redeveloped.		☐ Higher density development projects which include two distinct categories (credits can only be taken for one category): those with more than seven units per acre of development (lower credit allowance); vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2 or those having more than 18 units per acre (greater credit allowance).	
☐ Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g. reduced vehicle trip traffic with the potential to reduce sources of water or air pollution).		☐ Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g. bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned		☐ Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping).
☐Developments with dedication of undeveloped portions to parks, preservation areas and other pervious uses.	☐ Developments in a city center area.	☐ Developments in historic districts or historic preservation areas.	☐ Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories.	☐In-fill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.

Calculation of Water Quality Credits (if applicable)	

IV.4.2 Alternative Compliance Plan Information

Section V Inspection/Maintenance Responsibility for BMPs

It has been determined that The Olson Company shall assume all BMP inspection and maintenance responsibilities for the Tract No. 19157 project.

Contact Name:	Tom Moore
Title:	VP, Operational Planning
Company:	The Olson Company
Address:	3010 Old Ranch Parkway, Suite 100 Seal Beach, CA 90740
Phone:	(562) 682-7422
Email:	Tmoore@theolsonco.com

Should the maintenance responsibility be transferred at any time during the operational life of Tract No. 19157, such as when an HOA or POA is formed for a project, a formal notice of transfer shall be submitted to the City of Huntington Beach at the time responsibility of the property subject to this WQMP is transferred. The transfer of responsibility shall be incorporated into this WQMP as an amendment.

The Owner shall verify BMP implementation and ongoing maintenance through inspection, self-certification, survey, or other equally effective measure. The certification shall verify that, at a minimum, the inspection and maintenance of all structural BMPs including inspection and performance of any required maintenance in the late summer / early fall, prior to the start of the rainy season. A form that may be used to record implementation, maintenance, and inspection of BMPs is included in Attachment B. The O&M Plan will be recorded in the Orange County Clerk-Recorder's Office prior to close-out of grading/building permits.

The City of Huntington Beach may conduct verifications to assure that implementation and appropriate maintenance of structural and non-structural BMPs prescribed within this WQMP is taking place at the project site. The Owner shall retain operations, inspections and maintenance records of these BMPs and they will be made available to the City upon request. All records must be maintained for at least five (5) years after the recorded inspection date for the lifetime of the project. Long term funding for operations and maintenance of BMPs will be generated through HOA fees. Until an HOA is established, the Owner will provide funding for O&M. CC&Rs specifying BMP maintenance requirements of the HOA and annual HOA BMP Inspection and Maintenance budget will be finalized and submitted to the City for final review.

BMP Inspection/Maintenance			
BMP	**Reponsible Party(s)**	**Inspection/ Maintenance Activities Required**	**Minimum Frequency of Activities**
BIOTREATMENT BMPs			
Vegetated Swales (Bioswales)	Owner/ HOA	Inspect as required. Remove trash and debris as required	Every 6 months in the first year, then Annually thereafter.
NON-STRUCTURAL SOURCE CONTROL BMPs			
Education for Property Owners, Tenants and Occupants	Owner/ HOA	Educational materials will be provided to homeowners upon occupancy (see Attachment B).	Annually
Activity Restrictions	Owner/ HOA	Activity and use restrictions will be developed and enforced by the Owner/ HOA through CC&Rs.	Ongoing

BMP Inspection/Maintenance			
BMP	**Reponsible Party(s)**	**Inspection/ Maintenance Activities Required**	**Minimum Frequency of Activities**
Common Area Landscape Management	Owner/ HOA	Maintenance shall be consistent with City requirements, as well as for fertilizer and/or pesticide. Maintenance includes mowing, weeding, and debris removal on a weekly basis. Trimming, replanting and replacement of mulch shall be performed on an as-needed basis. Trimmings, clippings, and other waste shall be properly disposed of off-site in accordance with local regulations. Materials temporarily stockpiled during maintenance activities shall be placed away from water courses and drain inlets.	Monthly
BMP Maintenance	Owner/ HOA	Maintenance of BMPs implemented at the project site shall be performed at the frequency prescribed in this WQMP. Records of inspections and BMP maintenance shall be maintained by the Owner/HOA and documented with the WQMP, and shall be available for review upon request.	Ongoing
Common Area Litter Control	Owner/ HOA	Litter patrol, violations investigation, reporting and other litter control activities shall be performed in conjunction with maintenance activities. Litter collection and removal shall be performed on a weekly basis.	Weekly
BMP Inspection/Maintenance			

BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
Employee Training	Owner/ HOA	The Owner shall educate all new employees/managers on storm water pollution prevention, particularly good housekeeping practices, prior to the start of the rainy season (October 1). Refresher courses shall be conducted annually. Materials that may be used are attached to this WQMP.	Annually
Common Area Catch Basin Inspection	Owner/ HOA	Private catch basin inlets, area drains, swales, curb-and-gutter systems and other drainage systems shall be inspected after each storm event and, when debris is present, cleaned prior to the storm season by October 1st each year.	After each storm event and Annually
Street Sweeping Private Streets and Parking Lots	Owner/ HOA	Private streets and drive aisles must be swept quarterly, including prior to the start of the rainy season (October 1st).	Quarterly
STRUCTURAL SOURCE CONTROL BMPs			
Provide storm drain system stenciling and signage	Owner/ HOA	Private storm drain stencils shall be inspected for legibility, at minimum, once prior to the storm season, no later than October 1st each year. Those determined to be illegible will be re-stenciled as soon as possible.	Annually
Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	Owner/ HOA	In conjunction with routine maintenance activities, verify that landscape design continues to function properly by adjusting properly to eliminate overspray to hardscape areas, and to verify that irrigation timing and cycle lengths are adjusted in accordance with water demands, given time of year, weather, day or nighttime temperatures based on system specifications and local climate patterns.	Monthly

Section VI Site Plan and Drainage Plan

VI.1 Site Plan and Draiange Plan

The exhibits provided in this section are to illustrate the post construction BMPs prescribed within this WQMP. Drainage flow information of the proposed project, such as general surface flow lines, concrete or other surface drainage conveyances, and storm drain facilities are also depicted. All structural source control BMPs are shown as well. Include a site plan and drainage plan sheet set containing the following minimum information:

VI.1.1 Vicinity Map

VI.1.2 Architectural Site Plan

VI.1.3 Grading and Drainage Plan

VI.1.4 Proposed Hydrology Exhibit and WQMP Site Plan

VICINITY MAP

MISC. LEGEND

G - Gas Meters
E - Electrical Cab.
C - Cable/Date Cab.
A/C - Air Condenser Units

Building #	HTOC Near Newland St.	TOS (FF)	Height Difference
1	52.23	48.15	-4.08
2	52.23	47.95	-4.28
3	52.23	47.25	-4.98
4	52.23	47	-5.23
5	52.23	47.45	-4.78
6	52.23	47.35	-4.88
7	52.23	46.65	-5.58
8	52.23	46.5	-5.73
9	52.23	45.85	-6.38

Property Address	**Legal Description**
8371-8375 Talbert Ave. Huntington Beach, CA 92647	Pin No. Assessor : 167-531-23, 24 TTM No. 19157

Building Code Summary	
Occupancy	R-3
Construction Type	Type V-B
Fire Sprinkler	NFPA 13D
Building Type	On-Grade
Number of Stories	2 and 3

Zoning	
Current Zoning	RL- Low Density Residential
Proposed Use	RM- Medium Density Residential
Front Yard Setback	15'
Side Yard Setback	17' (above 2 stories + 3' for exceeding 25' height)
Street Side Yard Setback	15'
Rear Yard Setback	13' (10' + 3' for exceeding 25' height)

Site Summary	**Site Area**		
Gross Site Area	105,889 SF	2.43 AC	
Net Site Area	89,949 SF	2.07 AC	
Dwelling Units*	34 DU	*Density Bonus 10%	
Gross Density	14.0 DU/AC		
Net Density	16.4 DU/AC		

Lot Coverage		
Maximum Lot Coverage	50 %	
Provided Lot Coverage	33 % Provided	

Density		
Permitted Density	15.0 du/ac	
Provided Density	16.4 du/ac	*Density Bonus 10%

Building Height	
Allowed	35'-0"
Proposed	35'-0"

Townhomes Plan Summary	#	GFA	Beds	%	Total GFA	GFA + Garage
P1/P1 alt	4	1,258	3	11.8%	5,032	6,984
P2	7	1,586	3	20.6%	11,102	14,581
P3	14	1,805	4	41.2%	25,270	29,988
P4	9	1,846	3	26.5%	16,614	16,614
Total	34			100.0%	58,018	68,167

Type	#	%
3 bedroom Units	20	58.8%
4 bedroom Units	14	41.2%
Total	**34**	**100%**

Bedroom Count		
Type	#	%
3 bedroom total	60	51.7%
4 bedroom total	56	48.3%
Total	**116**	**100%**

Parking Summary		
Required	Spaces/ Unit	Req.
Resident	2.0	68
Guest	0.50	17
Total Required Parking	**2.5**	**85**

Parking Provided	Spaces/ Unit	Spaces Provided
Garage Spaces	2.0	68
Guest Spaces	0.53	18
Accessible Space	0.03	1
Total Provided Parking	**2.56**	**87**

Open Space Summary		
Required		
Open Space (25% of total net unit SF)	14,505 SF	426.6 SF/UNIT
Open Space Meeting Minimum Code Dimensions		
Common Open Space (min. 10')	7,088 SF	74 %
Private Open Space (min. 6')	2,456 SF	26 %
Total Open Space Meeting Minimum Dimensions	**9,544 SF**	280.7 SF/UNIT
Open Space NOT Meeting Minimum Code Dimensions		
Private Open Space (less than min. 6' - Aprox. Only)	1,777 SF	8.03 %
Other Landscape Space (less than min. 10' - Aprox. Only)	20,346 SF	91.97 %
Total Open Space NOT Meeting Minimum Dimensions	**22,123 SF**	650.7 SF/UNIT
Total of All Open Space Categories	**31,667 SF**	
Building Coverage	29,338 SF	32.62 %
Pavement Coverage	28,944 SF	32.18 %
Landscape/Hardscape Coverage	31,667 SF	35.21 %

ktgy
Architecture + Planning
17911 Von Karman Ave,
Suite 200
Irvine, CA 92614
949.851.2133
ktgy.com

The Olson Company
3010 Old Ranch Parkway, Suite 100
Seal Beach, CA 90704

HUNTINGTON BEACH - NEWLAND AND TALBERT
HUNTINGTON BEACH, CA # 2020-0732

Plot Date: 02.03.2022
4th Planning Submittal: 02.02.2022

0 15 30 60

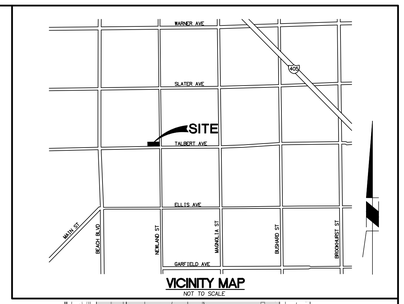
SITE PLAN

A1.0

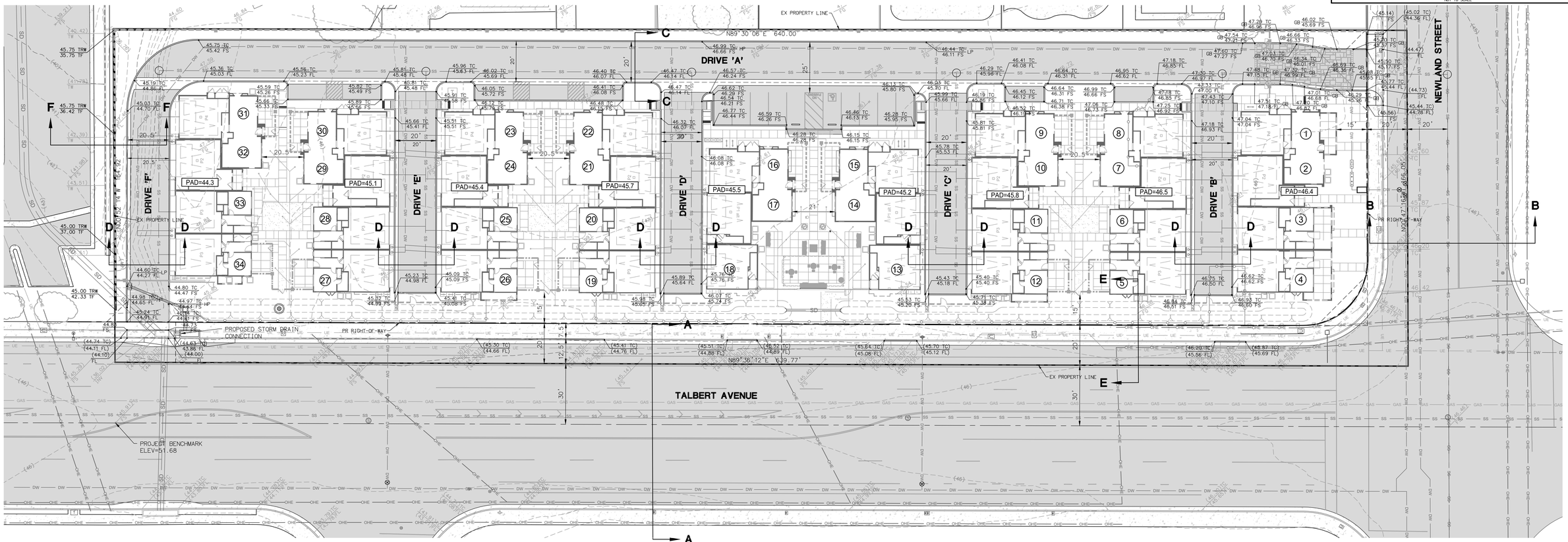
GRADING AND DRAINAGE PLAN
FOR
TENTATIVE TRACT MAP NO. 19157
FOR CONDOMINIUM PURPOSES

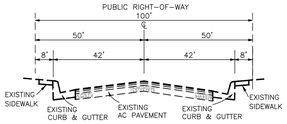
IN THE CITY OF HUNTINGTON BEACH
COUNTY OF ORANGE, STATE OF CALIFORNIA

BEING A SUBDIVISION OF PARCELS 2, 3 AND 4, IN THE CITY OF HUNTINGTON BEACH, COUNTY OF ORANGE, STATE OF CALIFORNIA, AS SHOWN ON A MAP RECORDED IN BOOK 42, PAGE 34 OF PARCEL MAPS, RECORDS OF SAID COUNTY

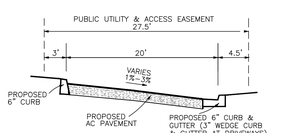


VICINITY MAP
NOT TO SCALE

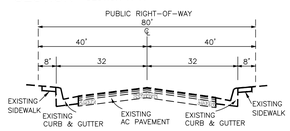




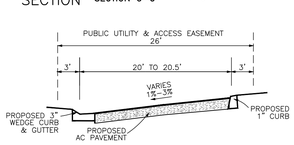
TALBERT AVENUE
SECTION SECTION A-A N.T.S.



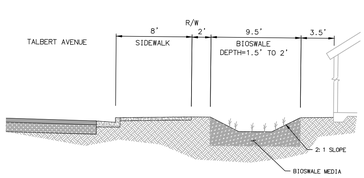
DRIVE "A" (PRIVATE)
SECTION SECTION C-C N.T.S.



NEWLAND STREET
SECTION SECTION B-B N.T.S.



DRIVEWAY "B" – "F" (PRIVATE)
SECTION SECTION D-D N.T.S.

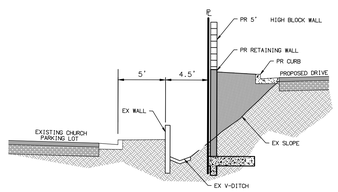


SECTION E-E

LEGEND:

EX TREE
EX SEWER MANHOLE
EX STREETLIGHT
EX FIRE HYDRANT
EX UTILITY BOX
EX STORM DRAIN MANHOLE
EX CATCH BASIN
EX POWER POLE
EX TRAFFIC LIGHT
VAULT EX UNDERGROUND UTILITY VAULT
EX WATER VALVE COVER
EX WATER METER
EX MANHOLE
EX STREET SIGN
EX BOLLARD
EX TRANSFORMER
EX PROPERTY BOUNDARY
EX STREET CENTERLINE
EX RIGHT-OF-WAY
EX PROPERTY LINE
EX MAJOR CONTOUR
EX MINOR CONTOUR
EX SEWER LINE
EX DOMESTIC WATER LINE
EX FIRE WATER LINE
EX RECYCLED WATER LINE
EX STORM DRAIN LINE
EX OVERHEAD ELECTRIC
EX IRON FENCE
EX CHAIN LINK FENCE
EX WOOD FENCE
EX BLOCK WALL
EX RETAINING WALL
EX CURB AND GUTTER
EX CONCRETE
EX BUILDING
EX ASPHALT
1 PR UNIT NUMBER
PLAN 2 PR PLAN NUMBER
PR CURB
PR EDGE OF PAVEMENT

PR SEWER LINE
PR DOMESTIC WATER LINE
PR STORM DRAIN LINE
PR IRON FENCE
PR BLOCK WALL
PR 2:1 SLOPE
PR RETAINING WALL



SECTION F-F

GENERAL NOTES

1. EXISTING LAND USE: (RL) LOW DENSITY RESIDENTIAL
2. PROPOSED LAND USE: 34 TOWNHOMES (RM) MEDIUM DENSITY RESIDENTIAL
3. EXISTING ZONING: (RL) LOW DENSITY RESIDENTIAL
4. WATER SERVICE PROVIDED BY: CITY OF HUNTINGTON BEACH
5. SEWER SERVICE PROVIDED BY: CITY OF HUNTINGTON BEACH
6. ELECTRICAL SERVICE PROVIDED BY: SOUTHERN CALIFORNIA EDISON
7. GAS SERVICE PROVIDED BY: SOCAL GAS CO.
8. TELEPHONE SERVICE PROVIDED BY: AT&T
9. CABLE TELEVISION PROVIDED BY: SPECTRUM
10. PROJECT IS WITHIN THE OCEAN VIEW SCHOOL DISTRICT
11. ALL LOTS SHALL BE HOMEOWNER OR HOMEOWNER ASSOCIATION MAINTAINED
12. NO KNOWN ACTIVE FAULTS ARE KNOWN TO PROJECT THROUGH THE SITE NOR DOES THE SITE LIE WITHIN THE BOUNDARIES OF AN "EARTHQUAKE FAULT ZONE" AS DEFINED BY THE STATE OF CALIFORNIA IN THE ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT.
13. PROPERTY IS LOCATED WITHIN FLOOD ZONE "X", (AREAS OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) PER FIRM PANEL 06059C0253J EFFECTIVE 12/3/2009.
14. ASSESSOR'S PARCEL NUMBER: 167-531-23, 167-531-24
15. PARKING PROVIDED: 68 ENCLOSED (2 PER UNIT IN GARAGE)
    19 GUEST PARKING
16. ALL OPEN SPACE AREAS, DRIVEWAYS, PRIVATE STREETS AND TRACTS WILL BE MAINTAINED BY THE HOA.

LEGAL DESCRIPTION

REAL PROPERTY IN THE CITY OF HUNTINGTON BEACH, COUNTY OF ORANGE, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

PARCEL A: (APN 167-531-24)

PARCELS 2 AND 3, IN THE CITY OF HUNTINGTON BEACH, COUNTY OF ORANGE, STATE OF CALIFORNIA, AS SHOWN ON A MAP RECORDED IN BOOK 42, PAGE 34 OF PARCEL MAPS, RECORDS OF SAID COUNTY.

EXCEPTING THEREFROM THE NORTH 130.00 FEET THEREOF.

PARCEL B: (APN 167-531-23)

PARCEL 4, IN THE CITY OF HUNTINGTON BEACH, COUNTY OF ORANGE, STATE OF CALIFORNIA, AS SHOWN ON A MAP RECORDED IN BOOK 42, PAGE 34 OF PARCEL MAPS, RECORDS OF SAID COUNTY.

EXCEPTING THEREFROM THE NORTH 130.00 FEET THEREOF.

BASIS OF BEARINGS:

CENTERLINE OF CENTRAL AVENUE BEING N 89°19'54" W

PROPERTY ADDRESS:

8371-8375 TALBERT AVENUE
HUNTINGTON BEACH, CA 92646

ASSESSOR PARCEL NUMBER:

APN: 167-531-23
167-531-24

LOT AREA:

GROSS: 2.43 ACRES
NET: 2.07 ACRES

DENSITY CALCULATIONS:

PROPOSED TOWNHOMES: 34 UNITS
NET AREA: 2.07 AC
PROPOSED DENSITY: 16.4 DU/AC

ESTIMATE OF EARTHWORK QUANTITIES:

CUT=2,052 CY FILL=1,742 CY OVEREXCAVATION=10,000 CY
THESE VALUES ARE FOR PLAN CHECK PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY THEIR OWN QUANTITIES PRIOR TO START OF WORK.

SCALE 1"=20'

20 10 0 20 40 60
SCALE: 1"=20'

STATEMENT OF OWNERSHIP:

WE, THE UNDERSIGNED, DO HEREBY STATE THAT WE ARE THE RECORD OWNERS OF THE PROPERTY COMPRISING THIS TENTATIVE TRACT MAP AND THAT WE HAVE CONSENTED TO THE FILING OF SAID MAP.

GORDON A. LANGSTON AND MARY M. LANGSTON, AS TRUSTEES OF THE LANGSTON FAMILY TRUST
8371-8375 TALBERT AVENUE
HUNTINGTON BEACH, CA 92646

BY: _____ DATE: _____

DEVELOPER:

THE OLSON COMPANY
3010 OLD RANCH PARKWAY, SUITE 100
SEAL BEACH, CA 90740-2751
(562) 596-4770

PREPARED BY:

ADVANCED CIVIL GROUP

ADVANCED CIVIL GROUP, INC.
30251 GOLDEN LANTERN
SUITE E, PMB 251
LAGUNA NIGUEL, CA 92677
(866) 338-5778 PHONE
(866) 338-5778 FAX
WWW.ADVANCEDCIVILGROUP.COM

R. STEVEN AUSTIN, PE 2/23/2022
RCE 68795 EXP: 9/30/23 DATE

REGISTERED PROFESSIONAL ENGINEER R. STEVEN AUSTIN No. 68795 Exp 9-30-2023 CIVIL STATE OF CALIFORNIA

PROGRESS PRINT DRAFT

SCALE: 1" = 20'
DATE: 2/23/2022
GROSS AREA: +/- 2.431 AC
CONTOURS: 1 FOOT
TOTAL LOTS: 1 NUMBERED
0 LETTERED
TOTAL UNITS: 34 TOWNHOMES

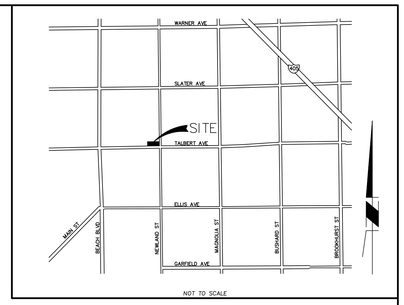
TENTATIVE TRACT MAP NO. 19157
GRADING AND DRAINAGE PLAN
FOR CONDOMINIUM PURPOSES

SHEET 1 OF 1

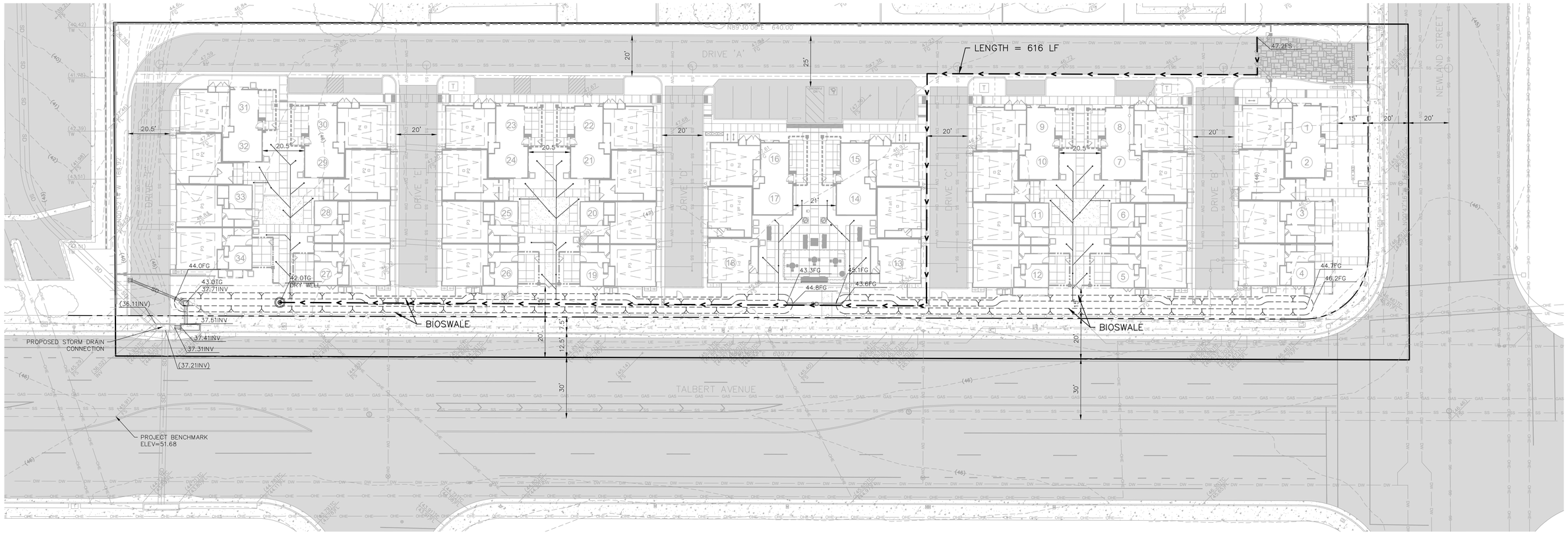
GRADING AND DRAINAGE PLAN
FOR
TENTATIVE TRACT MAP NO. 19157
FOR CONDOMINIUM PURPOSES

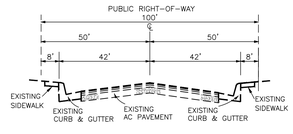
IN THE CITY OF HUNTINGTON BEACH
COUNTY OF ORANGE, STATE OF CALIFORNIA

BEING A SUBDIVISION OF PARCELS 2, 3 AND 4, IN THE CITY OF HUNTINGTON BEACH, COUNTY OF ORANGE, STATE OF CALIFORNIA, AS SHOWN ON A MAP RECORDED IN BOOK 42, PAGE 34 OF PARCEL MAPS, RECORDS OF SAID COUNTY

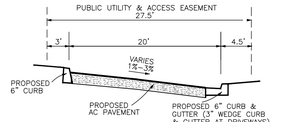


NOT TO SCALE

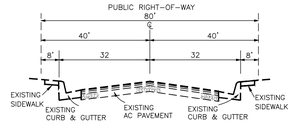




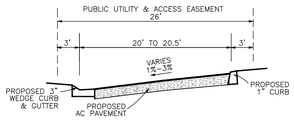
TALBERT AVENUE
SECTION SECTION A-A N.T.S.



DRIVE "A" (PRIVATE)
SECTION SECTION C-C N.T.S.



NEWLAND STREET
SECTION SECTION B-B N.T.S.



DRIVEWAY "B" – "F" (PRIVATE)
SECTION SECTION D-D N.T.S.

SECTION E-E

LEGEND:

EX TREE
EX SEWER MANHOLE
EX STREETLIGHT
EX FIRE HYDRANT
EX UTILITY BOX
EX STORM DRAIN MANHOLE
EX CATCH BASIN
EX POWER POLE
EX TRAFFIC LIGHT
EX UNDERGROUND UTILITY VAULT
EX WATER VALVE COVER
EX WATER METER
EX MANHOLE
EX STREET SIGN
EX BOLLARD
EX TRANSFORMER
EX PROPERTY BOUNDARY
EX STREET CENTERLINE
EX RIGHT-OF-WAY
EX PROPERTY LINE
EX MAJOR CONTOUR
EX MINOR CONTOUR
EX SEWER LINE
EX DOMESTIC WATER LINE
EX FIRE WATER LINE
EX RECYCLED WATER LINE
EX STORM DRAIN LINE
EX OVERHEAD ELECTRIC
EX IRON FENCE
EX CHAIN LINK FENCE
EX WOOD FENCE
EX BLOCK WALL
EX RETAINING WALL
EX CURB AND GUTTER
EX CONCRETE
EX BUILDING
EX ASPHALT
PR UNIT NUMBER
PR PLAN NUMBER
PR CURB
PR EDGE OF PAVEMENT
PR SEWER LINE
PR DOMESTIC WATER LINE
PR STORM DRAIN LINE
PR IRON FENCE
PR BLOCK WALL
PR 2:1 SLOPE
PR RETAINING WALL

GENERAL NOTES

1. EXISTING LAND USE: (RL) LOW DENSITY RESIDENTIAL
2. PROPOSED LAND USE: 34 TOWNHOMES (RM) MEDIUM DENSITY RESIDENTIAL
3. EXISTING ZONING:(RL) LOW DENSITY RESIDENTIAL
4. WATER SERVICE PROVIDED BY: CITY OF HUNTINGTON BEACH
5. SEWER SERVICE PROVIDED BY: CITY OF HUNTINGTON BEACH
6. ELECTRICAL SERVICE PROVIDED BY: SOUTHERN CALIFORNIA EDISON
7. GAS SERVICE PROVIDED BY: SOCAL GAS CO.
8. TELEPHONE SERVICE PROVIDED BY: AT&T
9. CABLE TELEVISION PROVIDED BY: SPECTRUM
10. PROJECT IS WITHIN THE OCEAN VIEW SCHOOL DISTRICT
11. ALL LOTS SHALL BE HOMEOWNER OR HOMEOWNER ASSOCIATION MAINTAINED
12. NO KNOWN ACTIVE FAULTS ARE KNOWN TO PROJECT THROUGH THE SITE NOR DOES THE SITE LIE WITHIN THE BOUNDARIES OF AN "EARTHQUAKE FAULT ZONE" AS DEFINED BY THE STATE OF CALIFORNIA IN THE ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT.
13. PROPERTY IS LOCATED WITHIN FLOOD ZONE "X", (AREAS OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN) PER FIRM PANEL 06059C0253J EFFECTIVE 12/3/2009.
14. ASSESSOR'S PARCEL NUMBER: 167-531-23, 167-531-24
15. PARKING PROVIDED: 68 ENCLOSED (2 PER UNIT IN GARAGE)
    19 GUEST PARKING
16. ALL OPEN SPACE AREAS, DRIVEWAYS, PRIVATE STREETS AND TRACTS WILL BE MAINTAINED BY THE HOA.

LEGAL DESCRIPTION

REAL PROPERTY IN THE CITY OF HUNTINGTON BEACH, COUNTY OF ORANGE, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

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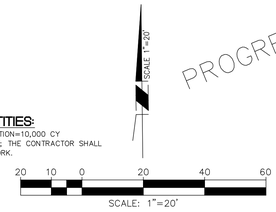

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HUNTINGTON BEACH, CA 92646

BY: _____ DATE: _____

DEVELOPER:

THE OLSON COMPANY
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R. STEVEN AUSTIN, PE
RCE 68795 EXP: 9/30/23

2/23/2022
DATE

REGISTERED PROFESSIONAL ENGINEER
R. STEVEN AUSTIN
No. 68795
Exp 9-30-2023
CIVIL
STATE OF CALIFORNIA

PROGRESS PRINT DRAFT

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TENTATIVE TRACT MAP NO. 19157
HYDROLOGY PLAN
FOR CONDOMINIUM PURPOSES

Attachment A

LID Feasibility Screening and Calculation Worksheets

BIO-2: Vegetated Swale

Also known as:

- *Bioswale*
- *Biofiltration swale*
- *Grass swale*

Vegetated Swale
Source: Geosyntec Consultants

Vegetated swale filters (vegetated swales) are open, shallow channels with low-lying vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. Vegetated swales provide pollutant removal through settling and filtration in the vegetation (usually grasses) lining the channels. In addition, they provide the opportunity for volume reduction through infiltration and ET, and reduce the flow velocity in addition to conveying storm water runoff. Where soil conditions allow, volume reduction in vegetated swales can be enhanced by adding a gravel drainage layer underneath the swale allowing additional flows to be retained and infiltrated. Where slopes are shallow and soil conditions limit or prohibit infiltration, an underdrain system or low flow channel for dry weather flows may be required to minimize ponding and convey treated and/or dry weather flows to an acceptable discharge point. An effective vegetated swale achieves uniform sheet flow through a densely vegetated area for a period of several minutes. The vegetation in the swale can vary depending on its location within the project area and is generally the choice of the designer, subject to the design criteria outlined in this section.

Feasibility Screening Considerations

- Swales may cause incidental infiltration; however, infiltration is not a mandatory mechanism for pollutant removal for swales and it may create hazards in some circumstances. Therefore, conditions should be evaluated to determine whether circumstances require an impermeable liner to avoid infiltration into the subsurface.

Opportunity Criteria

- Open areas are needed for vegetated swales, including, but not limited to, road shoulders, road medians, parks and athletic fields and can be constructed in residential or commercial areas.
- Site slope is less than 10 percent.
- Drainage area is ≤ 5 acres.
- Vegetated swales must not interfere with flood control functions of existing conveyance and detention structures.

OC-Specific Design Criteria and Considerations

☐ Swales should have a minimum bottom width of 2 feet and a maximum bottom width of 10 feet. Swale dividers should be used if the bottom width must exceed 10 feet to promote even distribution of flow across the swale. Local juridictions may require larger minimum widths based on maintenance requirements.

☐ The channel side slope should not exceed 2:1 (H:V) for a total swale depth of 1 foot or less. For deeper swales or mowed grass swales, the maximum channel side slope should be 3:1. Where space is constrained, swales may have vertical concrete or block walls provided that slope

stability, maintenance access and public safety considerations are met.

- ☐ The minimum swale length for biotreatment applications is 100 feet. The minimum residence time for flows in the swale is 10 minutes.
- ☐ If slope is less than 1.5%, underdrains should be provided for the length of the swale
- ☐ A gravel blanket or bedding is required around the underdrain pipe(s). At least 0.5 feet of washed aggregate must be placed below, to the top, and to the sides of the underdrain pipe(s).
- ☐ If an underdrain is included, an amended soil layer of 1 foot minimum thickness must be provided above the underdrain meeting the specifications of MISC-1: Planting/Storage Media.
- ☐ The maximum bed slope in flow direction should not exceed 6% (unles check dams are provided).
- ☐ The maximum flow velocity should not exceed 1.0 ft/sec for water quality treatment swales.
- ☐ For infrequently mowed swales, a maximum flow depth of 4 inches should be implemented. For frequently mowed turf swales, the maximum flow depth is 2 inches.
- ☐ The vegetation height should be maintained between 4 to 6 inches.
- ☐ Gradual meandering bends in the swale are desirable for aesthetic purposes and to promote slower flow and particulate settling.
- ☐ Blockages in the swale that result in uneven flow distribution and points of concentrated flow should be avoided. Blockages that should be avoided include trees, bushes, light pole piers, and utility vaults or pads.

Sizing Method for Vegetated Swales

The Design Capture Method for Flow-based BMPs should be used to determine the design flowrate for a vegetated swale. The user then selects the design flow depth and longitudinal slope and uses the sizing steps below to determine the length and width of the swale. The sizing steps are as follows:

Step 1: Determine Design Flowrate (Q)

Calculate the Design Flowrate (Q) using the Capture Efficiency Method for Flow-based BMPs (See **Appendix III.3.3**). Inputs include the time of concentration of the catchment (T_c) and the capture efficiency achieved upstream by HSCs or other BMPs.

Step 2: Estimate the Swale Bottom Width

For shallow flow depths, channel side slopes can be ignored and the bottom width can be calculated using a simplified form of Manning's formula:

$$b = (Q \times n_{WQ}) / (1.49 \times y^{1.67} \times s^{0.5})$$

Where:

b = estimated swale bottom width, ft

Q = design flowrate, cfs

n_{WQ} = Manning's roughness coefficient for shallow flow conditions, use 0.2 unless other information is available

y = design flow depth, ft (not to exceed 4 inches or 0.33 ft)

s = longitudinal slope in flow direction, ft/ft (not to exceed 0.06)

If b is between 2 and 10 feet, proceed to step 3.

If b is less than 2 feet, increase b to 2 feet and recalculate design flow depth using the following:

$y = ((Q \times n_{WQ}) / (1.49 \times b \times s^{0.5}))^{0.6}$

If b is greater than 10 feet, one of the following steps is necessary:

- Increase longitudinal slope to a maximum of 6% or 0.06, and recalculate b
- Increase design flow depth to a maximum of 4 inches or 0.33 ft, and recalculate b
- Install a divider lengthwise along swale bottom at least three-quarters of the swale length, beginning at the inlet. The swale width can be increased to 16 feet if a divider is provided.

Step 3: Determine Design Flow Velocity

Calculate the design flow velocity using the following equation:

$V_{WQ} = Q / A_{WQ}$

Where:

V_{WQ} = design flow velocity, fps

Q = design flowrate, cfs

$A_{WQ} = by + Zy^2$, cross sectional area of flow at design depth

Z = side slope length per unit height

If the design flow velocity exceeds 1 foot per second, design parameters in Step 2 should be adjusted (slope, bottom width, or design flow depth) until V_{WQ} is equal or less than 1 fps.

Step 4: Calculate Swale Length

Calculate the swale length needed to achieve a minimum hydraulic residence time of 10 minutes using the following equation:

$L = 60 \times t_{HR} \times V_{WQ}$

Where:

L = swale length, ft

t_{HR} = hydraulic residence time, min (minimum 10 minutes)

V_{WQ} = design flow velocity, fps

Step 5: If Needed, Adjust Swale Length to Site Constraints

Note that oftentimes swale length can be accomodated by providing a meandering swale. However, if swale length is too large for the site, the length can be adjusted as follows:

- Calculate the swale treatment top area (A_{top}), based on the swale length calculated in Step 4:

$A_{TOP} = (b_i + b_{SLOPE}) \times L_i$

Where:

A_{TOP} = top area (ft^2) at the design treatment depth

b_i = bottom width (ft), calculated in Step 2

b_{SLOPE} = the additional top width (ft) above the side slope for the design water depth (for 3:1 side slopes and a 4-inch water depth, b_{slope} = 2 feet)

L_i = initial length (ft) calculated in Step 4

- Use the swale top area and a reduced swale length (L_f) to increase the bottom width, using the following equation:

$L_F = A_{TOP} / (b_F + b_{SLOPE})$

Where:

L_F = reduced swale length (ft)

b_F = increased bottom width (ft)

- Recalculate V_{WQ} according to Step 3 using the revised cross-sectional area A_{WQ} based on the increased bottom width (b_F). Revise the design as necessary if the design flow velocity exceeds 1 foot per second.
- Recalculate to ensure that the 10 minute retention time is retained.

Configuration for Use in a Treatment Train

- Vegetated swales can be incorporated in a treatment train to provide enhanced water quality treatment and reductions in runoff volume and rate. For example, if a vegetated swale is placed upgradient of a dry extended detention (ED) basin, the rate and volume of water flowing to the dry ED basin can be reduced and the water quality enhanced. As another example, dry ED basins may be placed upstream a vegetated swale to reduce the size of the vegetated swale.
- Vegetated swales can be used as pretreatment for infiltration BMPs.
- If designed with an infiltration sump, vegetated "bioinfiltration" swales can provide retention and biotreatment capacity.

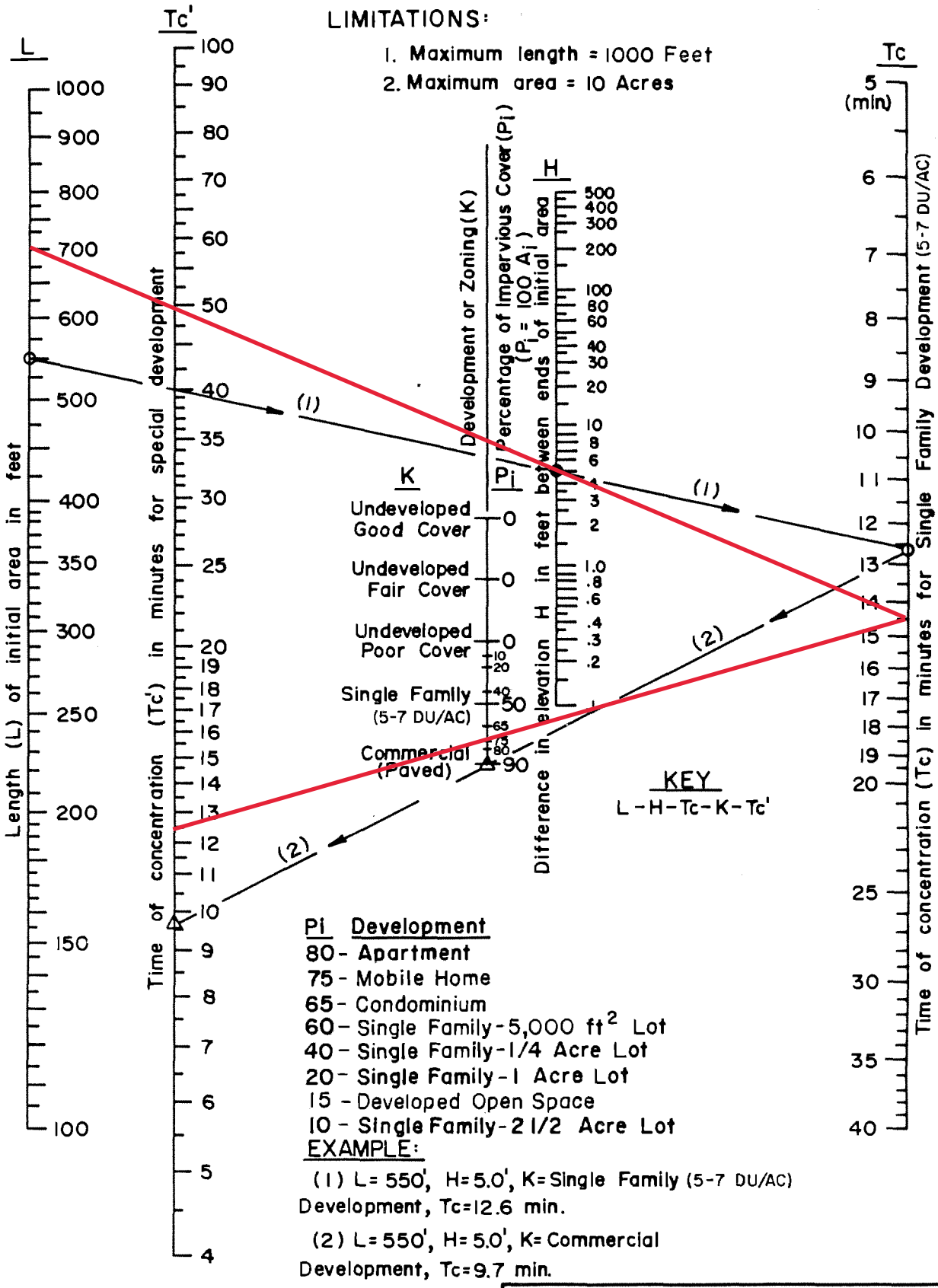
Additional References for Design Guidance

Los Angeles Unified School District (LAUSD) Stormwater Technical Manual, Chapter 4:
http://www.laschools.org/employee/design/fs-studies-and-reports/download/white_paper_report_material/Storm_Water_Technical_Manual_2009-opt-red.pdf?version_id=76975850

Santa Barbara BMP Guidance Manual, Chapter 6:
http://www.santabarbaraca.gov/NR/rdonlyres/91D1FA75-C185-491E-A882-49EE17789DF8/0/Manual_071008_Final.pdf

- County of San Diego Drainage Design Manual for design criteria, Section 5.5:
http://www.co.san-diego.ca.us/dpw/floodcontrol/floodcontrolpdf/drainage-designmanual05.pdf

  County of Los Angeles Low Impact Development Standards Manual, Chapter 5:
http://dpw.lacounty.gov/wmd/LA_County_LID_Manual.pdf
- Los Angeles County Stormwater BMP Design and Maintenance Manual:
http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf



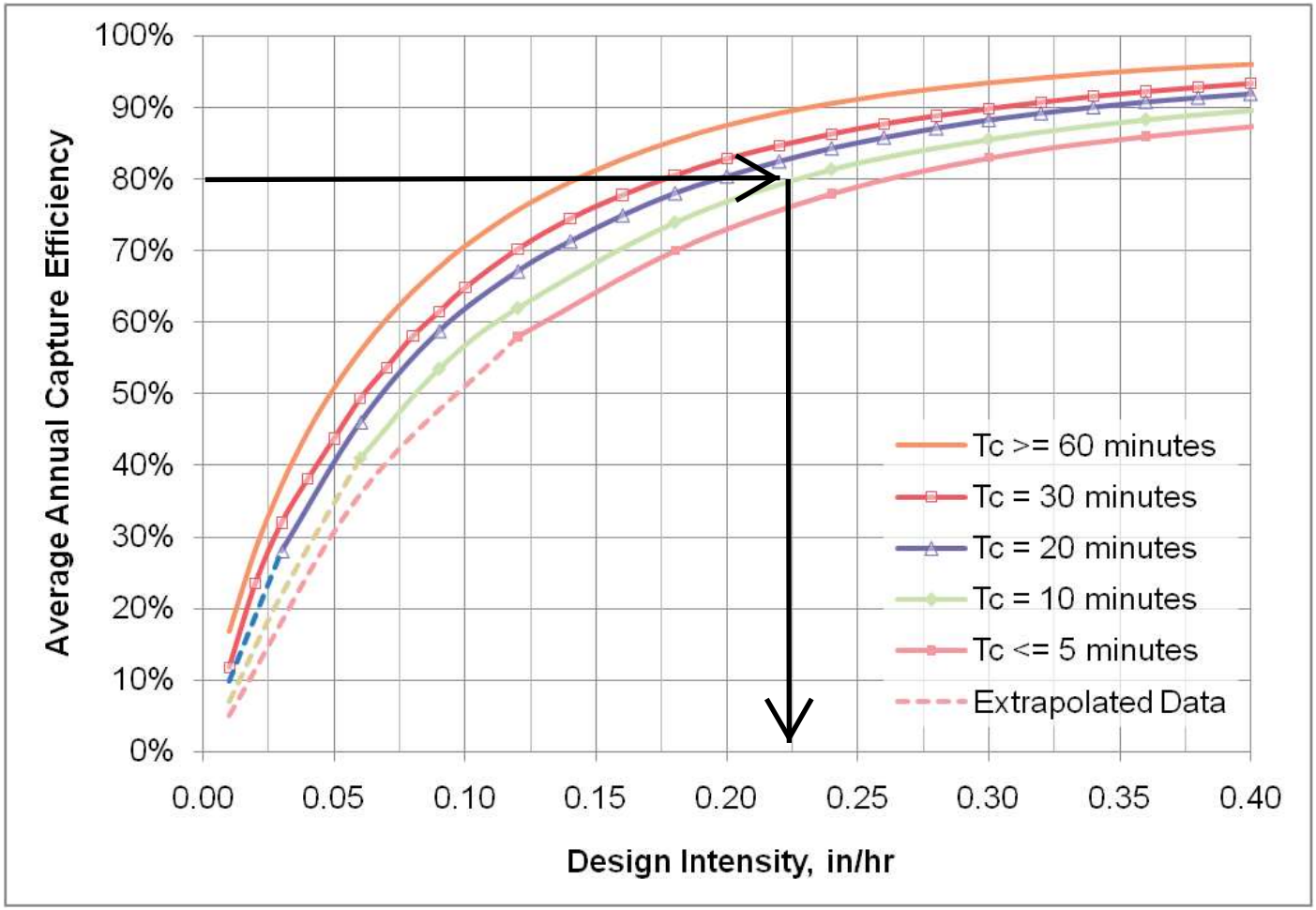
ORANGE COUNTY

HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

Figure III.4. Capture Efficiency Nomograph for Off-line Flow-based Systems in Orange County

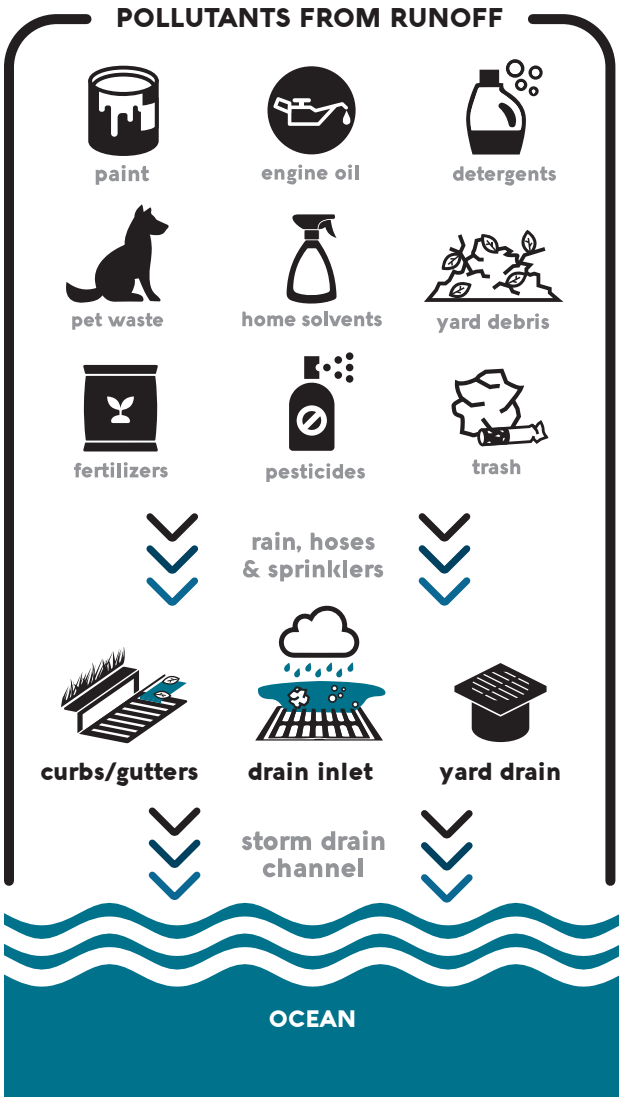


Attachment B

Educational Materials

What Common Pollutants are Found in Runoff?

Common runoff pollutants include trash, pet waste, yard debris, fertilizer, pesticides, engine oil, paint, home solvents, and detergents. Continue reading to learn how these pollutants affect our water resources and what you can do to help.



Who is H_2OC?

H_2OC is YOU! H_2OC is also a cooperative stormwater program which includes all 34 cities in Orange County, the County of Orange, and Orange County Flood Control District. Clean and healthy beaches, creeks, rivers, bays, wetlands, and ocean are important to Orange County. H_2OC provides resources to residents and businesses to prevent water pollution and encourage personal action by working with communities to prevent polluted runoff from entering our waterways. Join us at H2OC.org to learn more about how you can protect local waterways and be the solution to runoff pollution!

Visit

H2OC.org to learn more about runoff, water pollution, and what you can do to protect our water resources!

Contact

24-Hour Pollution Reporting Hotline:
(877) 89-SPILL (77455)
24-Hour Reporting Website:
myOCeServices.ocgov.com

*For more information on household hazardous waste centers go to www.oclandfills.com/hazardous or call (714) 834-4000

**UCCE Master Gardeners: ucceocmghotline@ucanr.edu
mgorange.ucanr.edu/Gardening_Hotline/

YOU ARE THE SOLUTION TO RUNOFF POLLUTION

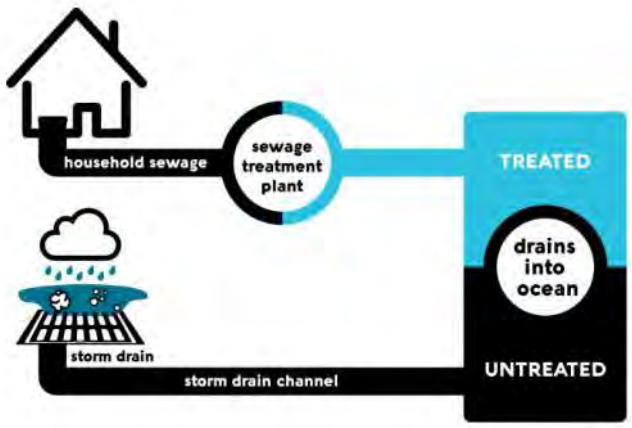
H_2OC STORMWATER PROGRAM

What is Runoff?

Runoff is water from rain and outdoor water use that drains from roofs, driveways, sidewalks, and other surfaces, which does not soak into the ground. As runoff flows over surfaces it will pick up and carry pollutants it encounters, many of which come from waste we produce or mishandle. In Orange County, runoff is captured by storm drains where it flows untreated to the ocean.

Water that flows into storm drains is NOT TREATED

Runoff from homes and businesses may contain pollutants that have harmful effects on downstream creeks, rivers, bays, and ocean. Unlike household sewage, this water is not treated and can negatively impact recreational use, wildlife habitat, and even human health.



TRASH

If trash such as cigarette butts, straws, cups, and other debris enter our waterways, it can create water flow problems and contaminate aquatic habitats. Always properly dispose of waste and recyclables and secure your trash can lid to prevent trash from being released into the environment.

ENGINE OIL

If engine oil enters our waterways, aquatic animals and plants can be negatively affected. It is important to repair leaking vehicles as soon as possible. Clean affected areas utilizing absorbents available at auto and home supply stores. Be sure to follow manufacturer's directions for proper use and disposal of absorbent. Used engine oil can be disposed at a Household Hazardous Waste Center (HHWC*) or where oil was purchased.

PET WASTE

Pet waste is a threat to human and environmental health because it contains harmful bacteria and pathogens. Being a responsible pet owner means picking up after your pet on walks and in your yard, especially before it rains.

YARD DEBRIS

If yard debris reaches local waterways, it can obstruct stormwater flow, clog storm drains, and cause other problems like flooding and erosion. Be sure to collect all debris when doing yard work and properly dispose of it in a green waste bin, or better yet, compost it.

FERTILIZER

If improperly applied, fertilizers can enter our waterways and cause ecological problems. For proper application, follow the manufacturer's instructions and stop applying fertilizers 48 hours before a forecasted rain event.

PESTICIDES

If pesticides, which include herbicides, insecticides, fungicides, and rodenticides, enter our waterways, they can be dangerous to human health and aquatic life. Be sure to limit pesticide use by using nonchemical methods or least-toxic pesticides whenever possible and contact the University of California Cooperative Extension (UCCE) Master Gardeners** with any questions. To properly apply pesticides, follow the manufacturer's instructions and stop applying 48 hours before a forecasted rain event.

PAINT

Paints, and related materials, contain a wide range of chemicals. These products should never be put in storm drains, sewers or septic systems. Instead, dispose of unused paint at your local HHWC*.

DETERGENTS

If phosphorus from detergents enters our waterways, it can cause ecological problems, including fish kills. Additionally, detergents can remove the protective mucous layer from fish, leaving them susceptible to disease. When using detergents for outdoor cleaning projects, do not allow wash water to reach the storm drain system.

HOME SOLVENTS

Many common household cleaning products contain harmful chemicals which are toxic and volatile. If not used and disposed of properly, these chemicals enter our waterways and pose a threat to both human and aquatic life. Always follow the manufacturer's instructions and dispose of the material at your local HHWC*.

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, if we are not careful, our daily activities can lead directly to water pollution problems. Water that drains through your watershed can pick up pollutants which are then transported to our waterways and beautiful ocean.

You can prevent water pollution by taking personal action and by working with members of your watershed community to prevent urban runoff from entering your waterway.

For more information, please call the **Orange County Stormwater Program** at **1.877.89.SPILL** or visit **www.ocwatersheds.com**

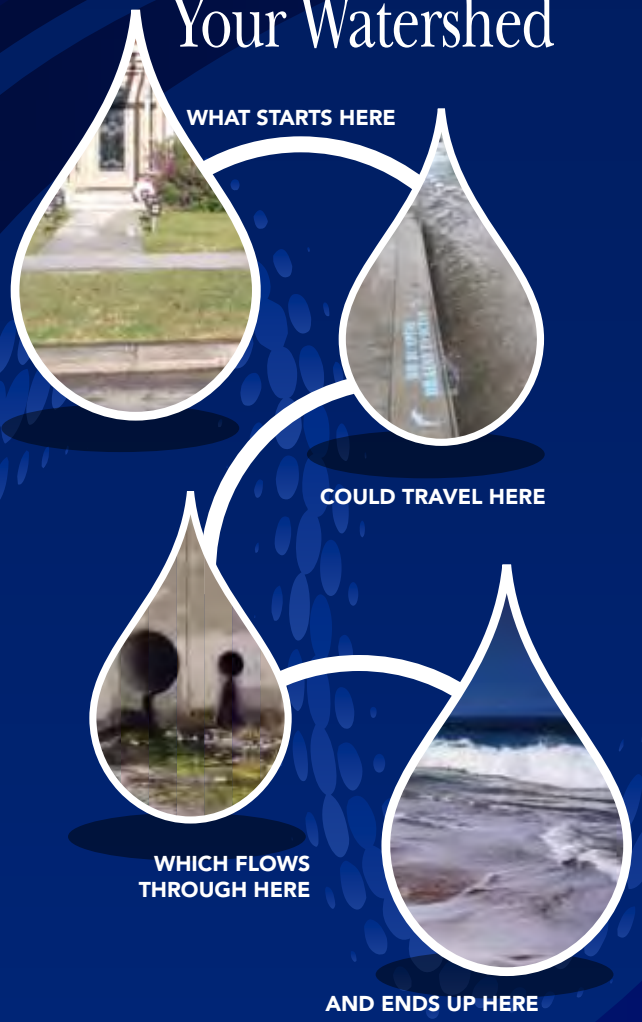
To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1.877.89.SPILL**.

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help protect your watershed. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

Printed on Recycled Paper

Help Prevent Ocean Pollution: Tips For Protecting Your Watershed



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Tips for Protecting Your Watershed

My Watershed. Our Ocean.

Water + shed, *noun: A region of land within which water flows down into a specified water body, such as a river, lake, sea, or ocean; a drainage basin or catchment basin.*

Orange County is comprised of 11 major watersheds into which most of our water flows, connecting all of Orange County to the Pacific Ocean.

As water from rain (stormwater) or sprinklers and hoses (urban runoff) runs down your driveway and into your neighborhood streets, sidewalks and gutters, it flows into storm drains that lead to waterways within your watershed. The waterways from other cities merge as they make their way through our watersheds until all the runoff water in Orange County meets at the Pacific Ocean. The water that reaches our ocean is not pure. As it flows through the watershed, it picks up pollutants such as litter, cigarette butts, fertilizer, pesticides, pet waste, motor oil and lawn clippings. Unlike water that enters the sewer (from sinks and toilets), water that enters the storm drain is not treated before it flows, ultimately, to the ocean.

Water quality can be improved by "Adopting Your Watershed." Through this effort, we are challenging citizens and organizations to join the Orange County Stormwater Program and others who are working to protect and restore our creeks, rivers, bays and ocean.

There are many opportunities to get involved:

- Appreciate your watershed - explore the creeks, trails and ocean and make observations about its conditions. If you see anything abnormal (such as dead fish, oil spills, leaking barrels, and other pollution) contact the Orange County 24-hour water pollution problem reporting hotline at 1.877.89.SPILL to report the problem.
- Research your watershed. Learn about what watershed you live in by visiting www.ocwatersheds.com.
- Find a watershed organization in your community and volunteer to help. If there are no active groups, consider starting your own.
- Visit EPA's Adopt Your Watershed's Catalog of Watershed Groups at www.epa.gov/adopt to locate groups in your community.
- Organize or join in a creek, river, bay or ocean cleanup event such as Coastal & Inner Coastal Cleanup Day that takes place the 3rd Saturday of every September. For more information visit www.coast4u.org.

Follow these simple tips to protect the water quality of your watershed:

- **Sweep up debris and dispose of it in the trash. Do not hose down driveways or sidewalks into the street or gutter.**
- **Use dry cleanup methods such as cat litter to absorb spills and sweep up residue.**
- **Set your irrigation systems to reflect seasonal water needs or use weather-based controllers. Inspect for runoff regularly.**
- **Cover trashcans securely.**
- **Take hazardous waste to a household hazardous waste collection center. (For example, paint, batteries and petroleum products)**
- **Pick up after your pet.**
- **Follow application and disposal directions for pesticides and fertilizers.**
- **If you wash your car at home, wash it on your lawn or divert the runoff onto a landscaped area. Consider taking your car to a commercial car wash, where the water is reclaimed or recycled.**
- **Keep your car well maintained.**
- **Never pour oil or antifreeze in the street, gutter or storm drain.**

Do your part to prevent water pollution in our creeks, rivers, bays and ocean.

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, not properly disposing of household hazardous waste can lead to water pollution. Batteries, electronics, paint, oil, gardening chemicals, cleaners and other hazardous materials cannot be thrown in the trash. They also must never be poured or thrown into yards, sidewalks, driveways, gutters or streets. Rain or other water could wash the materials into the storm drain and eventually into our waterways and the ocean. In addition, hazardous waste must not be poured in the sanitary sewers (sinks and toilets).

NEVER DISPOSE OF HOUSEHOLD HAZARDOUS WASTE IN THE TRASH, STREET, GUTTER, STORM DRAIN OR SEWER.

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit **www.ocwatersheds.com**

To Report Illegal Dumping of Household Hazardous Waste call 1-800-69-TOXIC

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline 1-877-89-SPILL** (1-877-897-7455)**.**

For emergencies, dial 911.

RECYCLE USED OIL

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Help Prevent Ocean Pollution:

Proper Disposal of Household Hazardous Waste

The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

ORANGE COUNTY

Pollution Prevention

Leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients are considered to be "household hazardous waste" or "HHW." HHW can be found throughout your home, including the bathroom, kitchen, laundry room and garage.

WHEN POSSIBLE, USE NON-HAZARDOUS OR LESS-HAZARDOUS PRODUCTS.

Disposal of HHW down the drain, on the ground, into storm drains, or in the trash is illegal and unsafe.

Proper disposal of HHW is actually easy. Simply drop them off at a Household Hazardous Waste Collection Center (HHWCC) for free disposal and recycling. Many materials including anti-freeze, latex-based paint, motor oil and batteries can be recycled. Some centers have a "Stop & Swap" program that lets you take partially used home, garden, and automobile products free of charge. There are four HHWCCs in Orange County:

Anaheim:.....1071 N. Blue Gum St
Huntington Beach:.....17121 Nichols St
Irvine:..... 6411 Oak Canyon
San Juan Capistrano:... 32250 La Pata Ave

Centers are open Tuesday-Saturday, 9 a.m.-3 p.m. Centers are closed on rainy days and major holidays. For more information, call **(714) 834-6752** or visit **www.oclandfills.com.**

Common household hazardous wastes

- Batteries
- Paint and paint products
- Adhesives
- Drain openers
- Household cleaning products
- Wood and metal cleaners and polishes
- Pesticides
- Fungicides/wood preservatives
- Automotive products (antifreeze, motor oil, fluids)
- Grease and rust solvents
- Fluorescent lamps
- Mercury (thermometers & thermostats)
- All forms of electronic waste including computers and microwaves
- Pool & spa chemicals
- Cleaners
- Medications
- Propane (camping & BBQ)
- Mercury-containing lamps
- Television & monitors (CRTs, flatscreens)

Tips for household hazardous waste

- Never dispose of HHW in the trash, street, gutter, storm drain or sewer.
- Keep these materials in closed, labeled containers and store materials indoors or under a cover.
- When possible, use non-hazardous products.
- Reuse products whenever possible or share with family and friends.
- Purchase only as much of a product as you'll need. Empty containers may be disposed of in the trash.
- HHW can be harmful to humans, pets and the environment. Report emergencies to 911.

The Pollution Solution

Several residential activities can result in water pollution. Among these activities are car washing and hosing off driveways and sidewalks. Both activities can waste water and result in excess runoff. Water conservation methods described in this pamphlet can prevent considerable amounts of runoff and conserve water. By taking your car to a commercial car wash and by sweeping driveways and sidewalks, you can further prevent the transport of pollutants to Orange County waterways. Here are some of the common pollutants for which you can be part of the solution:

1 Pesticides and Fertilizer

- **Pollution:** The same pesticides that are designed to be toxic to pests can have an equally lethal impact on our marine life. The same fertilizer that promotes plant growth in lawns and gardens can also create nuisance algae blooms, which remove oxygen from the water and clog waterways when it decomposes.
- **Solution:** Never use pesticides or fertilizer within 48 hours of an anticipated rainstorm. Use only as much as is directed on the label and keep it off driveways and sidewalks.

2 Dirt and Sediment

- **Pollution:** Dirt or sediment can impede the flow of the stormwater and negatively impact stream habitat as it travels through waterways and deposits downstream. Pollutants can attach to sediment, which can then be transported through our waterways.
- **Solution:** Protect dirt stockpiles by covering them with tarps or secure plastic sheets to prevent wind or rain from allowing dirt or sediment to enter the storm drain system.

3 Metals

- **Pollution:** Metals and other toxins present in car wash water can harm important plankton, which forms the base of the aquatic food chain.
- **Solution:** Take your car to a commercial car wash where the wash water is captured and treated at a local wastewater treatment plant.

DID YOU KNOW?

Did you know that most of the pollution found in our waterways is not from a single source, but from a "non-point" source meaning the accumulation of pollution from residents and businesses throughout the community.

4 Pet Waste

- **Pollution:** Pet waste carries bacteria through our watersheds and eventually will be washed out to the ocean. This can pose a health risk to swimmers and surfers.
- **Solution:** Pick up after your pets!

5 Trash and Debris

- **Pollution:** Trash and debris can enter waterways by wind, littering and careless maintenance of trash receptacles. Street sweeping collects some of this trash; however, much of what isn't captured ends up in our storm drain system where it flows untreated out to the ocean.
- **Solution:** Don't litter and make sure trash containers are properly covered. It is far more expensive to clean up the litter and trash that ends up in our waterways than it is to prevent it in the first place. Come out to one of Orange County's many locations for Coastal and Inner-Coastal Cleanup Day, which is held in September.

6 Motor Oil / Vehicle Fluids

- **Pollution:** Oil and petroleum products from our vehicles are toxic to people, wildlife and plants.
- **Solution:** Fix any leaks from your vehicle and keep the maintenance up on your car. Use absorbent material such as cat litter on oil spills, then sweep it up and dispose of it in the trash. Recycle used motor oil at a local Household Hazardous Waste Collection Center.

A TEAM EFFORT

The Orange County Stormwater Program has teamed with the Municipal Water District of Orange County (MWDOC) and the University of California Cooperative Extension Program (UCCE) to develop this pamphlet.

Low Impact Development (LID) and sustainable water use prevents water pollution and conserves water for drinking and reuse. Reducing your water use and the amount of water flowing from your home protects the environment and saves you money.

Thank you for making water protection a priority!

For more information, please visit

Orange County Stormwater Program
www.ocwatersheds.com/publiced/

Municipal Water District of Orange County
www.mwdoc.com

University of California Master Gardeners of Orange County
www.uccemg.com

UC Cooperative Extension OC Water Quality and Water Resources
www.ucanr.org/sites/urbanwatermgmt/

To report a spill, call the Orange County 24-Hour Water Pollution Prevention Reporting Hotline at 1-877-89-SPILL \ (1-877-897-7455)

Special Thanks to
The City of Los Angeles Stormwater Program for the use of its artwork

The Metropolitan Water District of Southern California for the use of the California-Friendly Plant and Native Habitat photos

Homeowners Guide for Sustainable Water Use

Low Impact Development, Water Conservation & Pollution Prevention

The Ocean Begins at Your Front Door

RUNOFF, RAINWATER AND REUSE

Where Does Water Runoff Go?

Stormwater, or water from rainfall events, and runoff from outdoor water use such as sprinklers and hoses flows from homes directly into catch basins and the storm drain system. After entering the storm drain, the water flows untreated into streams, rivers, bays and ultimately the Pacific Ocean. Runoff can come from lawns, gardens, driveways, sidewalks and roofs. As it flows over hard, impervious surfaces, it picks up pollutants. Some pollutants carried by the water runoff include trash, pet waste, pesticides, fertilizer, motor oil and more.

Water Conservation

Pollution not only impairs the water quality for habitat and recreation, it can also reduce the water available for reuse. Runoff allowed to soak into the ground is cleaned as it percolates through the soil, replenishing depleted groundwater supplies. Groundwater provides at least 50% of the total water for drinking and other indoor household activities in north and central Orange County. When land is covered with roads, parking lots, homes, etc., there is less land to take in the water and more hard surfaces over which the water can flow.

In Orange County, 60-70% of water used by residents and businesses goes to irrigation and other outdoor uses. Reusing rainwater to irrigate our lawn not only reduces the impact of water pollution from runoff, but it also is a great way to conserve our precious water resources and replenish our groundwater basin.

What is Low Impact Development (LID)?

Low Impact Development (LID) is a method of development that seeks to maintain the natural hydrologic character of an area. LID provides a more sustainable and pollution-preventative approach to water management.

New water quality regulations require implementation of LID in larger new developments and encourage implementation of LID and other sustainable practices in existing residential areas. Implementing modifications to your lawn or garden can reduce pollution in our environment, conserve water and reduce your water bill.

Permeable pavement allows water runoff to infiltrate through the soil and prevents most pollutants from reaching the storm drain system.

OPTIONS FOR RAINWATER HARVESTING AND REUSE

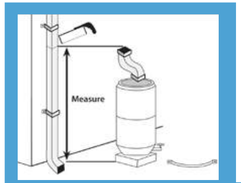
Rainwater harvesting is a great way to save money, prevent pollution and reduce potable water use. To harvest your rainwater, simply redirect the runoff from roofs and downspouts to rain barrels. Rain gardens are another option; these reduce runoff as well as encourage infiltration.

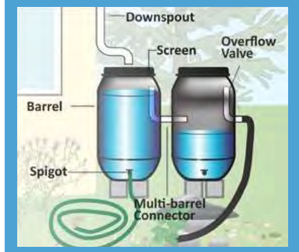
Downspout Disconnection/Redirection

Disconnecting downspouts from pipes running to the gutter prevents runoff from transporting pollutants to the storm drain. Once disconnected, downspouts can be redirected to rain gardens or other vegetated areas, or be connected to a rain barrel.

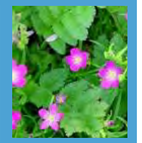
Rain Barrels

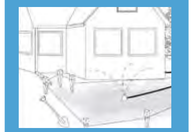
Rain barrels capture rainwater flow from roofs for reuse in landscape irrigation. Capacity of rain barrels needed for your home will depend on the amount of roof area and rainfall received. When purchasing your rain barrel, make sure it includes a screen, a spigot to siphon water for use, an overflow tube to allow for excess water to run out and a connector if you wish to connect multiple barrels to add capacity of water storage.





Mosquito growth prevention is very important when installing a rain barrel. The best way to prevent mosquito breeding is to eliminate entry points by ensuring all openings are sealed tightly. If these methods are unsuccessful, products are available to kill mosquito larvae, but that are harmless to animals and humans. Regular application of these products is essential. Please visit the Orange County Vector Control website for more information at www.ocvcd.org/mosquitoes3.php.





Rain Gardens

Rain gardens allow runoff to be directed from your roof downspout into a landscaped area. Vegetation and rocks in the garden will slow the flow of water to allow for infiltration into the soil. Plants and soil particles will absorb pollutants from the roof runoff. By utilizing a native plant palate, rain gardens can be maintained all year with minimal additional irrigation. These plants are adapted to the semi-arid climate of Southern California, require less water and can reduce your water bill.

Before modifying your yard to install a rain garden, please consult your local building and/or planning departments to ensure your garden plan follows pertinent building codes and ordinances. Besides codes and ordinances, some home owner associations also have guidelines for yard modifications. If your property is in hill areas or includes engineered slopes, please seek professional advice before proceeding with changes.

For information on how to disconnect a downspout or to install and maintain a rain barrel or rain garden at your home, please see the Los Angeles Rainwater Harvesting Program, A Homeowner's "How-To" Guide, November 2009 at www.larainwaterharvesting.org/

OTHER WATER CONSERVATION AND POLLUTION PREVENTION TECHNIQUES

Native Vegetation and Maintenance

"California Friendly" plants or native vegetation can significantly reduce water use. These plants often require far less fertilizers and pesticides, which are two significant pollutants found in Orange County waterways. Replacing water "thirsty" plants and grass types with water efficient natives is a great way to save water and reduce the need for potentially harmful pesticides and fertilizer.

Please see the California Friendly Garden Guide produced by the Metropolitan Water District of Southern California and associated Southern California Water Agencies for a catalog of California friendly plants and other garden resources at www.bewaterwise.com/Gardensoft.

Weed Free Yards

Weeds are water thieves. They often reproduce quickly and rob your yard of both water and nutrients. Weed your yard by hand if possible. If you use herbicides to control the weeds, use only the amount recommended on the label and never use it if rain is forecast within the next 48 hours.

Soil Amendments

Soil amendments such as green waste (e.g. grass clippings, compost, etc.) can be a significant source of nutrients and can help keep the soil near the roots of plants moist. However, they can cause algal booms if they get into our waterways, which reduces the amount of oxygen in the water and impacts most aquatic organisms. It is important to apply soil amendments more than 48 hours prior to predicted rainfall.

IRRIGATE EFFICIENTLY

Smart Irrigation Controllers

Water runoff from sprinklers left on too long will carry pollutants into our waterways.

Smart Irrigation Controllers have internal clocks as well as sensors that will turn off the sprinklers in response to environmental changes. If it is raining, too windy or too cold, the smart irrigation control sprinklers will automatically shut off.

Check with your local water agency for available rebates on irrigation controllers and smart timers.

- Aim your sprinklers at your lawn, not the sidewalk – By simply adjusting the direction of your sprinklers you can save water, prevent water pollution from runoff, keep your lawn healthy and save money.
- Set a timer for your sprinklers – lawns absorb the water they need to stay healthy within a few minutes of turning on the sprinklers. Time your sprinklers; when water begins running off your lawn, you can turn them off. Your timer can be set to water your lawn for this duration every time.
- Water at Sunrise – Watering early in the morning will reduce water loss due to evaporation. Additionally, winds tend to die down in the early morning so the water will get to the lawn as intended.
- Water by hand – Instead of using sprinklers, consider watering your yard by hand. Hand-watering ensures that all plants get the proper amount of water and you will prevent any water runoff, which wastes water and carries pollutants into our waterways.
- Fix leaks - Nationwide, households waste one trillion gallons of water a year to leaks – that is enough water to serve the entire state of Texas for a year. If your garden hose is leaking, replace the nylon or rubber hose washer and ensure a tight connection. Fix broken sprinklers immediately.

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, not properly disposing of used oil is illegal and can lead to fines. If you pour or drain oil onto driveways, sidewalks or streets, it can be washed into the storm drain.

Help prevent water pollution by taking your used oil and oil filters to a used oil collection center. Most major automotive maintenance centers will accept up to five gallons of used motor oil at no cost. For a list of locations, please visit www.cleanup.org.

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL (1-877-897-7455)** or visit **www.ocwatersheds.com.**

For information about the proper disposal of household hazardous waste, call the **Household Waste Hotline** at **1-877-89-SPILL (1-877-897-7455)** or visit **www.oclandfills.com.**

For additional information about the nearest oil recycling center, call the **Used Oil Program** at **1-800-CLEANUP** or visit **www.cleanup.org.**

RECYCLE USED OIL

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Help Prevent Ocean Pollution:

Tips for the Home Mechanic

PROJECT Pollution PREVENTION

The Ocean Begins at Your Front Door

Tips for the Home Mechanic

WORK SITE

- Locate the storm drains on or near your property. Do not allow used oil or any materials to flow into these drains.

- Examine your home for sources of pollution.

- Perform automotive projects under cover and in a controlled area to prevent stormwater runoff.

- Sweep or vacuum your automotive workspace regularly

- Use a damp mop to clean work areas. Never hose down surfaces into the street, gutter or storm drain.

- Pour mop water into a sink or toilet. Never dispose of water in a parking lot, street, gutter or storm drain.

PREVENT LEAKS AND SPILLS

- Keep absorbent materials such as rags and/or cat litter in the work area
- Empty drip pans into a labeled, seal container before they are full
- Wipe up any spills or repair leaks as they happen. Don't let them sit.
- Place large pans under any wrecked cars until all fluids are drained.
- Promptly dispose of collected fluids into a hazardous waste drum or deliver them to an oil recycling center. Used oil recycling locations can be found at http://www.ochealthinfo.com/regulatory/usedoil.htm

CLEANING SPILLS

- Clean up spills immediately by using absorbent material such as rags, cat litter or sand. If the material spilled is hazardous, dispose of the rag, litter or sand in the same manner as hazardous waste. If the material spill is non-hazardous, dispose of it in the trash.

- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at 1-877-89-SPILL (1-877-897-7455) or visit www.ocwatersheds.com to fill out an incident report.

- Report emergencies to 911.

VEHICLE FLUID MANAGEMENT

- Vehicle fluids are hazardous waste and must be stored and disposed of in accordance with all local, state and federal laws.

- Designate an area to drain vehicle fluids away from storm drains and sanitary drains.

- When possible, drain vehicle fluids indoors or within covered areas, and only over floors that are constructed of a non-porous material such as concrete. Asphalt and dirt floors absorb spilled or leaked fluids, making the cleanup extremely difficult.

PROJECT Pollution PREVENTION

Did you know that just one quart of oil can pollute 250,000 gallons of water?

A clean ocean and healthy creeks, rivers, bays and beaches are important to Orange County. However, not properly disposing of used oil can lead to water pollution. If you pour or drain oil onto driveways, sidewalks or streets, it can be washed into the storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering the ocean. Help prevent water pollution by taking your used oil to a used oil collection center.

Included in this brochure is a list of locations that will accept up to five gallons of used motor oil at no cost. Many also accept used oil filters. Please contact the facility before delivering your used oil. This listing of companies is for your reference and does not constitute a recommendation or endorsement of the company.

Please note that used oil filters may not be disposed of with regular household trash. They must be taken to a household hazardous waste collection or recycling center in Anaheim, Huntington Beach, Irvine or San Juan Capistrano. For information about these centers, visit www.oclandfills.com.

Please do not mix your oil with other substances!

For more information, please call the Orange County Stormwater Program at 1-877-89-SPILL (1-877-897-7455) or visit www.watersheds.com.

For information about the proper disposal of household hazardous waste, call the Household Waste Hotline at (714) 834-6752 or visit www.oclandfills.com.

RECYCLE USED OIL

For additional information about the nearest oil recycling center, call the Used Oil Program at 1-800-CLEANUP or visit www.cleanup.org.

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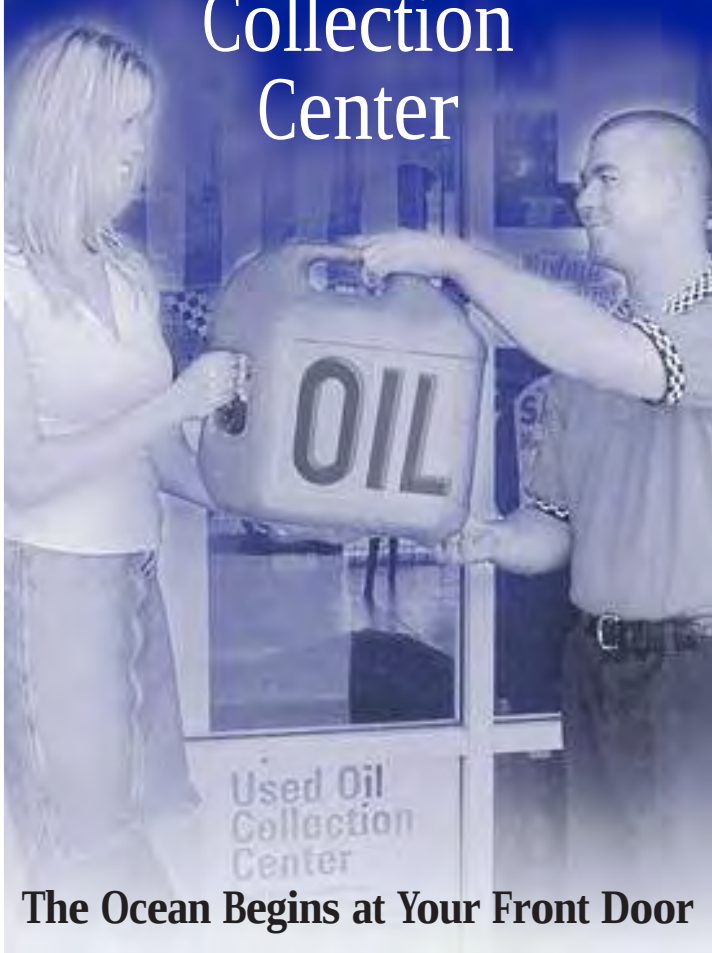
Help Prevent Ocean Pollution:

Recycle at Your Local Used Oil Collection Center



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

NORTH COUNTY

Used Oil Collection Centers

Anaheim

All Seasons Tire and Auto Center, Inc.
817 S Brookhurst St., Anaheim, CA 92804
(714)772-6090( )
CIWMB#: 30-C-03177

AutoZone #3317
423 N Anaheim Blvd., Anaheim, CA 92805
(714)776-0787( )
CIWMB#: 30-C-05263

AutoZone #5226
2145 W Lincoln Ave., Anaheim, CA 92801
(714)533-6599( )
CIWMB#: 30-C-04604

Bedard Automotive
3601 E Miraloma Ave., Anaheim, CA 92806
(714)528-1380( )
CIWMB#: 30-C-02205

Classic Chevrolet
1001 Weir Canyon Rd., Anaheim, CA 92807
(714)283-5400( )
CIWMB#: 30-C-05223

Econo Lube N' Tune #4
3201 W Lincoln Ave., Anaheim, CA 92801
(714)821-0128( )
CIWMB#: 30-C-01485

EZ Lube Inc - Savi Ranch #43
985 N Weir Canyon Rd., Anaheim, CA 92807
(714)556-1312( )
CIWMB#: 30-C-06011

Firestone Store #71C7
1200 S Magnolia Ave., Anaheim, CA 92804
(949)598-5520( )
CIWMB#: 30-C-05743

Great Western Lube Express
125 N Brookhurst St., Anaheim, CA 92801
(714)254-1300( )
CIWMB#: 30-C-05542

HR Pro Auto Service Center
3180 W Lincoln Ave., Anaheim, CA 92801
(714)761-4343( )
CIWMB#: 30-C-05927

Ira Newman Automotive Services
1507 N State College Blvd., Anaheim, CA 92806
(714)635-2392( )
CIWMB#: 30-C-01482

Jiffy Lube #1028
2400 W Ball Rd., Anaheim, CA 92804
(714)761-5211( )
CIWMB#: 30-C-00870

Jiffy Lube #1903
2505 E Lincoln Ave., Anaheim, CA 92806
(714)772-4000( )
CIWMB#: 30-C-05511

Jiffy Lube #2340
2181 W Lincoln Ave., Anaheim, CA 92801
(714)533-1000( )
CIWMB#: 30-C-04647

Kragen Auto Parts #1303
1088 N State College Blvd., Anaheim, CA 92806
(714)956-7351( )
CIWMB#: 30-C-03438

Kragen Auto Parts #1399
2245 W Ball Rd., Anaheim, CA 92804
(714)490-1274( )
CIWMB#: 30-C-04094

Kragen Auto Parts #1565
2072 Lincoln Ave., Anaheim, CA 92806
(714)502-6992( )
CIWMB#: 30-C-04078

Kragen Auto Parts #1582
3420 W Lincoln Ave., Anaheim, CA 92801
(714)828-7977( )
CIWMB#: 30-C-04103

Pep Boys #613
10912 Katella Ave., Anaheim, CA 92804
(714)638-0863( )
CIWMB#: 30-C-01756

Pep Boys #663
3030 W Lincoln Anaheim, CA 92801
(714)826-4810( )
CIWMB#: 30-C-03417

Pep Boys #809
8205 E Santa Ana Cyn Rd., Anaheim, CA 92808
(714)974-0105( )
CIWMB#: 30-C-03443

Pick Your Part
1235 S Beach Blvd., Anaheim, CA 92804
(714)527-1645( )
CIWMB#: 30-C-03744

PK Auto Performance
3106 W. Lincoln Ave., Anaheim, CA 92801
(714)826-2141( )
CIWMB#: 30-C-05628

Quick Change Lube and Oil
2731 W Lincoln Ave., Anaheim, CA 92801
(714)821-4464( )
CIWMB#: 30-C-04363

Saturn of Anaheim
1380 S Auto Center Dr., Anaheim, CA 92806
(714)648-2444( )
CIWMB#: 30-C-06332

Sun Tech Auto Service
105 S State College Blvd., Anaheim, CA 92806
(714)956-1389( )
CIWMB#: 30-C-06455

Vonic Truck Services
515 S Rose St., Anaheim, CA 92805
(714)533-3333( )
CIWMB#: 30-C-01142

Anaheim Hills

Anaheim Hills Car Wash & Lube
5810 E La Palma Ave., Anaheim Hills, CA 92807
(714)777-6605( )
CIWMB#: 30-C-01387

Brea

Firestone Store #27A9
891 E Imperial Hwy., Brea, CA 92821
(714)529-8404( )
CIWMB#: 30-C-01221

Oil Can Henry's
230 N Brea Blvd., Brea, CA 92821
(714)990-1900( )
CIWMB#: 30-C-04273

Buena Park

Firestone Store #71F7
6011 Orangethorpe Buena Park, CA 90620
(714)670-7912( )
CIWMB#: 30-C-01218

Firestone Store #71T8
8600 Beach Blvd., Buena Park, CA 90620
(714)827-5300( )
CIWMB#: 30-C-02121

Kragen Auto Parts #1204
5303 Beach Blvd., Buena Park, CA 90621
(714)994-1320( )
CIWMB#: 30-C-02623

Cypress

AutoZone #5521
5471 Lincoln Ave., Cypress, CA 90630
(714)995-4644( )
CIWMB#: 30-C-00836

Big O Tires
6052 Cerritos Ave., Cypress, CA 90630
(714)826-6334( )
CIWMB#: 30-C-04245

Econo Lube N' Tune #213
5497 Cerritos Ave., Cypress, CA 90630
(714)761-0456( )
CIWMB#: 30-C-06240

Jiffy Lube #851
4942 Lincoln Ave., Cypress, CA 90630
(626)965-9689( )
CIWMB#: 30-C-06182

M & N Coastline Auto & Tire Service
4005 Ball Rd., Cypress, CA 90630
(714)826-1001( )
CIWMB#: 30-C-04387

Masterlube #103
5904 Lincoln Cypress, CA 90630
(714)826-2323( )
CIWMB#: 30-C-01071

Masterlube #104
5971 Ball Rd., Cypress, CA 90630
(714)220-1555( )
CIWMB#: 30-C-04682

Metric Motors of Cypress
6042 Cerritos Ave., Cypress, CA 90630
(714)821-4702( )
CIWMB#: 30-C-05157

Fullerton

AutoZone #2898
146 N. Raymond Ave., Fullerton, CA 92831
(714)870-9772( )
CIWMB#: 30-C-04488

AutoZone #5522
1801 Orangethorpe W. Fullerton, CA 92833
(714)870-8286( )
CIWMB#: 30-C-06062

AutoZone #5523
102 N Euclid Fullerton, CA 92832
(714)870-8286( )
CIWMB#: 30-C-04755

EZ Lube #17
4002 N Harbor Blvd., Fullerton, CA 92835
(714)871-9980( )
CIWMB#: 30-C-03741

Firestone Store #27EH
1933 N Placentia Ave., Fullerton, CA 92831
(714)993-7100( )
CIWMB#: 30-C-02122

Fox Service Center
1018 W Orangethorpe Fullerton, CA 92833
(714)879-1430( )
CIWMB#: 30-C-02318

Fullerton College Automotive Technology
321 E Chapman Ave., Fullerton, CA 92832
(714)992-7275( )
CIWMB#: 30-C-03165

Kragen Auto Parts #0731
2978 Yorba Linda Fullerton, CA 92831
(714)996-4780( )
CIWMB#: 30-C-02628

Kragen Auto Parts #4133
904 W Orangethorpe Ave., Fullerton, CA 92832
(714)526-3570( )
CIWMB#: 30-C-06256

Pep Boys #642
1530 S Harbor Blvd., Fullerton, CA 92832
(714)870-0700( )
CIWMB#: 30-C-01755

Sunnyside 76 Car Care Center
2701 N Brea Blvd., Fullerton, CA 92835
(714)256-0773( )
CIWMB#: 30-C-01381

Garden Grove

76 Pro Lube Plus
9001 Trask Ave., Garden Grove, CA 92844
(714)393-0590( )
CIWMB#: 30-C-05276

AutoZone #5527
13190 Harbor Blvd., Garden Grove, CA 92843
(714)636-5665( )
CIWMB#: 30-C-04760

David Murray Shell
12571 Vly View St., Garden Grove, CA 92845
(714)898-0170( )
CIWMB#: 30-C-00547

Express Lube & Wash
8100 Lampson Ave., Garden Grove, CA 92841
(909)316-8261( )
CIWMB#: 30-C-06544

Firestone Store #7180
10081 Chapman Ave., Garden Grove, CA 92840
(714)530-4630( )
CIWMB#: 30-C-01224

Firestone Store #71W3
13961 Brookhurst St., Garden Grove, CA 92843
(714)590-2741( )
CIWMB#: 30-C-03690

Jiffy Lube #1991
13970 Harbor Blvd., Garden Grove, CA 92843
(714)554-0610( )
CIWMB#: 30-C-05400

Kragen Auto Parts #1251
13933 N Harbor Blvd., Garden Grove, CA 92843
(714)554-3780( )
CIWMB#: 30-C-02663

Kragen Auto Parts #1555
9851 Chapman Ave., Garden Grove, CA 92841
(714)741-8030( )
CIWMB#: 30-C-04079

Nissan of Grarden Grove
9670 Trask Ave., Garden Grove, CA 92884
(714)537-0900( )
CIWMB#: 30-C-06553

Toyota of Garden Grove
9444 Trask Ave., Garden Grove, CA 92844
(714)895-5595( )
CIWMB#: 30-C-06555

La Habra

AutoZone #5532
1200 W Imperial Hwy., La Habra, CA 90631
(562)694-5337( )
CIWMB#: 30-C-04784

Burch Ford
201 N Harbor Blvd., La Habra, CA 90631
(562)691-3225( )
CIWMB#: 30-C-05179

Firestone Store #2736
1071 S Beach Blvd., La Habra, CA 90631
(562)691-1731( )
CIWMB#: 30-C-01169

Kragen Auto Parts #1569
1621 W Whittier Blvd., La Habra, CA 90631
(562)905-2538( )
CIWMB#: 30-C-04076

Pep Boys #997
125 W Imperial Hwy., La Habra, CA 90631
(714)447-0601( )
CIWMB#: 30-C-04026

SpeeDee Oil Change & Tune-Up
1580 W Imperial Hwy., La Habra, CA 90631
(562)697-3513( )

Los Alamitos

Jiffy Lube #1740
3311 Katella Ave., Los Alamitos, CA 90720
(562)596-1827( )
CIWMB#: 30-C-03529

Midway City

Bolsa Transmission
8331 Bolsa Ave., Midway City, CA 92655
(714)799-6158( )
CIWMB#: 30-C-05768

Placentia

Advanced Auto & Diesel
144 S Bradford Placentia, CA 92870
(714)996-8222( )
CIWMB#: 30-C-06242

Castner's Auto Service
214 S. Bradford Ave., Placentia, CA 92870
(714)528-1311( )
CIWMB#: 30-C-06452

Econo Lube N' Tune
100 W Chapman Ave., Placentia, CA 92870
(714)524-0424( )
CIWMB#: 30-C-06454

Fairway Ford
1350 E Yorba Linda Blvd., Placentia, CA 92870
(714)524-1200( )
CIWMB#: 30-C-01863

Seal Beach

M & N Coastline Auto & Tire Service
12239 Seal Beach Blvd., Seal Beach, CA 90740
(714)826-1001( )
CIWMB#: 30-C-04433

Seal Beach Chevron
12541 Seal Beach Blvd., Seal Beach, CA 90740
(949)495-0774(14)
CIWMB#: 30-C-06425

Stanton

AutoZone #2806
11320 Beach Blvd., Stanton, CA 90680
(714)895-7665( )
CIWMB#: 30-C-04563

Joe's Auto Clinic
11763 Beach Blvd., Stanton, CA 90680
(714)891-7715( )
CIWMB#: 30-C-03253

Kragen Auto Parts #1742
11951 Beach Blvd., Stanton, CA 90680
(714)799-7574( )
CIWMB#: 30-C-05231

Scher Tire #20
7000 Katella Ave., Stanton, CA 90680
(714)892-9924( )
CIWMB#: 30-C-05907

USA 10 Minute Oil Change
8100 Lampson Ave., Stanton, CA 92841
(714)373-4432( )
CIWMB#: 30-C-05909

Westminster

AutoZone #5543
6611 Westminster Blvd., Westminster, CA 92683
(714)898-2898( )
CIWMB#: 30-C-04964

AutoZone #5544
8481 Westminster Blvd., Westminster, CA 92683
(714)891-3511( )
CIWMB#: 30-C-04966

City of Westminster Corporate Yard
14381 Olive St., Westminster, CA 92683
(714)895-2876(292)
CIWMB#: 30-C-02008

Honda World
13600 Beach Blvd., Westminster, CA 92683
(714)890-8900( )
CIWMB#: 30-C-03639

Jiffy Lube #1579
6011 Westminster Blvd., Westminster, CA 92683
(714)899-2727( )
CIWMB#: 30-C-02745

John's Brake & Auto Repair
13050 Hoover St., Westminster, CA 92683
(714)379-2088( )
CIWMB#: 30-C-05617

Kragen Auto Parts #0762
6562 Westminster Blvd., Westminster, CA 92683
(714)898-0810( )
CIWMB#: 30-C-02590

Midway City Sanitary District
14451 Cedarwood St., Westminster, CA 92683
(714)893-3553( )
CIWMB#: 30-C-01626

Pep Boys #653
15221 Beach Blvd., Westminster, CA 92683
(714)893-8544( )
CIWMB#: 30-C-03415

Yorba Linda

AutoZone #5545
18528 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)970-8933( )
CIWMB#: 30-C-04971

Econo Lube N' Tune
22270 La Palma Ave., Yorba Linda, CA 92887
(714)692-8394( )
CIWMB#: 30-C-06513

EZ Lube Inc. #41
17511 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)556-1312( )
CIWMB#: 30-C-05739

Firestone Store #27T3
18500 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)779-1966( )
CIWMB#: 30-C-01222

Jiffy Lube #1532
16751 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)528-2800( )
CIWMB#: 30-C-03777

Mike Schultz Import Service
4832 Eureka Ave., Yorba Linda, CA 92886
(714)528-4411( )
CIWMB#: 30-C-04313

This information was provided by the County of Orange Integrated Waste Management Department and the California Integrated Waste Management Board (CIWMB).

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Home improvement projects and work sites must be maintained to ensure that building materials do not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump building materials into the ocean, so don't let them enter the storm drains. Follow these tips to help prevent water pollution.

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit **www.ocwatersheds.com**

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while performing home improvement projects. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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Help Prevent Ocean Pollution:

Tips for Home Improvement Projects

Tips for Home Improvement Projects

Home improvement projects can cause significant damage to the environment. Whether you hire a contractor or work on the house yourself, it is important to follow these simple tips while renovating, remodeling or improving your home:

General Construction

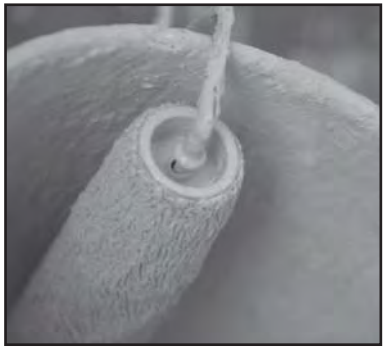
- Schedule projects for dry weather.
- Keep all construction debris away from the street, gutter and storm drain.
- Store materials under cover with temporary roofs or plastic sheets to eliminate or reduce the possibility that rainfall, runoff or wind will carry materials from the project site to the street, storm drain or adjacent properties.

Building Materials

- Never hose materials into a street, gutter or storm drain.
- Exposed piles of construction material should not be stored on the street or sidewalk.
- Minimize waste by ordering only the amount of materials needed to complete the job.
- Do not mix more fresh concrete than is needed for each project.
- Wash concrete mixers and equipment in a designated washout area where the water can flow into a containment area or onto dirt.
- Dispose of small amounts of dry excess materials in the trash. Powdery waste, such as dry concrete, must be properly contained within a box or bag prior to disposal. Call your local trash hauler for weight and size limits.

Paint

- Measure the room or object to be painted, then buy only the amount needed.
- Place the lid on firmly and store the paint can upside-down in a dry location away from the elements.
- Tools such as brushes, buckets and rags should never be washed where excess water can drain into the street, gutter or storm drain. All tools should be rinsed in a sink connected to the sanitary sewer.
- When disposing of paint, never put wet paint in the trash.
- Dispose of water-based paint by removing the lid and letting it dry in the can. Large amounts must be taken to a Household Hazardous Waste Collection Center (HHWCC).



- Oil-based paint is a household hazardous waste. All leftover paint should be taken to a HHWCC.
- For HHWCC locations and hours, call **(714) 834-6752** or visit **www.oclandfills.com**.

Erosion Control

- Schedule grading and excavation projects for dry weather.
- When temporarily removing soil, pile it in a contained, covered area where it cannot spill into the street, or obtain the required temporary encroachment or street closure permit and follow the conditions instructed by the permit.
- When permanently removing large quantities of soil, a disposal location must be found prior to excavation. Numerous businesses are available to handle disposal needs. For disposal options, visit **www.ciwmb.ca.gov/SWIS**.
- Prevent erosion by planting fast-growing annual and perennial grasses. They will shield and bind the soil.

Recycle

- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry (bricks, concrete, etc.), carpet, plastic, pipes (plastic, metal and clay), drywall, rocks, dirt and green waste.

- For a listing of construction and demolition recycling locations in your area, visit **www.ciwmb.ca.gov/recycle.**

Spills

- Clean up spills immediately by using an absorbent material such as cat litter, then sweep it up and dispose of it in the trash.
- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at **1-877-897-7455** or visit **www.ocwatersheds.com** to fill out an incident reporting form.

PROJECT Pollution PREVENTION

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as painting can lead to water pollution if you're not careful. Paint must be used, stored and disposed of properly to ensure that it does not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump paint into the ocean, so don't let it enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while using, storing and disposing of paint. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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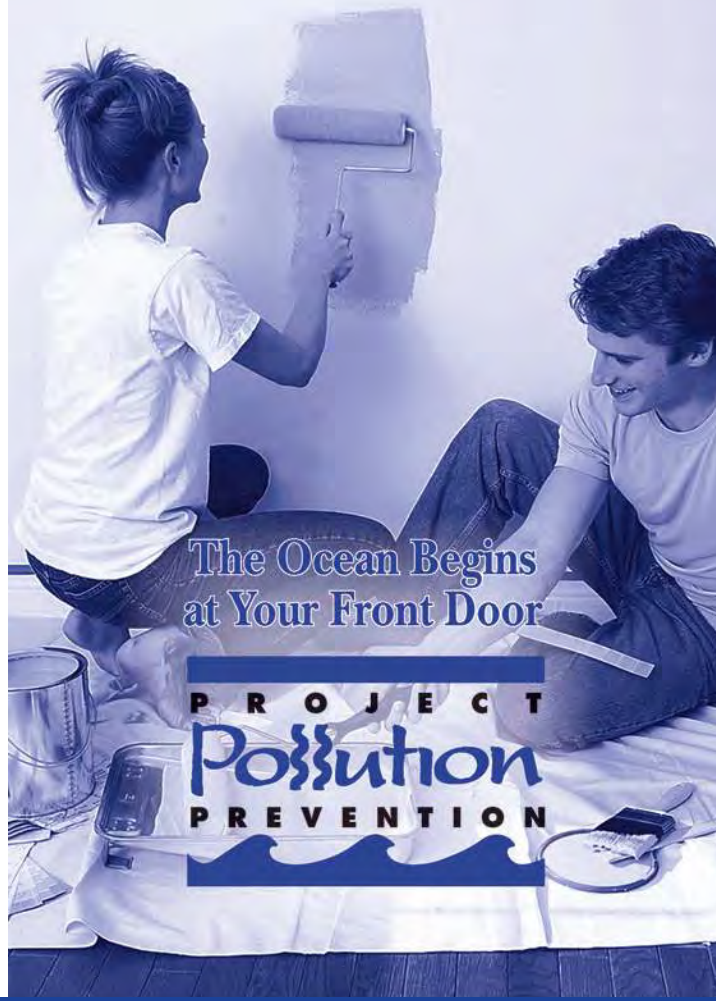
Help Prevent Ocean Pollution:

Tips for Projects Using Paint



Tips for Projects Using Paint

Paint can cause significant damage to our environment. Whether you hire a contractor or do it yourself, it is important to follow these simple tips when purchasing, using, cleaning, storing and disposing of paint.

Purchasing Paint

- Measure the room or object to be painted, then buy only the amount needed.
- Whenever possible, use water-based paint since it usually does not require hazardous solvents such as paint thinner for cleanup.

Painting

- Use only one brush or roller per color of paint to reduce the amount of water needed for cleaning.
- Place open paint containers or trays on a stable surface and in a position that is unlikely to spill.
- Always use a tarp under the area or object being painted to collect paint drips and contain spills.

Cleaning

- Never clean brushes or rinse paint containers in the street, gutter or storm drain.
- For oil-based products, use as much of the paint on the brushes as possible. Clean brushes with thinner. To reuse thinner, pour it through a fine filter (e.g. nylon, metal gauze or filter paper) to remove solids such as leftover traces of paint.
- For water-based products, use as much of the paint on the brushes as possible, then rinse in the sink.
- Collect all paint chips and dust. Chips and dust from marine paints or paints containing lead, mercury or tributyl tin are hazardous waste. Sweep up and dispose of at a Household Hazardous Waste Collection Center (HHWCC).

Storing Paint

- Store paint in a dry location away from the elements.
- Store leftover water-based paint, oil-based paint and solvents separately in original or clearly marked containers.
- Avoid storing paint cans directly on cement floors. The bottom of the can will rust much faster on cement.
- Place the lid on firmly and store the paint can upside-down to prevent air from entering. This will keep the paint usable longer. Oil-based paint is usable for up to 15 years. Water-based paint remains usable for up to 10 years.

Alternatives to Disposal

- Use excess paint to apply another coat, for touch-ups, or to paint a closet, garage, basement or attic.
- Give extra paint to friends or family. Extra paint can also be donated to a local theatre group, low-income housing program or school.
- Take extra paint to an exchange program such as the **"Stop & Swap"** that allows you to drop off or pick up partially used home care products free of charge. **"Stop & Swap"** programs are available at most HHWCCs.
- For HHWCC locations and hours, call **1-877-897-7455** or visit **www.oclandfills.com**.

Disposing of Paint

- Never put wet paint in the trash.

For water-based paint:

- If possible, brush the leftover paint on cardboard or newspaper. Otherwise, allow the paint to dry in the can with the lid off in a well-ventilated area protected from the elements, children and pets. Stirring the paint every few days will speed up the drying.
- Large quantities of extra paint should be taken to a HHWCC.
- Once dried, paint and painted surfaces may be disposed of in the trash. When setting a dried paint can out for trash collection, leave the lid off so the collector will see that the paint has dried.

For oil-based paint:

- Oil-based paint is a household hazardous waste. All leftover paint should be taken to a HHWCC.

Aerosol paint:

- Dispose of aerosol paint cans at a HHWCC.

Spills

- Never hose down pavement or other impermeable surfaces where paint has spilled.
- Clean up spills immediately by using an absorbent material such as cat litter. Cat litter used to clean water-based paint spills can be disposed of in the trash. When cleaning oil-based paint spills with cat litter, it must be taken to a HHWCC.
- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at **1-877-897-7455** or visit **www.ocwatersheds.com** to fill out an incident reporting form.

PROJECT Pollution PREVENTION

Sewage Spill Regulatory Requirements

Allowing sewage to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up efforts.

Here are the pertinent codes, fines, and agency contact information that apply.

Orange County Stormwater Program
24 Hour Water Pollution Reporting Hotline
1-877-89-SPILL (1-877-897-7455)

- County and city water quality ordinances prohibit discharges containing pollutants.

Orange County Health Care Agency Environmental Health
(714) 433-6419

California Health and Safety Code, Sections 5410-5416

- No person shall discharge raw or treated sewage or other waste in a manner that results in contamination, pollution or a nuisance.
- Any person who causes or permits a sewage discharge to any state waters:
  - must immediately notify the local health agency of the discharge.
  - shall reimburse the local health agency for services that protect the public's health and safety (water-contact receiving waters).
  - who fails to provide the required notice to the local health agency is guilty of a misdemeanor and shall be punished by a fine (between $500–$1,000) and/or imprisonment for less than one year.

Regional Water Quality Control Board
Santa Ana Region (951) 782-4130
San Diego Region (858) 467-2952

- Requires the prevention, mitigation, response to and reporting of sewage spills.

California Office of Emergency Services
(800) 852-7550

California Water Code, Article 4, Chapter 4, Sections 13268-13271
California Code of Regulations, Title 23, Division 3, Chapter 9.2, Article 2, Sections 2250-2260

- Any person who causes or permits sewage in excess of 1,000 gallons to be discharged to state waters **shall immediately notify the Office of Emergency Services.**
- Any person who fails to provide the notice required by this section is **guilty of a misdemeanor** and shall be punished by a fine (less than $20,000) and/or imprisonment for not more than one year.

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Sewage Spill
Reference Guide

Your Responsibilities as a Private Property Owner

Residences
Businesses
Homeowner/Condominium Associations
Federal and State Complexes
Military Facilities

Orange County Sanitation District

Health Care Agency
Environmental Health

PROJECT Pollution PREVENTION
www.ocwatersheds.com

This brochure was designed courtesy of the Orange County Sanitation District (OCSD). For additional information, call (714) 962-2411, or visit their website at www.ocsd.com

What is a Sewage Spill?

Sewage spills occur when the wastewater being transported via underground pipes overflows through a manhole, cleanout or broken pipe. Sewage spills can cause health hazards, damage to homes and businesses, and threaten the environment, local waterways and beaches.

Common Causes of Sewage Spills

Grease builds up inside and eventually blocks sewer pipes. Grease gets into the sewer from food establishments, household drains, as well as from poorly maintained commercial grease traps and interceptors.

Structure problems caused by tree roots in the lines, broken/cracked pipes, missing or broken cleanout caps or undersized sewers can cause blockages.

Infiltration and inflow (I/I) impacts pipe capacity and is caused when groundwater or rainwater enters the sewer system through pipe defects and illegal connections.

You Are Responsible for a Sewage Spill Caused by a Blockage or Break in Your Sewer Lines!

Time is of the essence in dealing with sewage spills. You are required to **immediately**:

Control and minimize the spill. Keep spills contained on private property and out of gutters, storm drains and public waterways by shutting off or not using the water.

Use sandbags, dirt and/or plastic sheeting to prevent sewage from entering the storm drain system.

Clear the sewer blockage. Always wear gloves and wash your hands. It is recommended that a plumbing professional be called for clearing blockages and making necessary repairs.

Always notify your city sewer/public works department or public sewer district of sewage spills. If the spill enters the storm drains also notify the Health Care Agency. In addition, if it exceeds 1,000 gallons notify the Office of Emergency Services. Refer to the numbers listed in this brochure.

Overflowing cleanout pipe located on private property

You Could Be Liable

Allowing sewage from your home, business or property to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up and enforcement efforts. See Regulatory Codes & Fines section for pertinent codes and fines that apply.

What to Look For

Sewage spills can be a very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed. Don't dismiss unaccounted-for wet areas.

Look for:

- Drain backups inside the building.
- Wet ground and water leaking around manhole lids onto your street.
- Leaking water from cleanouts or outside drains.
- Unusual odorous wet areas: sidewalks, external walls or ground/landscape around a building.

Caution

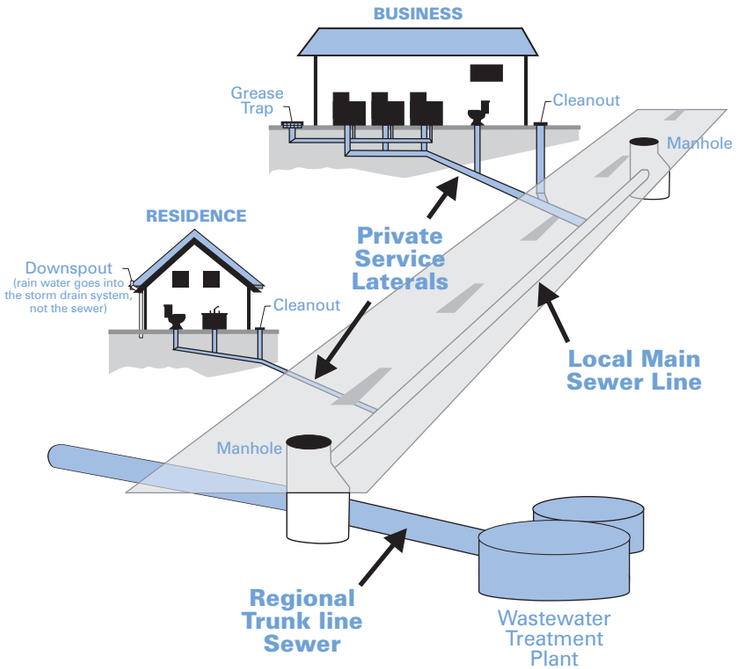
Keep people and pets away from the affected area. Untreated sewage has high levels of disease-causing viruses and bacteria. Call your local health care agency listed on the back for more information.

If You See a Sewage Spill Occurring, Notify Your City Sewer/Public Works Department or Public Sewer District IMMEDIATELY!

How a Sewer System Works

A property owner's sewer pipes are called service laterals and are connected to larger local main and regional trunk lines. Service laterals run from the connection at the home to the connection with the public sewer (including the area under the street). These laterals are the responsibility of the property owner and must be maintained by the property owner. Many city agencies have adopted ordinances requiring maintenance of service laterals. Check with your city sewer/local public works department for more information.

Operation and maintenance of **local and regional sewer lines** are the responsibility of the city sewer/public works departments and public sewer districts.



How You Can Prevent Sewage Spills

1. **Never put grease down garbage disposals, drains or toilets.**
2. **Perform periodic cleaning to eliminate grease, debris and roots in your service laterals.**
3. **Repair any structural problems in your sewer system and eliminate any rainwater infiltration/inflow leaks into your service laterals.**

Preventing Grease Blockages

The drain is not a dump! Recycle or dispose of grease properly and never pour grease down the drain.

Homeowners should mix fats, oils and grease with absorbent waste materials such as paper, coffee grounds, or kitty litter and place it in the trash. Wipe food scraps from plates and pans and dump them in the trash.

Restaurants and commercial food service establishments should always use "Kitchen Best Management Practices." These include:

- Collecting all cooking grease and liquid oil from pots, pans and fryers in covered grease containers for recycling.
- Scraping or dry-wiping excess food and grease from dishes, pots, pans and fryers into the trash.
- Installing drain screens on all kitchen drains.
- Having spill kits readily available for cleaning up spills.
- Properly maintaining grease traps or interceptors by having them serviced regularly. Check your local city codes.

Orange County Agency Responsibilites

- **City Sewer/Public Works Departments—** Responsible for protecting city property and streets, the local storm drain system, sewage collection system and other public areas.
- **Public Sewer/Sanitation District—** Responsible for collecting, treating and disposing of wastewater.
- **County of Orange Health Care Agency—** Responsible for protecting public health by closing ocean/bay waters and may close food-service businesses if a spill poses a threat to public health.
- **Regional Water Quality Control Boards—** Responsible for protecting State waters.
- **Orange County Stormwater Program—** Responsible for preventing harmful pollutants from being discharged or washed by stormwater runoff into the municipal storm drain system, creeks, bays and the ocean.

You Could Be Liable for Not Protecting the Environment

Local and state agencies have legal jurisdiction and enforcement authority to ensure that sewage spills are remedied.

They may respond and assist with containment, relieving pipe blockages, and/or clean-up of the sewage spill, especially if the spill is flowing into storm drains or onto public property.

A property owner may be charged for costs incurred by these agencies responding to spills from private properties.

Report Sewage Spills!

City Sewer/Public Works Departments

Aliso Viejo	(949) 425-2500
Anaheim	(714) 765-6860
Brea	(714) 990-7691
Buena Park	(714) 562-3655
Costa Mesa	(949) 645-8400
Cypress	(714) 229-6760
Dana Point	(949) 248-3562
Fountain Valley	(714) 593-4600
Fullerton	(714) 738-6897
Garden Grove	(714) 741-5375
Huntington Beach	(714) 536-5921
Irvine	(949) 453-5300
Laguna Beach	(949) 497-0765
Laguna Hills	(949) 707-2650
Laguna Niguel	(949) 362-4337
Laguna Woods	(949) 639-0500
La Habra	(562) 905-9792
Lake Forest	(949) 461-3480
La Palma	(714) 690-3310
Los Alamitos	(562) 431-3538
Mission Viejo	(949) 831-2500
Newport Beach	(949) 644-3011
Orange	(714) 532-6480
Orange County	(714) 567-6363
Placentia	(714) 993-8245
Rancho Santa Margarita	(949) 635-1800
San Clemente	(949) 366-1553
San Juan Capistrano	(949) 443-6363
Santa Ana	(714) 647-3380
Seal Beach	(562) 431-2527
Stanton	(714) 379-9222
Tustin	(714) 962-2411
Villa Park	(714) 998-1500
Westminster	(714) 893-3553
Yorba Linda	(714) 961-7170

Public Sewer/Water Districts

Costa Mesa Sanitary District	(714) 393-4433/ (949) 645-8400
El Toro Water District	(949) 837-0660
Emerald Bay Service District	(949) 494-8571
Garden Grove Sanitary District	(714) 741-5375
Irvine Ranch Water District	(949) 453-5300
Los Alamitos/Rossmoor Sewer District	(562) 431-2223
Midway City Sanitary District (Westminster)	(714) 893-3553
Moulton Niguel Water District	(949) 831-2500
Orange County Sanitation District	(714) 962-2411
Santa Margarita Water District	(949) 459-6420
South Coast Water District	(949) 499-4555
South Orange County Wastewater Authority	(949) 234-5400
Sunset Beach Sanitary District	(562) 493-9932
Trabuco Canyon Sanitary District	(949) 858-0277
Yorba Linda Water District	(714) 777-3018

Other Agencies

Orange County Health Care Agency	(714) 433-6419
Office of Emergency Services	(800) 852-7550

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour gardening products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

UCCE Master Gardener Hotline:
(714) 708-1646

To report a spill,
call the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
1-877-89-SPILL (1-877-897-7455)**.**

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while landscaping or gardening. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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Help Prevent Ocean Pollution:

Tips for Landscape & Gardening

The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Tips for Landscape & Gardening

Never allow gardening products or polluted water to enter the street, gutter or storm drain.

General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.
- Plant native vegetation to reduce the amount of water, fertilizers, and pesticide applied to the landscape.

- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.

Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro spray systems. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.

- Use slow-release fertilizers to minimize leaching, and use organic fertilizers.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.

- Rinse empty pesticide containers and re-use rinse water as you would use the product. Do not dump rinse water down storm drains. Dispose of empty containers in the trash.
- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting. For more information, visit **www.ipm.ucdavis.edu**.
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Hazardous Waste Collection Center to be recycled. Locations are provided below.

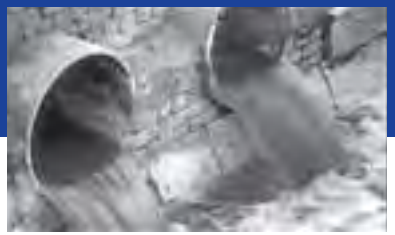
Household Hazardous Waste Collection Centers

Anaheim:	1071 N. Blue Gum St.
Huntington Beach:	17121 Nichols St.
Irvine:	6411 Oak Canyon
San Juan Capistrano:	32250 La Pata Ave.

For more information, call (714) 834-6752 or visit www.oclandfills.com

Clean beaches and healthy creeks, rivers, bays and the Pacific Ocean are important to Orange County. However, many common activities can lead to water pollution if we're not careful. Extra water flowing off lawns can carry fertilizer and pesticides as well as other pollutants from our streets and sidewalks into the storm drains. This polluted water then flows untreated directly into our creeks, rivers, bays and ocean.

You would never intentionally put litter, motor oil, pesticides and fertilizer into the ocean, so don't overwater your lawn, which can carry these pollutants into our waterways. Follow these easy tips to help prevent water pollution.



For More Information, please visit the Orange County Stormwater Program website at ww.ocwatersheds.com

To report a spill,
Call the Orange County 24-hour Water Pollution Problem Reporting Hotline
1-877-89-SPILL (1-877-897-7455)
(For emergencies, dial 911)

The tips contained in this brochure provide useful information about how you can keep excess runoff from carrying pollutants to the storm drain system. Please visit the Orange County Stormwater Program at www.ocwatersheds.com/Publiced for more resources. Other important resources include:

Municipal Water District of Orange County
www.mwdoc.com

University of California Master Gardeners of Orange County
www.uccemg.com

UC Cooperative Extension / OC Water Quality & Water Resources
www.ucanr.org/sites/urbanwatermgmt/

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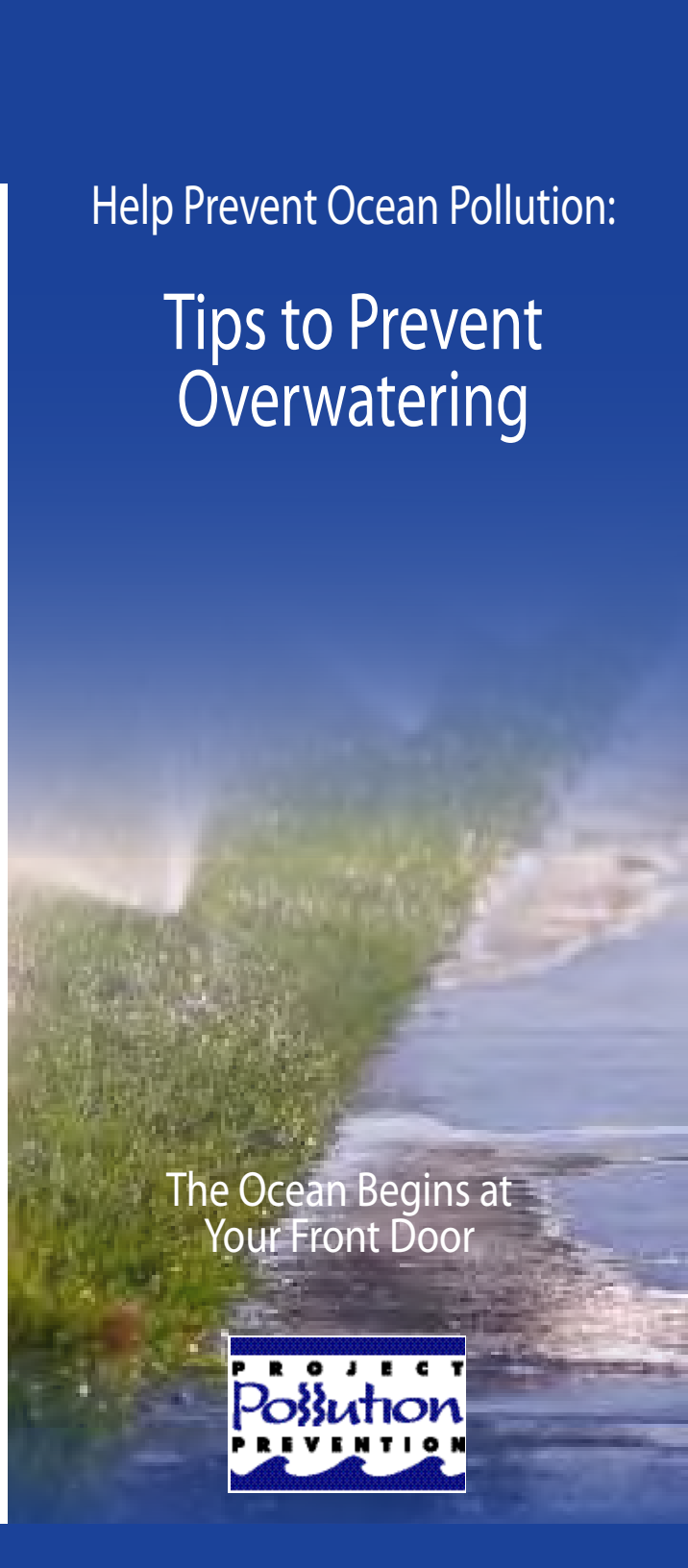
Help Prevent Ocean Pollution:

Tips to Prevent Overwatering



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Tips to Prevent Overwatering

What is Overwatering?

Overwatering is the use of irrigation in exceedance of the water demand of a landscaped area.

In Orange County, 60-70% of water used by residents and businesses goes to irrigation and other outdoor uses. By utilizing water resources more efficiently, more potable water may be available for other uses and will not cause urban runoff.

How Does Overwatering Lead to Pollution?

Even during the hottest summer months, you can often see water runoff going into our storm drains and into our waterways. This runoff is usually the result of overwatering of lawns. The water carries trash, motor oil, pet waste and other pollutants into our storm drains, which flow untreated to the ocean. Water runoff both pollutes our waterways and wastes water.

IT'S THE LAW! If you live in Southern Orange County, runoff from landscape irrigation that enters the street and catch basins is prohibited. Please contact your city for more information about what you can do to prevent overwatering and urban runoff.

Lawn Watering Needs

- During the fall and winter months, your lawn needs far less water than during the summer. Adjust sprinkler controls to water less during winter months.
- If your blades of grass spring up after you step on them, they are adequately watered.
- If your grass is a vibrant green and is not pale, it is receiving enough water. If your lawn becomes less verdant, it may need nutrients and not water. If possible, seek assistance from a gardening professional.
- Overwatering during fall and winter months can saturate soils and lead to lawn disease.

When is the Best Time to Water?

- Watering early in the morning before sunrise will reduce water loss due to evaporation.
- Wind tends to die down in the early morning, so the water will get to the lawn as intended.

How do I Irrigate Most Efficiently?

- Adjust the direction of your sprinkler heads so water does not spray on sidewalks, driveways or roads. By simply adjusting the direction of your sprinklers you can save water, prevent water pollution from runoff and keep your lawn healthy.
- Use an irrigation timer to minimize runoff and maximize water absorption. Water districts often provide irrigation schedules to determine the best water scheme for your yard (e.g. Irvine Ranch Water District Always Water Smart weekly irrigation schedules).
- Consider using smart irrigation controllers. Smart irrigation controllers have internal clocks as well as sensors that will turn off the sprinklers in response to environmental changes. If it is raining, too windy or too cold, the smart irrigation control sprinklers will automatically shut off.
- Consider replacing your sprinkler heads with rotating sprinkler nozzles. Rotating nozzles water more uniformly and efficiently, reducing your outdoor water use by up to 30%.
- Check with your local water agency for available rebates on irrigation controllers and other water efficient devices.
- Water by hand. Instead of using sprinklers, consider watering your yard by hand. Hand-watering ensures that all plants get the proper amount of water and you will prevent any water runoff, which carries pollutants into our waterways and wastes water.

- Fix leaks. Nationwide, households waste one trillion gallons of water a year to leaks. If your garden hose is leaking, replace the nylon or rubber hose washer and ensure a tight connection. Fix broken sprinklers immediately.

Be Careful With Pesticides and Fertilizer

- Never apply pesticides or fertilizer when rain is predicted within the next 48 hours.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed rather than blanketing an entire area.

- Utilize least toxic alternatives to pesticides to manage lawn and garden pests where possible. Pesticides are transported via runoff to waterways and can be harmful to aquatic organisms. Visit www.ipm.ucdavis.edu for more information about pest management practices.

Native Vegetation and Maintenance

- "California Friendly" plants or native vegetation can significantly reduce water use. These plants often require far less fertilizers and pesticides, w hich are two significant pollutants found in Orange County waterways. Replacing water "thirsty" plants and grass types with water efficient natives is a great way to save water and reduce the need for potentially harmful pesticides and fertilizer.
- Please see the California Friendly Garden Guide produced by the Metropolitan Water District of Southern California and associated Southern California Water Agencies for a catalog of California friendly plants and other garden resources at www. bewaterwise.com/Gardensoft.

PROJECT Pollution PREVENTION

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Pet waste and pet care products can be washed into the storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never put pet waste or pet care products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline
1-877-89-SPILL (1-877-897-7455)**.**

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while caring for your pet. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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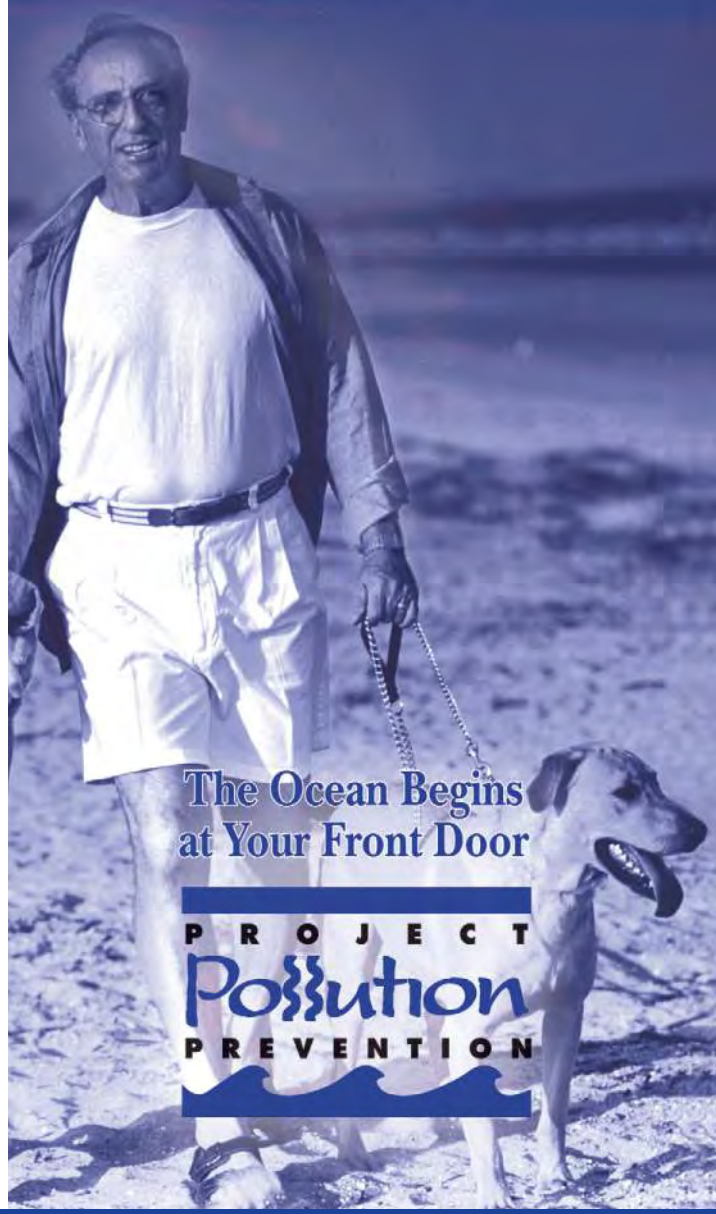
Help Prevent Ocean Pollution:

Tips for Pet Care



Tips for Pet Care

Never let any pet care products or washwater run off your yard and into the street, gutter or storm drain.

Washing Your Pets

Even biodegradable soaps and shampoos can be harmful to marine life and the environment.

- If possible, bathe your pets indoors using less-toxic shampoos or have your pet professionally groomed. Follow instructions on the products and clean up spills.

- If you bathe your pet outside, wash it on your lawn or another absorbent/ permeable surface to keep the washwater from running into the street, gutter or storm drain.

Flea Control

- Consider using oral or topical flea control products.

- If you use flea control products such as shampoos, sprays or collars, make sure to dispose of any unused products at a Household Hazardous Waste Collection Center. For location information, call **(714) 834-6752**.

Why You Should Pick Up After Your Pet

It's the law! Every city has an ordinance requiring you to pick up after your pet. Besides being a nuisance, pet waste can lead to water pollution, even if you live inland. During rainfall, pet waste left outdoors can wash into storm drains. This waste flows directly into our waterways and the ocean where it can harm human health, marine life and the environment.

As it decomposes, pet waste demands a high level of oxygen from water. This decomposition can contribute to killing marine life by reducing the amount of dissolved oxygen available to them.

Have fun with your pets, but please be a responsible pet owner by taking care of them and the environment.

- Take a bag with you on walks to pick up after your pet.

- Dispose of the waste in the trash or in a toilet.

PROJECT Pollution PREVENTION

Attachment C

Public Works Project Implementation Code Requirements

CITY OF HUNTINGTON BEACH

PUBLIC WORKS INTERDEPARTMENTAL COMMUNICATION

PROJECT IMPLEMENTATION CODE REQUIREMENTS

DATE:	JANUARY 6, 2022
PROJECT NAME:	OLSON TOWNHOMES
ENTITLEMENTS	GPA-2021-002, ZMA-2021-001, CUP-2021-004, TTM 19157
PLNG APPLICATION NO.	2021-0084
DATE OF PLANS:	DECEMBER 7, 2021
PROJECT LOCATION:	8371 TALBERT AVENUE
PROJECT PLANNER	RICKY RAMOS, SENIOR PLANNER
PLAN REVIEWER:	STEVE BOGART, SENIOR CIVIL ENGINEER
TELEPHONE/E-MAIL:	714-374-1692 / SBOGART@SURFCITY-HB.ORG
PROJECT DESCRIPTION:	1) GPA FROM RL (RESIDENTIAL LOW DENSITY) TO RM (RESIDENTIAL MEDIUM DENSITY) 2) ZMA FROM RL TO RM 3) TTM TO SUBDIVIDE A +/- 2.1 ACRE SITE FOR CONDOMINIUM PURPOSES 4) CUP TO DEVELOP 34 ATTACHED, TWO- AND THREE-STORY TOWNHOMES UP TO 35 FT. TALL WITH A DENSITY BONUS 5) EA TO ANALYZE THE POTENTIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT. THE SITE IS CURRENTLY IMPROVED WITH THREE SINGLE-FAMILY DETACHED RESIDENCES THAT ARE HISTORIC STRUCTURES RATED 3CS IN THE 2014 HISTORIC CONTEXT AND SURVEY REPORT.

The following is a list of code requirements deemed applicable to the proposed project based on plans as stated above. The items below are to meet the City of Huntington Beach's Municipal Code (HBMC), Zoning and Subdivision Ordinance (ZSO), Department of Public Works Standard Plans (Civil, Water and Landscaping) and the American Public Works Association (APWA) Standards Specifications for Public Works Construction (Green Book), and the Orange County Drainage Area management Plan (DAMP). The list is intended to assist the applicant by identifying requirements which shall be satisfied during the various stages of project permitting, implementation and construction. If you have any questions regarding these requirements, please contact the Plan Reviewer or Project Planner.

THE FOLLOWING SITE PLAN REVIEW COMMENTS SHALL BE ADDRESSED PRIOR TO ISSUANCE OF A GRADING PERMIT:

1. Project access vehicle stacking shall queue on-site and not encroach into the public right-of-way.

THE SUBMITTED TENTATIVE TRACT MAP NO. 19157, DATED DECEMBER 7, 2021, SHOULD BE DEEMED INCOMPLETE AND THE FOLLOWING COMMENTS ARE PROVIDED BY PUBLIC WORKS WHICH SHALL BE ADDRESSED PRIOR TO RESUBMITTAL TO THE CITY FOR FURTHER REVIEW WITH RESPECT TO THE PROJECT ENTITLEMENTS:

2. All easements shown in the Preliminary Title Report prepared by Fidelity National Title Company shall be clearly identified on the subject map and it shall be clarified whether each easement will remain or be vacated.
3. All proposed elevation information (i.e. spot elevations, FF and Pad elevations, slopes, grades, etc.) shall be removed from sheet 1 of the subject TTM. These items should be shown on the Preliminary Grading Plan for the project.
4. Remove all references to the “spike & washer” benchmark from Sheet 1 of this TTM. A record benchmark from the OC Surveyor’s Vertical Control Database shall be used for this project and shall be referenced on the Preliminary Grading Plan for the project.
5. All proposed buildings, onsite hardscape improvements and water quality improvements shall be removed from Sheet 1 of the TTM. These items should be shown on the Preliminary Grading and Drainage Plan for the project.
6. Sheet 1 of the TTM shall include only the existing boundary lines, underlying parcels, existing easements and existing boundary conditions that affect the subject property.
7. A Sheet 2 for the subject TTM shall show the proposed parcel(s) with respect to the subject property.
8. Remove the term “VESTING” from the Statement of Ownership on the subject TTM.
9. On the Preliminary Grading and Drainage Plan, the proposed bioswale as shown in Section E-E shall include a 2-foot wide level area behind the public right-of-way line.
10. A Preliminary Water Quality Management Plan shall be submitted for Public Works review.

TENTATIVE TRACT MAP

THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO RECORDATION OF THE FINAL TRACT MAP UNLESS OTHERWISE STATED. BONDING MAY BE SUBSTITUTED FOR CONSTRUCTION IN ACCORDANCE WITH PROVISIONS OF THE SUBDIVISION MAP ACT:

11. The following shall be shown as a dedication to the City of Huntington Beach on the Final Tract Map. (ZSO 230.84A & 253.10K)
    a. A blanket easement over the private street, sidewalk, and access ways for Police Department and Fire Department access.
12. A Hydrology and Hydraulic analysis shall be submitted for Public Works review and approval (10, 25, and 100-year storms shall be analyzed as applicable). The drainage improvements shall be designed and constructed as required by the Department of Public Works to mitigate impact of increased runoff

due to development, or deficient, downstream systems. Design of all necessary drainage improvements shall provide mitigation for all rainfall event frequencies up to a 100-year frequency. Runoff shall be limited to existing 25-year flows, which must be established in the hydrology study. If the analyses shows that the City's current drainage system cannot meet the volume needs of the project runoff, the developer shall be required to attenuate site runoff to an amount not to exceed the existing 25-year storm as determined by the hydrology study. As an option, the developer may choose to explore low-flow design alternatives, onsite attenuation or detention, or upgrade the City's storm drain system to accommodate the impacts of the new development, at no cost to the City. (ZSO 230.84) The study shall also justify final pad elevations on the site in conformance with the latest FEMA requirements and City Standard Plan No. 300. (ZSO 255.04)

13. A sewer study to verify capacity within the City's sanitary sewer system shall be prepared and submitted to Public Works for review and approval. A fourteen (14)-day or longer flow test data shall be included in the study. The location and number of monitoring sites shall be determined by the Public Works Department. (ZSO 230.84/MC 14.36.010)

14. The applicant shall prepare a Traffic Impact Analysis for the project for Public Works review and approval. Support for the project access from Newland Street pending traffic analysis results. Contact Public Works staff to discuss scope of work prior to preparation of traffic analysis.

15. Confirmation from the Orange County Sanitation District (OCSD), to accept the discharge from the new development into the existing OCSD sewer, shall be obtained. A copy shall be provided to the City of Huntington Beach Public Works Department.

16. A qualified, Licensed Engineer shall prepare a detailed soils and geotechnical analysis. This analysis shall include Phase II Environmental on-site soil sampling in areas not previously investigated and laboratory testing of materials to provide detailed recommendations for grading, chemical and fill properties, liquefaction, foundations, landscaping, dewatering, ground water, retaining walls, pavement sections and utilities. (ZSO 251.06 & 253.12)

17. The grading, utility and improvement plans shall be submitted to the Department of Public Works for review and approval. The engineer shall submit cost estimates for determining bond amounts. (ZSO 255.16C & MC 17.05)

18. A Homeowners' Association(s) (HOA) shall be formed and described in the CC&R's to manage the following for the total project area:

    a. On-site private street, accessways and sidewalks
    b. On-site private water system and appurtenances.
    c. Onsite landscaping and irrigation improvements
    d. On-site private sewer system and appurtenances.
    e. On-site private storm drain system and appurtenances including all pumps.
    f. Best Management Practices (BMP's as per the approved Water Quality Management Plan (WQMP)

    The aforementioned items shall be addressed in the development's CC&R's.

19. If the project is developed in phases, then a phasing map shall be submitted for approval by the Planning, Public Works and Fire Departments showing improvements to be constructed. All required infrastructures including all public streets shall be designed with the first phase. The phasing plan shall include public improvements including the park site, construction employee parking, model home locations and access to the model homes, utility relocation, material location, and fire access. (ZSO 253.12L)

20. A reproducible Mylar copy and a print of the recorded final tract map shall be submitted to the Department of Public Works at the time of recordation.
21. The engineer or surveyor preparing the final map shall comply with Sections 7-9-330 and 7-9-337 of the Orange County Subdivision Code and Orange County Subdivision Manual, Subarticle 18 for the following item:
    a. Tie the boundary of the map into the Horizontal Control System established by the County Surveyor.
    b. Provide a digital-graphics file of said map to the County of Orange.
22. Provide a digital-graphics file of said map to the City per the following design criteria:
    a. Design Specification:
        i. Digital data shall be full size (1:1) and in compliance with the California coordinate system – STATEPLANE Zone 6 (Lambert Conformal Conic projection), NAD 83 datum in accordance with the County of Orange Ordinance 3809.
        ii. Digital data shall have double precision accuracy (up to fifteen significant digits).
        iii. Digital data shall have units in US FEET.
        iv. A separate drawing file shall be submitted for each individual sheet.
        v. Digital data shall be in compliance with the Huntington Beach Standard Sheets, drawing names, pen color and layering conventions.
        vi. Feature compilation shall include, but shall not be limited to: Assessor's Parcel Numbers (APN), street addresses and street names with suffix.
    b. File Format and Media Specification:
        vii. Shall be in compliance with one of the following file formats (AutoCAD DWG format preferred):
            - AutoCAD (version 2000, release 4) drawing file: ___.DWG
            - Drawing Interchange file: _____.DXF
        viii. Shall be in compliance with the following media type:
            - CD Recordable (CD-R) 650 Megabytes
23. All improvement securities (Faithful Performance, Labor and Material and Monument Bonds) and Subdivision Agreement shall be posted with the Public Works Department and approved as to form by the City Attorney, if it is desired to record the final map or obtain building permits before completion of the required improvements.
24. A Certificate of Insurance shall be filed with the Public Works Department and approved as to form by the City Attorney.
25. If the Final Tract map is recorded before the required improvements are completed, a Subdivision Agreement and accompanying bonds may be submitted for construction in accordance with the provisions of the Subdivision Map Act. (SMA)
26. All applicable Public Works fees shall be paid. Fees shall be calculated based on the currently approved rate at the time of payment unless otherwise stated. (ZSO 250.16)
27. A drainage fee for the subject development shall be paid at the rate applicable at the time of Building Permit issuance. The current rate of $14,888 per gross acre is subject to periodic adjustments. This

project consists of 2.97 gross acre (including its tributary area portions along the half street frontages) for a total required drainage fee of $44,167.70. City records indicate the previous use on this property never paid this required fee. Per provisions of the City Municipal Code, this one-time fee shall be paid for all subdivisions or development of land. (MC 14.48)

28. The Final Tract map shall conform to the State's Subdivision Map Act §66433 and to the City's Zoning and Subdivision Ordinance, Ch. 253.

THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO ISSUANCE OF A GRADING PERMIT:

1. The Final Tract map shall be recorded with the County recorder's office.
2. A Precise Grading Plan, prepared by a Licensed Civil Engineer, shall be submitted to the Public Works Department for review and approval. (MC 17.05/ZSO 230.84) The plans shall comply with Public Works plan preparation guidelines and include the following improvements on the plan:
    a. Damaged curb, gutter and sidewalk along the site's Talbert Avenue and Newland Street frontages shall be removed and replaced per Public Works Standard Plan Nos. 202 and 207. (ZSO 230.84)
    b. The existing driveway approaches on Talbert Avenue shall be removed and replaced with curb, gutter, and sidewalk per Public Works Standard Plan Nos. 202 and 207. (ZSO 230.84)
    c. The proposed project driveway approaches shall be constructed per Public Works Standard Plan No. 209 or 211. (ZSO 230.84)
    d. The full depth of the existing AC pavement, for half-width (from existing curb line to the existing street centerline) of the project's Newland Street frontage, shall be removed and replaced. The new roadway section shall be designed pursuant to the recommendations provided by the developer's licensed Geotechnical Engineer and as approved by the City Department of Public Works. (ZSO 230.84)
    e. Installation of new street lights along the project frontage on Talbert Avenue per Public Works Standards and Specifications. (ZSO 230.84)
    f. A new sewer lateral shall be installed connecting to the main in Talbert Avenue. If the new sewer lateral is not constructed at the same location as the existing lateral, then the existing lateral shall be severed and capped at the main or chimney. (ZSO 230.84)
    g. The water system and appurtenances for the entire project shall be a private system
    h. A new domestic master water service and meter shall be installed per Water Division Standards, and sized to meet the minimum requirements set by the California Plumbing Code (CPC) and Uniform Fire Code (UFC), if applicable. If a looped domestic water system is proposed, a master meter at each point of connection to the public water main is required and constructed per Water Division Standards. The onsite domestic water system shall be private and maintained by the HOA. (ZSO 230.84) (MC 14.08.020)
    i. A separate irrigation water service and meter for the common landscaping areas shall be installed per Water Division Standards. (ZSO 232) (MC 14.52)
    j. Separate backflow protection devices at each point of connection to the public water main shall be installed per Water Division Standards for domestic, irrigation and fire water services, and shall be screened from view. (Resolution 5921 and State of California Administrative Code, Title 17)

k. The existing domestic water services and meters shall be abandoned per Water Division Standards. (ZSO 230.84)

l. The fire sprinkler system(s) to each building complex and/or unit that is required by the Fire Department shall be served from a separate dedicated fire service line installed per Water Division Standards. (ZSO 230.84)

m. Any onsite fire hydrant(s) required by the Fire Department and any proposed fire sprinklers to multi-family units shall be served by a dedicated fire water system with an appropriate backflow protection device. The onsite fire hydrant(s) and fire water system shall be private. A looped private fire water system shall require a backflow device at each point of connection to the public water main. These private onsite fire water pipelines shall be separated from the public water main(s) in Talbert Avenue and Newland Street by construction of a double check detector assembly(s) The double check detector assembly(s) shall be constructed per Water Division Standard Plan No. 618, and shall be sized to provide adequate fire flow protection for the private onsite fire hydrant(s) and/or fire sprinkler system(s). The double check detector assembly shall be located within landscape planter area or other area and screened from view by landscaping or other method as approved by the Department of Public Works. The on-going maintenance of this private fire water line, services, and private fire hydrant(s) shall be the responsibility of the HOA. (Resolution 5921, State of California Administrative Code, Title 17)

3. The developer shall submit for approval by the Fire Department and Water Division, a hydraulic water analysis to ensure that fire service connection from the point of connection to City water main to the backflow protection device satisfies Water Division standard requirements.

4. Prior to the issuance of any grading or building permits for projects that will result in soil disturbance of one or more acres of land, the applicant shall demonstrate that coverage has been obtained under the Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ) [General Construction Permit] by providing a copy of the Notice of Intent (NOI) submitted to the State of California Water Resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number. Projects subject to this requirement shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) conforming to the current National Pollution Discharge Elimination System (NPDES) requirements shall be submitted to the Department of Public Works for review and acceptance. A copy of the current SWPPP shall be kept at the project site and another copy to be submitted to the City. (DAMP)

5. A Project Water Quality Management Plan (WQMP) conforming to the current Waste Discharge Requirements Permit for the County of Orange (Order No. R8-2009-0030) [MS4 Permit] prepared by a Licensed Civil Engineer, shall be submitted to the Department of Public Works for review and acceptance. The WQMP shall address Section XII of the MS4 Permit and all current surface water quality issues.

6. The project WQMP shall include the following:

a. Discusses regional or watershed programs (if applicable).

b. Addresses Site Design BMPs (as applicable) such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, creating reduced or “zero discharge” areas, and conserving natural areas.

c. Identifies selected Low Impact Development (LID) and Hydromodification (as applicable) BMPS.

d. Incorporates the *Guidelines for Use of Drywells in Stormwater Management Applications* (if applicable).

e. Incorporates the applicable Routine Source and Structural Control BMPs as defined in the Drainage Area Management Plan. (DAMP)

f. Incorporates GIS or GPS coordinates for all structural and LID BMPs.

g. Describes the long-term operation and maintenance requirements for the Structural and Treatment Control BMPs, including maintenance of BMPs as shown on the landscape plans and are described in the WQMP.

h. Identifies the entity that will be responsible for long-term operation, maintenance, repair and/or replacement of the Structural and Treatment Control BMPs.

i. Describes the mechanism for funding the long-term operation and maintenance of all the Structural and Treatment Control BMPs.

j. Includes an Operations and Maintenance (O&M) Plan for all structural and Treatment Control BMPs including anticipated maintenance costs.

k. Vector Control Clearance letter from the Orange County Vector Control stating that they have reviewed the project WQMP and proposed BMPs.

l. After incorporating plan check comments of Public Works, three final WQMPs (signed by the owner and the Registered Civil Engineer of record) shall be submitted to Public Works for acceptance. After acceptance, two copies of the final report shall be returned to applicant for the production of a single complete electronic copy of the accepted version of the WQMP on CD media that includes:

   i. The 11” by 17” Site Plan in .TIFF format (400 by 400 dpi minimum).

   ii. The remainder of the complete WQMP in .PDF format including the signed and stamped title sheet, owner’s certification sheet, Inspection/Maintenance Responsibility sheet, appendices, attachments and all educational material.

m. The applicant shall return one CD media (with a copy of the approved WQMP) to Public Works for the project record file.

7. Indicate the type and location of Water Quality Treatment Control Best Management Practices (BMPs) on the Grading Plan consistent with the Project WQMP. The WQMP shall follow the City of Huntington Beach; Project Water Quality Management Plan Preparation Guidance Manual dated June 2008. The WQMP shall be submitted with the first submittal of the Grading Plan.

8. A suitable location, as approved by the City, shall be depicted on the grading plan for the necessary trash enclosure(s). The area shall be paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, and screened or walled to prevent off-site transport of trash. The trash enclosure area shall be covered or roofed with a solid, impervious material. Connection of trash area drains into the storm drain system is prohibited. If feasible, the trash enclosure area shall be connected into the sanitary sewer. (DAMP)

9. A soils report, prepared by a Licensed Engineer shall be submitted for reference only. (MC 17.05.150)

10. The applicant’s grading/erosion control plan shall abide by the provisions of AQMD’s Rule 403 as related to fugitive dust control. (AQMD Rule 403)

11. The name and phone number of an on-site field supervisor hired by the developer shall be submitted to the Planning and Public Works Departments. In addition, clearly visible signs shall be posted on the perimeter of the site every 250 feet indicating who shall be contacted for information regarding this development and any construction/grading-related concerns. This contact person shall be available immediately to address any concerns or issues raised by adjacent property owners during the

construction activity. That person will be responsible for ensuring compliance with the conditions herein, specifically, grading activities, truck routes, construction hours, noise, etc. Signs shall include the applicant's contact number, regarding grading and construction activities, and "1-800-CUTSMOG" in the event there are concerns regarding fugitive dust and compliance with AQMD Rule No. 403.

12. The applicant shall notify all property owners and tenants within 300 feet of the perimeter of the property of a tentative grading schedule at least 30 days prior to such grading.

THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLIED WITH DURING GRADING OPERATIONS:

13. An Encroachment Permit is required for all work within the City's right-of-way. (MC 12.38.010/MC 14.36.030)
14. The developer shall coordinate the development of a truck haul route with the Department of Public Works if the import or export of material in excess of 5000 cubic yards is required. This plan shall include the approximate number of truck trips and the proposed truck haul routes. It shall specify the hours in which transport activities can occur and methods to mitigate construction-related impacts to adjacent residents. These plans must be submitted for approval to the Department of Public Works. (MC 17.05.210)
15. Water trucks will be utilized on the site and shall be available to be used throughout the day during site grading to keep the soil damp enough to prevent dust being raised by the operations. (California Stormwater BMP Handbook, Construction Wind Erosion WE-1)
16. All haul trucks shall arrive at the site no earlier than 8:00 a.m. or leave the site no later than 5:00 p.m., and shall be limited to Monday through Friday only. (MC 17.05)
17. Wet down the areas that are to be graded or that is being graded, in the late morning and after work is completed for the day. (WE-1/MC 17.05)
18. The construction disturbance area shall be kept as small as possible. (California Stormwater BMP Handbook, Construction Erosion Control EC-1) (DAMP)
19. All haul trucks shall be covered or have water applied to the exposed surface prior to leaving the site to prevent dust from impacting the surrounding areas. (DAMP)
20. Prior to leaving the site, all haul trucks shall be washed off on-site on a gravel surface to prevent dirt and dust from leaving the site and impacting public streets. (DAMP)
21. Comply with appropriate sections of AQMD Rule 403, particularly to minimize fugitive dust and noise to surrounding areas. (AQMD Rule 403)
22. Wind barriers shall be installed along the perimeter of the site. (DAMP)
23. All construction materials, wastes, grading or demolition debris and stockpiles of soils, aggregates, soil amendments, etc. shall be properly covered, stored and secured to prevent transport into surface or ground waters by wind, rain, tracking, tidal erosion or dispersion. (DAMP)

THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO ISSUANCE OF A BUILDING PERMIT:

24. A Precise Grading Permit shall be issued. (MC 17.05)
25. The applicable Orange County Sanitation District Capital Facility Capacity Charge shall be paid to the City Department of Public Works. (Ordinance OCSD-40)

THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO ISSUANCE OF AN ENCROACHMENT PERMIT:

26. Traffic Control Plans, prepared by a Licensed Civil or Traffic Engineer, shall be prepared in accordance with the latest edition of the City of Huntington Beach Construction Traffic Control Plan Preparation Guidelines and submitted for review and approval by the Public Works Department. (Construction Traffic Control Plan Preparation Guidelines)

THE FOLLOWING DEVELOPMENT REQUIREMENTS SHALL BE COMPLETED PRIOR TO FINAL INSPECTION OR OCCUPANCY:

27. Complete all improvements as shown on the approved grading and improvement plans. (MC 17.05)
28. All existing and new utilities shall be undergrounded. This requirement applies to all existing, overhead utility lines crossing Talbert Avenue and Newland Street to the subject site and along the subject site's Talbert Avenue and Newland Street frontages. (MC 17.64)
29. All applicable Public Works fees shall be paid at the current rate unless otherwise stated, per the Public Works Fee Schedule adopted by the City Council and available on the city web site at http://www.surfcity-hb.org/files/users/public_works/fee_schedule.pdf. (ZSO 240.06/ZSO 250.16)
30. Traffic Impact Fees (TIF) for the project shall be paid prior to final occupancy. The current rate for an attached residential unit is $1,607.96/unit. The TIF is adjusted annually. (MC 17.65)
31. Prior to grading or building permit close-out and/or the issuance of a certificate of use or a certificate of occupancy, the applicant shall:
    a. Demonstrate that all structural Best Management Practices (BMPs) described in the Project WQMP have been constructed and installed in conformance with approved plans and specifications.
    b. Demonstrate all drainage courses, pipes, gutters, basins, etc. are clean and properly constructed.
    c. Demonstrate that applicant is prepared to implement all non-structural BMPs described in the Project WQMP.
    d. Provide certifications from the Engineer of Record or Landscape Architect that the LID BMPs were constructed and installed per the approved project plans and specifications. The certifications shall be included in the final WQMP.
    e. Demonstrate that an adequate number of copies of the approved Project WQMP are available for the future occupiers.
    f. Demonstrate that the preparer of the WQMP has reviewed the BMP maintenance requirements in Section V of the WQMP with the responsible person and that a copy of the WQMP has been provided to that person. A certification letter from the WQMP preparer may be used to satisfy this condition.
32. The developer shall execute a Landscape License & Maintenance Agreement to address the continuing maintenance and liability for all landscaping, irrigation, furniture and hardscape within the public right-of-way along the project's Talbert Avenue and Newland Street frontages. The agreement shall describe all aspects of maintenance such as sidewalk repair and cleaning, trash cans, signs, tree or palm replacement and any other aspect of maintenance that is warranted by the development plan improvements proposed. The agreement shall state that the property ownership shall be responsible for all costs associated with maintenance, repair, replacement, liability and fees.

Attachment D

Geotechnical Report

ALBUS & ASSOCIATES
formerly Albus-Keefe & Associates, Inc.

February 24, 2022
J.N.: 2949.00

Mr. Tom Moore
The Olson Company
3010 Old Ranch Parkway, Suite 100
Seal Beach, California 90740

Subject: **Geotechnical Grading Plan Review Report, Proposed Multi-Family Residential Development, 8371-8375 Talbert Avenue, Huntington Beach, California**

Dear Mr. Moore,

Albus & Associates, Inc. is pleased to present to you our geotechnical grading plan review report for the proposed development at the subject site. This report presents the results of our literature review, subsurface exploration, laboratory testing, and engineering analyses. Conclusions relevant to the feasibility of the proposed site development are also presented herein based on the findings of our work.

We appreciate this opportunity to be of service to you. If you have any questions regarding the contents of this report, please do not hesitate to call.

Sincerely,

ALBUS & ASSOCIATES, INC.

Paul Hyun Jin Kim
Associate Engineer

REPORT

FIGURES AND PLATES

APPENDICES

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of our work was to evaluate the feasibility of proposed site development in order to assist you in your land acquisition evaluation and due-diligence review. The scope of our work for this investigation was focused primarily on the geotechnical issues that we expect could have significant fiscal impacts on future site development. While this report is comprehensive for feasibility purposes, it is not intended for final design purposes. As such, additional geotechnical studies may be warranted based on our review of future rough grading plans and foundation plans. The scope of our work for this investigation included the following:

- Review of published geologic and seismic data for the site and surrounding area
- Exploratory drilling and soil sampling
- Laboratory testing of select soil samples
- Engineering analyses of data obtained from our review, exploration, and laboratory testing
- Evaluate site seismicity, liquefaction potential, and settlement potential
- Preparation of this report

1.2 SITE LOCATION AND DESCRIPTION

The site is located at 8371-8375 Talbert Avenue, city of Huntington Beach, California and spans several properties. The site is bordered by single- and multi-family residences to the north, Newland Street to the east, St. Vincento de Paul Catholic Church to the west, and Talbert Avenue to the south. The location of the site and its relationship to the surrounding area is shown on Figure 1, Site Location Map.

The project site and overall property is relatively flat with elevation ranging from 44 to 45 feet above mean sea level (based on Google Earth). It appears that the site drains generally west away from Newland Street towards an existing storm drain at the western property line. The site is currently occupied by three single family residences. Additional buildings are on site and are either detached garages or storage spaces. There are four driveways covered in asphalt and some hardscaped features within some spaces near the residences. The remainder of the site is covered by grass or vegetation. Vegetation consists of small shrubs to moderate sized trees. The site is largely open along the west, south and east property lines, however, the northern property line is bordered by a masonry block wall shared with properties north of the site.

N

FIGURE 1-SITE LOCATION MAP

The Olson Company
Proposed Residential Development
8371-8375 Talbert Avenue
Huntington Beach, California.

NOT TO SCALE

1.3 PROPOSED DEVELOPMENT

We understand the site is presently developed with several single-family residential buildings and the site will be redeveloped for residential use. We anticipate the proposed site will consist of approximately 34 three-story townhomes over 9 buildings, associated interior driveways, perimeter/retaining walls, underground utilities, and a storm water infiltration system.

A grading plan, dated February 22, 2022 was provided for our review. Generally speaking, minor fills of less than 1 foot is planned toward the east portion of the site. While the west portion of the site indicates maximum cuts of less than 3 feet. The north property line indicates cuts of generally 1 foot or less. A swale is planned along the south property line. Specific elevations were not provided throughout the majority of the swale but given the finished surface elevation of the planned storm drain culvert at the west end of the swale, the swale is anticipated to be less than 1 foot deep. Along

the west end of the site within proposed Drive "F", a maximum of 6 feet of fill is planned. A retaining wall is likely needed along the west property line.

A structural plan was not available during the preparation of this report. We expect the proposed residential dwellings will be 2- to 3-story, wood-framed structures with concrete slabs on grade yielding relatively light foundation loads.

2.0 INVESTIGATION

2.1 RESEARCH

We have reviewed the referenced geologic publications, maps, and historical aerial photos of the vicinity. Data from these sources were utilized to the development of some of our findings and conclusions presented in this report.

We have also reviewed historical aerial photographs for the site and surrounding area from our in-house library. Based on our review, the site has remained relatively unchanged from the 1950's.

2.2 SUBSURFACE EXPLORATION

Subsurface explorations for this investigation were conducted on January 15, 2021 and consisted of drilling 5 soil borings to a maximum depth of approximately 51.5 feet below the existing ground surface (bgs). The borings were drilled using a truck-mounted, continuous-flight, hollow-stem-auger drill rig. A representative of *Albus & Associates, Inc*. logged the exploratory borings. Visual and tactile identifications were made of the materials encountered, and their descriptions are presented on the Exploration Logs in Appendix A. The approximate locations of the borings are shown on the enclosed Geotechnical Map, Plate 1.

Bulk, relatively undisturbed and Standard Penetration Test (SPT) samples were obtained at selected depths for subsequent laboratory testing. Relatively undisturbed samples were obtained using a 3-inch O.D., 2.5-inch I.D., California split-spoon soil sampler lined with brass rings. SPT samples were obtained using a standard SPT soil sampler. During each sampling interval, the samplers were driven 18 inches with successive drops of a 140-pound automatic hammer falling 30 inches. The number of blows required to advance the sampler was recorded for each six inches of advancement. The total blow count for the lower 12 inches of advancement per soil sample is recorded on the exploration log. Samples were placed in sealed containers or plastic bags and transported to our laboratory for analyses and testing. The borings were backfilled with soil cuttings upon completion of drilling and capped with AC cold patch where necessary.

A percolation test well (P-1) was drilled adjacent to exploratory boring B-1 for subsequent percolation testing. The percolation test wells were later backfilled with auger cuttings upon completion of testing. Results of our percolation testing are discussed later in a separate report.

2.3 LABORATORY TESTING

Selected samples of representative earth materials from the borings were tested in our laboratory. Tests consisted of in-situ moisture and dry density, maximum dry density and optimum moisture content, Atterberg limits, expansion index, soluble sulfate content, grain size analysis, consolidation/collapse potential, direct shear, and corrosivity. Descriptions of laboratory testing and a summary of the test results are presented in Appendix B and on the exploration log in Appendix A.

3.0 SUBSURFACE CONDITIONS

3.1 SOIL CONDITIONS

Descriptions Soil materials encountered on site generally consist of very old marine deposits (Qvom) locally mantled by artificial fill (CDMG 1997). The very old marine deposits deposits were present to the maximum depth explored (51.5 feet).

Artificial fill materials were encountered up to about 8 feet below the existing ground surface only within B-1 and generally consist of light brown to brown silty sand with gravel. These materials are typically dry to damp and medium dense to dense. Artificial fill materials of greater depth may present beneath portions of the site in association with the existing development and underground utilities.

Very old marine deposits (Qvom) underlie below the current grade or the artificial fill within the site. The near surface very old marine materials consist of reddish brown, damp, very stiff to hard clay. Deeper portion of the very old marine deposits consist of brown, olive brown, and grayish brown, damp to wet, medium dense to very dense clay sand, silty sand, sand with silt, and sand.

A more detailed description of the interpreted soil profile at each of the boring locations, based upon the borehole cuttings and soil samples, are presented in Appendix A. The stratigraphic descriptions in the logs represent the predominant materials encountered and relatively thin, often discontinuous layers of different material may occur within the major divisions.

3.2 GROUNDWATER

Groundwater was encountered during this firm’s subsurface exploration at a depth of 38 feet below the existing ground surface. The CDMG Seismic Hazard Zone Report 03 suggest that historical high groundwater for the subject site is deeper than 30 feet.

3.3 FAULTING

Geologic literature and field exploration do not indicate the presence of active faulting within the site. The site does not lie within an "Earthquake Fault Zone" as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act. Table 3.1 presents a summary of all the known seismically active faults within 10 miles of the site based on the 2008 National Seismic Hazards Maps.

Table 3.1
Summary of Faults

Name	Distance (miles)	Slip Rate (mm/yr.)	Preferred Dip (degrees)	Slip Sense	Rupture Top (km)	Fault Length (km)
Newport Inglewood Connected alt 2	1.81	1.3	90	strike slip	0	208
Newport-Inglewood, alt 1	1.93	1	88	strike slip	0	65
Newport Inglewood Connected alt 1	1.93	1.3	89	strike slip	0	208
San Joaquin Hills	2.78	0.5	23	thrust	2	27
Newport-Inglewood (Offshore)	8.51	1.5	90	strike slip	0	66

4.0 ANALYSES

4.1 SEISMICITY AND SEISMIC DESIGN PARAMETERS

2019 CBC requires seismic parameters in accordance with ASCE 7-16. Unless noted otherwise, all section numbers cited in the following refer to the sections in ASCE 7-16.

Per Section 20.3 the project site was designated as Site Class D. We used the OSHPD seismic hazard tool to obtain the basic mapped acceleration parameters, including short periods (S_S) and 1-second period (S_1) MCE_R Spectral Response Accelerations. Section 11.4.8 requires site-specific ground hazard analysis for structures on Site Class E with S_S greater than or equal to 1.0 or Site Class D or E with S_1 greater than or equal to 0.2. Based on the mapped values of S_S and S_1 the project site falls within this category, requiring site specific hazard analysis in accordance with Section 21.2.

However, "A ground motion hazard analysis is not required for structures where: Structures on Site Class D sites with S_1 greater than or equal to 0.2, provided the value of the seismic response coefficient Cs is determined by Eq. (12.8-2) for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for $T_L \geq T > 1.5T_s$ or Eq. (12.8-4) for $T > T_L$." Assuming this exception is met for this project, a ground motion hazard analysis is not required and mapped seismic values can be used. Should this exception not be met, a ground motion hazard analysis is required to determine the Design response spectra for the proposed structures at this site. Both mapped and site specific seismic design parameters are provided in this report as presented in Section 6.2. Details of a ground motion hazard analysis are explained below.

According to Section 21.2.3 (Supplement 1), the site-specific Risk Targeted Maximum Considered Earthquake (MCE_R) spectral response acceleration at any period is the lesser of the probabilistic and the deterministic response accelerations, subject to the exception specified in the same section. The probabilistic response spectrum was developed using the computer program OpenSHA (Field et al., 2013), which implements Method 1 as described on Section 21.2.1.1. Fault Models 3.1 and 3.2 from the Third Uniform California Earthquake Rupture Forecast (UCERF3) were used as the earthquake rupture forecast models for the PSHA. In addition to known fault sources, background seismicity was also included in the PSHA. The ground motion Prediction Equations (GMPEs) selected for use in this analysis are those developed for the Pacific Earthquake Engineering Research Center (PEER) Next Generation Attenuation (NGA) West 2 project. Four GMPEs - Abrahamson et al. (2014), Boore et al. (2014), Campbell and Bozorgnia (2014), and Chiou and Youngs (2014) were used to perform the analysis.

In accordance with Section 21.2.2 (Supplement 1), the deterministic spectral response acceleration at each period was calculated as the 84^{th} percentile, 5% damped response acceleration, using NGA-West2 GMPE Worksheet. For this, the information from at least three causative faults with the greatest contribution per deaggregation analysis were used and the larger acceleration spectrum among these was selected as the deterministic response spectrum. The deterministic spectrum was adjusted per requirements in Section 21.2.2 (Supplement 1) where applicable. Both probabilistic and deterministic spectra were subjected to the maximum direction scale factors specified in Section 21.2 to produce the maximum acceleration spectra.

Design response spectrum was developed by subjecting the site-specific MCE_R response spectrum to the provisions outlined in Section 21.3. This process included comparison with 80% code-based design spectrum determined in accordance with Section 11.4.6. The short period and long period site coefficient (Fa and Fv, respectively) were determined per Section 21.3 in conjunction with Table 11.4-1. Site specific design acceleration parameters (S_{MS}, S_{M1}, S_{DS}, and S_{D1}) were calculated according to Section 21.4.

Per Section 11.2 (definitions on Page 79 of ASCE7-16) for evaluation of liquefaction, lateral spreading, seismic settlements, and other soil-related issues, Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration PGA_M shall be used. The site-specific PGA_M is calculated per Section 21.5.3, as the lesser of the probabilistic PGA_M (Section 21.5.1) and deterministic PGA_M (Section 21.5.2), but no less than 80% site modified peak ground acceleration, PGA_M, obtained from OSHPD seismic hazard tool. From our analyses, we obtain a PGA_M of 0.719g.

4.2 STATIC SETTLEMENT

Analyses were performed to estimate settlement of footings for the anticipated loading conditions and configurations. Loading conditions for the proposed foundations are not known at this time. Based on previous experience, we have assumed the maximum load will not exceed 3 kips/ft. for continuous loads.

Based on the anticipated foundation loads and provided the existing near-surface materials are removed and recompacted to provide a uniform layer of engineered compacted fill, the total and differential static settlements are not anticipated to exceed 1 inch and ½-inch over 30 feet, respectively, for the proposed residential structures.

4.3 LIQUEFACTION

Engineering research of soil liquefaction potential (Youd, et al., 2001) indicates that generally three basic factors must exist concurrently in order for liquefaction to occur. These factors include:

- A source of ground shaking, such as an earthquake, capable of generating soil mass distortions.
- A relatively loose silty and/or sandy soil.
- A relative shallow groundwater table (within approximately 50 feet below ground surface) or completely saturated soil conditions that will allow positive pore pressure generation.

The site is not located within a State-designated zone of potentially liquefiable soils. Additionally, the site is underlain by very old marine deposits that are of Pleistocene aged and typically not susceptible to liquefaction. As a result, the potential of liquefaction occurring during a seismic event is considered to be very low.

5.0 CONCLUSIONS

5.1 FEASIBILITY OF PROPOSED DEVELOPMENT

From a geotechnical point of view, the proposed site development is considered feasible provided the recommendations presented in this report are incorporated into the design and construction of the project. Furthermore, it is also our opinion that the proposed development will not adversely impact the stability of adjoining properties if grading and construction is performed in accordance with the recommendations presented in this report. Key issues that could have significant impacts on the geotechnical aspects of the proposed site development are discussed in the following sections of this report.

5.2 GEOLOGIC HAZARDS

5.2.1 Ground Rupture

No known active faults are known to project through the site nor does the site lie within the boundaries of an "Earthquake Fault Zone" as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act. The closest known active fault is the Newport Inglewood Connected alt 2 fault located about 1.8 miles from the site. Therefore, the potential for ground rupture due to an earthquake beneath the site is considered low.

5.2.2 Ground Shaking

The site is situated in a seismically active area that has historically been affected by generally moderate to occasionally high levels of ground motion. The site lies in relatively close proximity to several seismically active faults; therefore, during the life of the proposed structures, the property will probably experience similar moderate to occasionally high ground shaking from these fault zones, as well as some background shaking from other seismically active areas of the Southern California region. Potential ground accelerations have been estimated for the site and are presented in Section 4.1 of this report. Design and construction in accordance with the current California Building Code (C.B.C.) requirements is anticipated to adequately address potential ground shaking.

5.2.3 Liquefaction

The site is underlain by very dense Pleistocene-aged very old marine deposits typically not susceptible to the effects of liquefaction. As such the potential for liquefaction at the site is considered to be low. Furthermore, the site is not located within a mapped California Geologic Survey liquefaction hazard zone.

5.3 STATIC SETTLEMENT

The earth materials at the site are generally very stiff/medium dense to hard/very dense and are anticipated to result in minor settlement due to the weight of new foundations. Provided the existing near surface disturbed soils are removed and recompacted, total and differential static settlement can likely be limited to a maximum of 1 inch and ½-inch over 30 feet, respectively. These estimated magnitudes of static settlements are considered within tolerable limits for the proposed residential structures.

5.4 EXCAVATION AND MATERIAL CHARACTERISTICS

In general, the existing upper 3 feet of surface soils and any artificial fill (approximate thickness of 8 feet in the southwest corner of the site) encountered should be removed and recompacted to support proposed structural fills and site development.

Temporary construction slopes and trench excavations can likely be cut vertically up to a height of 4 feet within the onsite materials provided that no surcharging of the excavations is present. Temporary excavations greater than 4 feet in height will likely require side laybacks to 1:1 (H:V) or flatter to mitigate the potential for sloughing. Vertical excavations exposing sandy materials will likely have no tolerance for a vertical cut and require laybacks at a 1.5:1 gradient (H:V). Site materials may be prone to sloughing and possible caving if allowed to dry.

Due to the existing foundation slab and pavement, significant portions of concrete and asphalt debris can likely be reduced in size to less than 4 inches and incorporated within fill soils during earthwork operations.

Onsite disposal systems, clarifiers, and other underground improvements are likely to be present on site. If encountered during future rough grading, these improvements will require proper abandonment or removal.

Off-site improvements exist near and along the property lines. The presence of the existing offsite improvements will limit removals of unsuitable materials adjacent the property lines, particularly along the northwest and south property lines. Special grading techniques, such as slot cutting, will be required adjacent to the property lines were offsite structures are nearby. Additionally, grading along public right-of-ways will require special grading techniques, especially if construction fences are placed inside of the property lines which limit removals. Construction of perimeter site walls will require special consideration so as not to disturb the existing property line walls.

Subsurface soils are anticipated to be relatively easy to excavate with conventional heavy earthmoving equipment. Removal and recompaction of the site materials will result in some moderate shrinkage

and subsidence. Design of site grading will require consideration of this loss when evaluating earthwork balance issues.

The near-surface soils are typically at or slightly above optimum moisture content. In addition, there are variable earth materials consisting of sand and clay. These materials will require mixing to provide a uniform blanket of engineered fill. Some minor addition of water may be required to elevate the moisture content to achieve proper compaction.

5.5 SHRINKAGE AND SUBSIDENCE

Volumetric changes in earth quantities will occur when excavated onsite soil materials are replaced as properly compacted fill. We estimate the existing upper earth materials will shrink up to approximately 5 percent. The estimates of shrinkage and bulkage are intended as an aid for project engineers in determining earthwork quantities. However, these estimates should be used with some caution since they are not absolute values. Contingencies should be made for balancing earthwork quantities based on actual swelling and bulkage that occurs during the grading process.

5.6 SOIL EXPANSION

Based on our laboratory test results and the USCS visual manual classification, the near-surface soils within the site are generally anticipated to possess a **Medium** expansion potential. Additional testing for soil expansion will be required subsequent to rough grading and prior to construction of foundations and other concrete work to confirm these conditions.

6.0 RECOMMENDATIONS

6.1 EARTHWORK

6.1.1 General Earthwork and Grading Specifications

All earthwork and grading should be performed in accordance with applicable requirements of Cal/OSHA, applicable specifications of the Grading Codes of the City of Huntington Beach, California in addition to the recommendations presented herein.

6.1.2 Pre-Grade Meeting and Geotechnical Observation

Prior to commencement of grading, we recommend a meeting be held between the developer, City Inspector, grading contractor, civil engineer, and geotechnical consultant to discuss the proposed grading and construction logistics. We also recommend that a geotechnical consultant be retained to provide soil engineering and engineering geologic services during site grading and foundation construction. This is to observe compliance with the design specifications and recommendations, and to allow design changes in the event that subsurface conditions differ from those anticipated. If conditions are encountered that appear to be different than those indicated in this report, the project geotechnical consultant should be notified immediately. Design and construction revisions may be required.

6.1.3 Site Clearing

All existing site improvements, oversized materials, vegetation and other deleterious materials should be removed from the areas to be developed. Existing underground improvements such as utility lines, septic tanks, seepage pits, etc. are also anticipated at the site. If encountered during site development, these improvements should also be completely removed from the site and seepage pits should be properly abandoned in accordance with the requirements established by the governing agencies as well as recommendations made in the field by the project geotechnical consultant.

In general, seepage pits that are open should be cleared of any fluids and then filled with 2-sack cement slurry up to within 5 feet of proposed grades. Any brick lining that remains in the upper 5 feet should be removed and the remainder of the pit filled with engineered fill in accordance with Section 6.1.6. Seepage pits that are presently backfilled with soil should be removed to a depth of 10 feet below pad grade and be capped with 2-sack cement slurry. The slurry cap should be at least 5 feet thick and should extend at least 12 inches outside the perimeter of the seepage pit. The remaining 5 feet should be filled with engineered fill in accordance with Section 6.1.6.

The project geotechnical consultant should be notified at the appropriate times to provide observation services during clearing operations to verify compliance with the above recommendations. Voids created by clearing and excavation should be left open for observation by the geotechnical consultant. Should any unusual soil conditions or subsurface structures be encountered during site clearing or grading that are not described or anticipated herein, these conditions should be brought to the immediate attention of the project geotechnical consultant for corrective recommendations as needed.

Concrete and asphaltic concrete debris generated by site demolition can be reduced to no more than 4 inches in maximum dimension and uniformly incorporated with fill soils during earthwork operations.

6.1.4 Ground Preparation

In general, the existing artificial fill is considered unsuitable for support of the proposed development. Artificial fills were only encountered within B-1 up to 8 feet in depth. These fills are associated with leveling of the western property line from the previous nature slope. These fills are anticipated to taper off heading east towards the existing residence and to daylight prior to the residence. No additional fill materaisl were encountered within the remainder of the property, however, fill materials are expected to be present locally around the existing site improvements and various existing buildings.

The removals of existing artificial fills will be required in proposed building pads, retaining walls, and any other “structural” areas, and replaced as engineered compacted fill. Due to the proximity of proposed Drive “F” and the proposed finish surface elevation, removal of the artificial fill soils will be necessary along the west property line. The removals should extend a minimum distance of 5 feet beyond the foundations. Elsewhere, the near surface soils should also be removed to a minimum depth of 12 inches below subgrade for pavement and 12 inches for screen walls. Such removals should extend at least 2 feet beyond the edges of pavement and footings. In addition to general removal of existing fills, the existing soils should be over-excavated to a minimum depth of 2 foot below the bottom of footings for residential structures.

Removals should extend laterally beyond the limits of the proposed buildings and retaining walls over 3 feet in height a distance equal to the depth of removal (i.e. 1:1 projection) but not less than 5 feet.

Existing soils below proposed retaining walls less than 3 feet in height, screen walls, hardscapes and roadways ways should be removed laterally to at least the edge of the structure or pavement. Where removals are limited by existing structures, protected trees or property lines, special considerations may be required in the construction of affected improvements. Under such conditions, specific recommendations should be provided by this firm.

All removal excavations should be evaluated by the geotechnical consultant during grading to confirm the exposed conditions are as anticipated and to provide supplemental recommendations if required.

The grading contractor should take appropriate measures when excavating adjacent any existing improvements to remain in-place to avoid disturbing or compromising support of existing structures.

Following removals and overexcavation, the exposed grade should first be scarified to a depth of 6 inches, brought to at least 120 percent of the optimum moisture content, and then compacted to at least 90 percent of the laboratory standard (ASTM D 1557).

6.1.5 Temporary Excavations

Temporary construction slopes and trench excavations may be cut vertically up to a height of 4 feet provided that no surcharging of the excavations is present. Temporary excavations greater than 4 feet in height but no more than 10 feet should be laid back to a 1:1 (H:V) or flatter or shored to mitigate the potential for instability. Where temporary excavations expose granular soils, the vertical cut may be decreased to as much as zero (0) and lay backs will likely be flatter to a gradient of 2:1 (H:V).

Excavations should not be left open for prolonged periods of time. The project geotechnical consultant should observe all temporary cuts to confirm anticipated conditions and to provide alternate recommendations if conditions dictate. All excavations should conform to the requirements of Cal/OSHA.

The grading contractor should take appropriate measures when excavating adjacent existing improvements to avoid disturbing or compromising support of existing structures.

6.1.6 Fill Placement

Materials excavated from the site may be reused as fill provided they are free of deleterious materials and particles greater than 4 inches in maximum dimension (oversized materials). Asphaltic and concrete debris generated during site demolition or encountered within the existing fill can be incorporated within new fill soils during earthwork operations provided they are reduced to no more than 4 inches in maximum dimension. Such materials should be mixed thoroughly with fill soils to prevent nesting. All fill should be placed in lifts no greater than 8 inches in loose thickness, moisture conditioned to at least 120 percent of the optimum moisture content, then compacted in place to at least 90 percent of the laboratory standard. Each lift should be treated in a similar manner. Subsequent lifts should not be placed until the project geotechnical consultant has approved the preceding lift.

6.1.7 Import Materials

If import materials are required to achieve the proposed finish grades, the import soils should have an Expansion Index (EI) less than 90 (ASTM D 4829) and negligible soluble sulfate content. Import

sources should be indicated to the geotechnical consultant at least 3 days prior to hauling the materials to the site so that appropriate testing and evaluation of the fill materials can be performed in advance.

6.2 SITE SPECIFIC SEISMIC DESIGN PARAMETERS

6.2.1 Mapped Seismic Design Parameters

For design of the project in accordance with Chapter 16 of the 2019 CBC, the mapped seismic parameters may be taken as presented in the tables below.

TABLE 6.1
2019 CBC Mapped Seismic Design Parameters

Parameter	Value
Site Class	D
Mapped MCE_R Spectral Response Acceleration, short periods, S_S	1.395
Mapped MCE_R Spectral Response Acceleration, at 1-sec. period, S_1	0.506
Site Coefficient, F_a	1.0
Site Coefficient, F_v	1.8*
Adjusted MCE_R Spectral Response Acceleration, short periods, S_{MS}	1.395
Adjusted MCE_R Spectral Response Acceleration, at 1-sec. period, S_{M1}	0.911
Design Spectral Response Acceleration, short periods, S_{DS}	0.93
Design Spectral Response Acceleration, at 1-sec. period, S_{D1}	0.607
Long-Period Transition Period, T_L (sec.)	8
Seismic Design Category for Risk Categories I-IV	II

MCE_R = Risk-Targeted Maximum Considered Earthquake

*According to Section 11.4.8 in ASCE 7-16, "a ground motion hazard analysis shall be performed in accordance with Section 21.2 for the following structures on Site Class D and E sites with S_1 greater than or equal to 0.2." However, "A ground motion hazard analysis is not required for structures where: Structures on Site Class D sites with S_1 greater than or equal to 0.2, provided the value of the seismic response coefficient C_s is determined by Eq. (12.8-2) for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for $T_L \geq T > 1.5T_s$ or Eq. (12.8-4) for $T > T_L$." The F_v value of 1.8 above from Table 11.4-2 assumes that this exception is met and that a ground motion hazard analysis is not required. Should this exception not be met, the site-specific seismic design parameters provided in the next section should be used.

6.2.2 Site-Specific Seismic Design Parameters

In addition to the Code Spectra parameters presented in Table 6.1, we have performed a site-specific ground motion hazard analysis in accordance with Chapter 21 of ASCE 7-16 to obtain site-specific seismic design acceleration parameters, the risk-targeted maximum considered earthquake response spectrum, and the design earthquake response spectrum. The site-specific seismic design parameters are presented below.

TABLE 6.2
2019 CBC Site Specific Seismic Design Parameters

Parameter	Value
Site Class	D
Site Coefficient, F_a	1.0
Site Coefficient, F_v	2.5
Adjusted MCE Spectral Response Acceleration, short periods, S_{MS}	1.667
Adjusted MCE Spectral Response Acceleration, at 1-sec. period, S_{M1}	1.415
Design Spectral Response Acceleration, short periods, S_{DS}	1.111
Design Spectral Response Acceleration, at 1-sec. period, S_{D1}	0.943

MCE = Maximum Considered Earthquake

6.3 FOUNDATION DESIGN

6.3.1 General

The following design parameters are provided to assist the project structural engineer to design foundation systems to support the proposed structures at the site. Recommendations for design of other foundation systems will be provided upon request. These design parameters are based on typical site materials encountered during subsurface exploration and are provided for preliminary design and estimating purposes. Depending on actual materials encountered during site grading and actual foundation loads, the design parameters presented herein may require modification.

6.3.2 Soil Expansion

The recommendations presented herein are based on soils with a **Medium** expansion potential (EI < 90). Following site grading, additional testing of site soils should be performed by the project geotechnical consultant to confirm the basis of these recommendations. If site soils with higher expansion potentials are encountered or imported to the site, the recommendations contained herein may require modification.

6.3.3 Settlement

Under normal static conditions, the foundation system should be designed to tolerate a total settlement of 1 inch and a differential settlement of ½-inch over 30 feet. The foundations should also be designed for total and differential seismic settlement of 0.53 inches and 0.26 inches over 30 feet, respectively. The PTI design parameters presented below incorporate the estimated seismic settlements.

6.3.4 Allowable Bearing Value

Provided site grading is performed as recommended herein, a bearing value of 3,000 pounds per square foot (psf) may be used for continuous beams or isolated pad footings. The bearing value is based on beams having a minimum width of 12 inches and founded at a minimum of 12 inches below the lowest adjacent grade. The bearing value for isolated pad footings is based on a minimum width of 24 inches and founded a minimum of 12 inches. The above value may be increased by 75 psf and 250 psf for each additional foot in width and depth, respectively, up to a maximum value of 4,000 psf.

Recommended allowable bearing values include both dead and live loads and may be increased by one-third for wind and seismic forces.

6.3.5 Lateral Resistance

Provided site grading is performed in accordance with the recommendations provided by the project geotechnical consultant, a passive earth pressure of 225 pounds per square foot per foot of depth up to a maximum value of 2,500 pounds per square foot may be used to determine lateral bearing for beams. This value may be increased by one-third when designing for wind and seismic forces. A coefficient of friction of 0.21 may also be used between concrete and the supporting soils to determine lateral sliding resistance. No increase in the coefficient of friction should be used when designing for wind and seismic forces. Where lateral removals cannot be performed, the passive resistance values should be decreased by 50% such as property line walls.

The above values are based on foundations placed directly against compacted fill. In the case where footing sides are formed, all backfill against the foundations should be compacted to at least 90 percent of the laboratory standard.

6.3.6 Post-Tensioned Slab/Mat on Grade

Due to expansion potential and settlement, the proposed structures may be supported by a post-tension slab. Perimeter edge beams for the post-tensioned slabs should have a minimum effective width of 12 inches and be founded at a minimum depth of 18 inches below the lowest adjacent final ground surface. Interior beams may be founded at a minimum depth of 12 inches below the tops of the finish floor slabs. Where a post-tensioned mat is utilized, the exterior edge of the mat should be embedded at least 8 inches below the lowest adjacent grade. The thickness of the floor slab/mat should be determined by the project structural engineer; however, we recommend a minimum slab thickness of 5.0 inches.

Design of the mat may be based on a modulus of subgrade reaction (Kv1) of 83 pounds per cubic inch (pci). The modulus is based on an effective loading area of 1 foot by 1 foot. The modulus may be adjusted for other effective loading areas using the equation provided below.

$$k_b(pci) = 83\left\{\frac{b+1}{2b}\right\}^2$$

where “b” is the effective width of loading (minimum dimension) in feet.

Concrete floor slabs in areas to receive carpet, tile, or other moisture sensitive coverings should be underlain with a minimum of 10-mil moisture vapor retarder conforming to ASTM E 1745, Class A. The membrane should be properly lapped, sealed, and underlain within a layer of sand at least 2 inches thick. One inch of sand may be placed over the membrane to aid in the curing of the concrete. The sand should have a SE no less than 30. This vapor retarder system is anticipated to be suitable for most flooring finishes that can accommodate some vapor emissions. However, this system may emit more than 4 pounds of water per 1000 sq. ft. and therefore, may not be suitable for all flooring finishes. Additional steps should be taken if such vapor emission levels are too high for anticipated flooring finishes.

Prior to placing concrete, subgrade soils below slab-on-grade/mat areas should be thoroughly moistened to provide moisture contents at least 120 percent of the optimum moisture content to a depth of 12 inches.

Based on the guidelines provided in the "Design of Post-Tensioned Slabs-on-Ground" 3rd Edition by Post-Tensioning Institute, the em and ym values are summarized below:

TABLE 6.3
PTI Design Parameters

Parameter	Value
Edge Lift Moisture Variation Distance, e_m	4.3 feet
Edge Lift, y_m	2.128 inches
Center Lift Moisture Variation Distance, e_m	8.3 feet
Center Lift, y_m	1.492 inches

6.3.7 Foundation Observations

Foundation excavations should be observed by the project geotechnical consultant to verify that they have been excavated into competent bearing soils and to the minimum embedment recommended above. These observations should be performed prior to placement of forms or reinforcement. The excavations should be trimmed neat, level and square. Loose, sloughed or moisture-softened materials and debris should be removed prior to placing concrete.

6.4 RETAINING AND SCREENING WALLS

6.4.1 General

The following preliminary design and construction recommendations are provided for general retaining and screen walls. Final wall designs specific to the site development should be provided to project geotechnical consultant for review once completed. The structural engineer and architect should provide appropriate recommendations for sealing at all joints and applying moisture-proofing material on the back of the walls.

6.4.2 Allowable Bearing Value and Lateral Resistance

The values for bearing and lateral resistance should be 1,500 psf and 150 psf, respectively, in design of retaining and screen walls. A coefficient of friction of 0.21 may also be used. The coefficient of friction should not be applied to portions of the footing in front of keyways used for passive resistance.

The above values are based on footings placed directly against properly compacted fill. In the case where footing sides are formed, all backfill against the footings should be compacted to at least 90 percent of the laboratory standard.

6.4.3 Earth Pressures

Static and seismic earth pressures for level and 2:1 (H:V) backfill conditions are provided in Table 6.3. Seismic earth pressures provided herein are based on the method provided by Seed & Whitman (1970)

using a peak ground acceleration (PGA) of 0.379 g for 10% probability of exceedance in 50 years. As indicated in Section 1803.5.12 of the 2019 CBC, retaining walls supporting 6 feet of backfill or less are not required to be designed for seismic earth pressures. The values provided in the following table do not consider hydrostatic pressure. Retaining walls should also be designed to support adjacent surcharge loads imposed by other nearby footings or traffic loads in addition to the earth pressure.

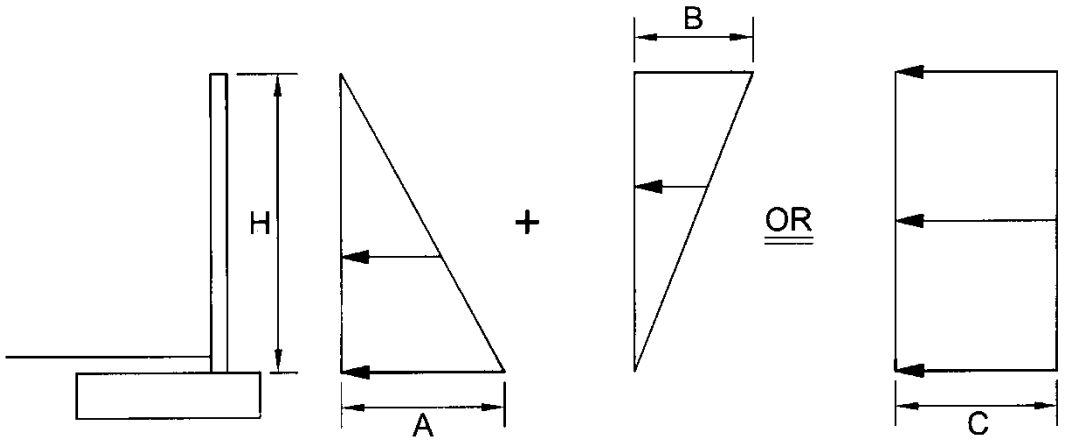
6.4.4 Drainage and Moisture-Proofing

Retaining walls should be constructed with a perforated pipe and gravel subdrain to prevent entrapment of water in the backfill. The perforated pipe should consist of 4-inch-diameter, ABS SDR-35 or PVC Schedule 40 with the perforations laid down. The pipe should be embedded in ¾- to 1½-inch open-graded gravel wrapped in filter fabric. The gravel should be at least one foot wide and extend at least one foot up the wall above the footing and drainage outlet. Drainage gravel and piping should not be placed below outlets and weepholes. Filter fabric should consist of Mirafi 140N, or equal. Outlet pipes should be directed to positive drainage devices.

The use of weepholes may be considered in locations where aesthetic issues from potential nuisance water are not a concern. Weepholes should be 2 inches in diameter and provided at least every 6 feet on center. Where weepholes are used, perforated pipe may be omitted from the gravel subdrain.

Retaining walls supporting backfill should also be coated with a moisture-proofing compound or covered with such material to inhibit infiltration of moisture through the walls. Moisture-proofing material should cover any portion of the back of wall that will be in contact with soil and should lap over and onto the top of footing. A drainage panel should be provided between the soil backfill and water proofing. The panel should extend from the top of the backdrain gravel up to within 12 inches of finish grade. The top of footing should be finished smooth with a trowel to inhibit the infiltration of water through the wall. The project structural engineer should provide specific recommendations for moisture-proofing, water stops, and joint details.

TABLE 6.4
SEISMIC EARTH PRESSURES
Pressure Diagram



Earth Pressure Values
Walls Up to 10 Feet in Height

Value	Backfill Condition	
	Level	2H:1V Slope
A	58H	70H
B	12H	12H
C	35H	41H

Note:
H is in feet and resulting pressure is in psf. Design may utilize either the sum of the static component and the seismic component force diagrams or the total force diagram above. SEAOSC has suggested using a load factor of 1.7 for the static component and 1.0 for the seismic component. The actual load factors should be determined by the structural engineer.

6.4.5 Footing Reinforcement

All continuous footings should be reinforced with a minimum of four No. 4 bars, two top and two bottom. The structural engineer may require different reinforcement and should dictate if greater than the recommendations provided herein.

6.4.6 Wall Jointing

All free-standing, exterior site walls should be provided with cold joints through the masonry block section at horizontal spacing generally not exceeding 15 feet. The joints should not extend through the footing. Retaining walls that are integral to the building should be provided joints based on recommendations by the structural engineer.

6.4.7 Footing Observations

Footing excavations should be observed by the project geotechnical consultant to verify that they have been excavated into competent bearing soils and to the minimum embedment recommended herein. These observations should be performed prior to placement of forms or reinforcement. The excavations should be trimmed neat, level, and square. Loose, sloughed or moisture-softened materials and debris should be removed prior to placing concrete.

6.4.8 Wall Backfill

Onsite soils may be used for backfill behind retaining walls. The project geotechnical consultant should approve the backfill used for retaining walls. Wall backfill should be thoroughly moistened to provide moisture contents slightly over optimum moisture content; placed in lifts no greater than 12 inches in thickness, and then mechanically compacted with appropriate equipment to at least 90 percent of the laboratory standard. Hand-operated compaction equipment should be used to compact the backfill placed immediately adjacent the wall to avoid damage to the wall.

6.5 EXTERIOR FLATWORK

Concrete sidewalks, patios, and similar flatwork should be a nominal 4.5 inches thick and provided with saw cuts or expansion joints at spacing no greater than 6 feet in each direction. Flatwork more than 6 feet in width across the minimum dimension should be reinforced with 6" by 6", W4 by W4 welded wire mesh or No 3 bars spaced 18 inches center to center in both directions. Cold joints should be keyed or provided with dowels spaced 24 inches on center. Flatwork that meets the structure at points of entry should be doweled into the footing or grade beam of the structure. Consideration should also be given to doweling flatwork into curbs where they meet. Special jointing detail should be provided in areas of block-outs, notches, or other irregularities to avoid cracking at points of high stress. Subgrade soils below flatwork should be thoroughly moistened to a moisture content of at least 120 percent of optimum to a depth of 12 inches. Moistening should be accomplished by lightly spraying the area over a period of a few days just prior to pouring concrete.

Drainage from flatwork areas should be directed to local area drains and/or other appropriate collection devices designed to carry runoff water to the street or other approved drainage structures. The concrete flatwork should also be sloped at a minimum gradient of 2% away from building foundations and masonry walls.

6.6 CONCRETE MIX DESIGN AND CORROSION

Laboratory testing of existing near-surface soils for soluble sulfate content indicates soluble sulfate concentration less than 0.10%. We recommend following the procedures provided in ACI 318, Section 4.3, Table 4.3.1 for **negligible** sulfate exposure. Upon completion of rough grading, an evaluation of as-graded conditions and further laboratory testing should be completed for the site to confirm or modify the recommendations provided in this section.

6.7 POST GRADING CONSIDERATIONS

6.7.1 Site Drainage and Irrigation

Positive drainage devices, such as sloping concrete flatwork, graded swales or area drains, should be provided around the new construction to collect and direct all surface water to suitable discharge areas. In general, the site should be graded to conform to the requirements of Section 1804.4 of the 2019 California Building Code. No rain or excess water should be directed toward or allowed to pond against structures such as walls, foundations, flatwork, etc.

Excessive irrigation water can be detrimental to the performance of the proposed site development. Water applied in excess of the needs of vegetation will tend to percolate into the ground. Such percolation can lead to nuisance seepage and shallow perched groundwater. Seepage can form on slope faces, on the faces of retaining walls, in streets, or other low-lying areas. These conditions could lead to adverse effects such as the formation of stagnant water that breeds insects, distress or damage of trees, surface erosion, slope instability, discoloration and salt buildup on wall faces, and premature failure of pavement. Excessive watering can also lead to elevated vapor emissions within buildings that can damage flooring finishes or lead to mold growth inside the home.

Key factors that can help mitigate the potential for adverse effects of overwatering include the judicious use of water for irrigation, use of irrigation systems that are appropriate for the type of vegetation and geometric configuration of the planted area, the use of soil amendments to enhance moisture retention, use of low-water demand vegetation, regular use of appropriate fertilizers, and seasonal adjustments of irrigation systems to match the water requirements of vegetation. Specific recommendations should be provided by a landscape architect or other knowledgeable professional.

6.7.2 Utility Trenches

Trench excavations should be constructed in accordance with the recommendations contained in Section 6.1.5 of this report. Trench excavations must also conform to the requirements of Cal/OSHA.

Trench backfill materials and compaction criteria should conform to the requirements of the local municipalities. As a minimum, utility trench backfill should be compacted to at least 90 percent of the laboratory standard. Trench backfill should be brought to moisture content slightly over optimum, placed in lifts no greater than 12 inches in thickness, and then mechanically compacted with appropriate equipment to at least 90 percent of the laboratory standard. The project geotechnical consultant should perform density testing, along with probing, to test compaction. Jetting should not be completed without prior approval from the project geotechnical consultant.

Within shallow trenches (less than 18 inches deep) where pipes may be damaged by heavy compaction equipment, imported clean sand having a SE of 30 or greater may be utilized. The sand should be placed in the trench, thoroughly watered, and then compacted with a vibratory compactor. For utility trenches located below a 1:1 (H:V) plane projecting downward from the outside edge of the adjacent footing base or crossing footing trenches, concrete or slurry should be used as trench backfill.

6.8 PRELIMINARY PAVEMENT DESIGN

6.8.1 Preliminary Structural Sections

Based on the soil conditions present at the site and estimated traffic indices, preliminary pavement sections are provided in Table 6.5 below. A preliminary "R-value" of 5 was used for the near-surface soil in this preliminary pavement design. The sections provided below are for planning purposes only and should be re-evaluated subsequent to site grading. Final pavement sections should be based on actual R-value testing of in-place soils and analysis of anticipated traffic.

6.8.2 Subgrade Preparation

Prior to placement of pavement elements, subgrade soils should be moisture-conditioned to at least 120 percent of the optimum moisture content then compacted to at least 90 percent of the laboratory determined maximum dry density. Areas observed to pump or yield under vehicle traffic should be removed and replaced with firm and unyielding compacted soil or aggregate base materials.

TABLE 6.5
PRELIMINARY PAVEMENT STRUCTURAL SECTIONS
FOR RESIDENTIAL DEVELOPMENT

Location	Traffic Index	AC (inches)	Paver Thickness (mm)	Portland Cement Concrete (inches)	AB (inches)
Main Street	5.0	3.0 4.0	--	--	11.0 8.0
		--	80	--	12.0
		--	--	7.3	--
Parking Stalls	--	3.0	--	---	5.0

6.8.3 Aggregate Base

Aggregate base should be moisture conditioned to slightly over the optimum moisture content, placed in lifts no greater than 6 inches in thickness, then compacted to at least 95 percent of the laboratory standard (ASTM D 1557). Aggregate base materials should be Class 2 Aggregate Base conforming to Section 26-1 of the latest edition of the Caltrans Standard Specifications, Crushed Aggregate Base conforming to Section 200-2.2 of the latest edition of the Standard Specifications for Public Works Construction (Greenbook) or Crushed Miscellaneous Base conforming to Section 200-2.4 of the Greenbook.

6.8.4 Asphaltic Concrete

Paving asphalt should be PG 64-10. Asphaltic concrete materials should conform to Section 203-6 of the Greenbook and construction should conform to Section 302 of the Greenbook. Where traffic will traverse over cold joints in asphaltic concrete such as against concrete ribbon gutters and concrete paver sections, the asphaltic concrete section should be thickened by 1 additional inch from the values indicated in the above Table 6.5 within 2 feet of cold joints.

6.8.5 Concrete Pavers

Concrete pavers should conform to the requirements of ASTM C 936. Construction of the pavers, including bedding sand, should follow manufacturer's specifications. Typical thickness of bedding sand is about 1 inch. The gradation of bedding sand should meet the requirement in Table 6.6.

TABLE 6.6
Gradation for Sand Bedding

Sieve Size	Percent Passing
⅜"	100
No. 4	95 - 100
No. 8	80 - 100
No. 16	50 - 85

No. 30	25 - 60
No. 50	5 - 30
No. 100	0 - 10
No. 200	0 - 1

Construction of edge restraints should also follow manufacturer's specifications. As a minimum, restraints should be provided along the perimeter of concrete pavers and where there is a change in the paving materials. The proposed concrete bands should extend to the bottom of the base course underlying the concrete pavers. Portland cement concrete used to construct concrete bands should conform to Section 201 of the Greenbook and should have a minimum compressive strength of 2,500 pounds per square inch (psi) at 28 days. Reinforcement and jointing of concrete pavement sections should be designed according to the minimum recommendations provided by the Portland Cement Association (PCA). For rigid pavement, transverse and longitudinal contraction joints should be provided at spacing no greater than 15 feet. Score joints may be constructed by saw cutting to a depth of ¼ of the slab thickness. Expansion/cold joints may be used in lieu of score joints. However, cold joints should be provided with dowels or keyways are recommended by PCA.

6.8.6 Portland Cement Concrete (PCC)

Portland cement concrete used to construct concrete paving should conform to Section 201 of the Greenbook and should have a minimum compressive strength of 3,500 pounds per square inch (psi) at 28 days. Reinforcement and jointing of concrete pavement sections should be designed according to the minimum recommendations provided by the Portland Cement Association (PCA). For rigid pavement, transverse and longitudinal contraction joints should be provided at spacing no greater than 15 feet. Score joints may be constructed by saw cutting to a depth of ¼ of the slab thickness. Expansion/cold joints may be used in lieu of score joints. Such joints should be properly sealed. Where traffic will traverse over cold joints or edges of concrete paving, the edges should be thickened by 20% of the design thickness toward the edge over a horizontal distance of 5 feet.

Trash pickup areas should be provided with a concrete slab where the bins will be picked up and extend at least 3 feet past the front wheel landing areas. The slab should be at least 8 inches thick and be reinforced with No. 4 bars spaced at 24 inches on centers, both ways. The slabs should be provided transverse and longitudinal joints spacing as specified above. Dowels or a keyway should be provided at all cold joints.

6.9 PLAN REVIEW AND CONSTRUCTION SERVICES

We recommend *Albus & Associates, Inc*. be engaged to review any future development plans, including revisions to the grading plans, foundation plans and proposed structural loads, prior to construction. This is to verify that the assumptions of this report are valid and that the preliminary conclusions and recommendations contained in this report have been properly interpreted and are incorporated into the project plans and specifications. If we are not provided the opportunity to review these documents, we take no responsibility for misinterpretation of our preliminary conclusions and recommendations.

We recommend that a geotechnical consultant be retained to provide soil engineering services during construction of the project. These services are to observe compliance with the design, specifications or recommendations, and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

If the project plans change significantly from the assumed development described herein, the project geotechnical consultant should review our preliminary design recommendations and their applicability to the revised construction. If conditions are encountered during construction that appear to be different than those indicated in this report or subsequent design reports, the project geotechnical consultant should be notified immediately. Design and construction revisions may be required.

7.0 LIMITATIONS

This report is based on the proposed development and geotechnical data as described herein. The materials described herein and in other literature are believed representative of the total project area, and the conclusions contained in this report are presented on that basis. However, soil materials can vary in characteristics between points of exploration, both laterally and vertically, and those variations could affect the conclusions and recommendations contained herein. As such, observation and testing by a geotechnical consultant prior to and during the grading and construction phases of the project are essential to confirming the basis of this report.

This report summarizes several geotechnical topics that should be beneficial for project planning and budgetary evaluations. The information presented herein is intended only for a preliminary feasibility evaluation and is not intended to satisfy the requirements of a site specific and detailed geotechnical investigation required for further planning and permitting.

This report has been prepared consistent with that level of care being provided by other professionals providing similar services at the same locale and time period. The contents of this report are professional opinions and as such, are not to be considered a guaranty or warranty.

This report should be reviewed and updated after a period of one year or if the site ownership or project concept changes from that described herein.

This report has been prepared for the exclusive use of **The Olson Company** to assist the project consultants in determining the feasibility of the proposed development. This report has not been prepared for use by parties or projects other than those named or described herein. This report may not contain sufficient information for other parties or other purposes.

Respectfully submitted,

ALBUS & ASSOCIATES, INC

Paul Hyun Jin Kim
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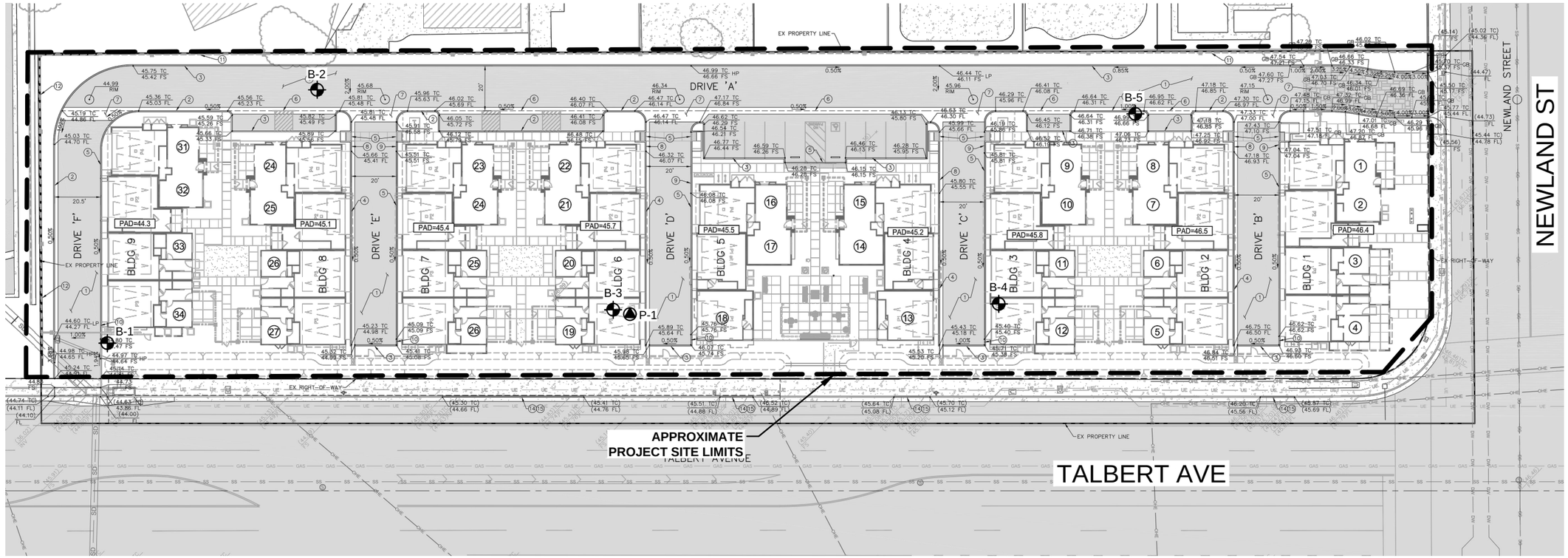
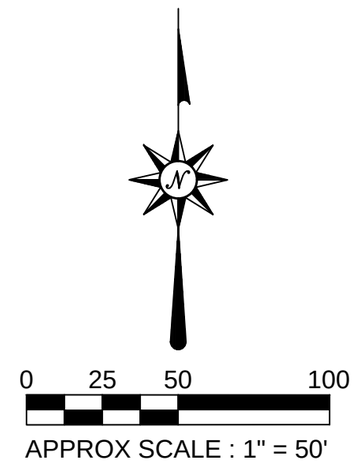
Plans

Rough Grading Plan for Tentative Tract Map No. 19157, prepared by Advanced Civil Group



Base Plan Provided by Advanced Civil



APPROX SCALE : 1" = 50'

EXPLANATION

(Locations Approximate)

- Exploratory Boring
- Percolation Test Boring

ALBUS ASSOCIATES

GEOTECHNICAL MAP

Job No.: 2949.00	Date: 02/24/2022	Plate: 1

APPENDIX A

EXPLORATION LOGS

Field Identification Sheet

Light gray

Gray

Dark gray

Gray Brown

Light brown

Brown

Dark Brown

Olive brown

Olive

Yellow

Yellowish brown

Yellowish red

Red

Reddish Brown

Tan

Description Order:

Description, Color, Moisture, Density, Grain Size, Additional Description

Description	%	Example
	0-5	Sand
trace	5-15	Sand trace Silt
with	15-30	Sand with Silt
	30+	Silty Sand

More Examples

Sand with Silt trace Clay

Sand trace Silt and Clay

Sand with Silt and Clay

Gravelly Sand with Silt trace Clay

Silty Clay with Sand trace Gravel

Moisture

Dry	absence of water
Damp	below optimum
Moist	near optimum
Very Moist	above optimum
Wet	free water visible

Density (Navfac)

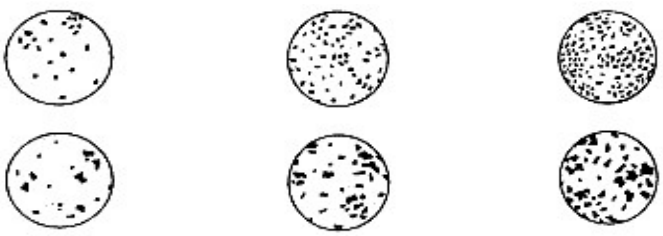
Coarse grained soils	SPT	CA
Very Loose	0-3	0-5
Loose	3-8	5-13
Medium Dense	8-14	13-22
Dense	14-25	22-40
Very Dense	25>	40>
Fine grained soils		
Very Soft	2<	0-3
Soft	2-4	3-6
Medium Stiff	4-8	6-13
Stiff	8-15	13-24
Very Stiff	15-30	24-48
Hard	30>	48>

Grain Size

Description		Sieve Size	Approx. Size
Boulders		>12"	Larger than basketball
Cobbles		3-12"	Fist to basketball
Gravel	coarse	3/4-3"	Thumb to Fist
	fine	#4-3/4"	Pea to Thumb
Sand	coarse	#10-4	Rock Salt to Pea
	medium	#40-10	Sugar to Rock Salt
	fine	#200-40	Flour to Sugar
Fines		Pass #200	Smaller than Flour

Additional Description (ie. roots, pinhole pores, debris, etc.)

Trace 5% Moderate 15% Abundant 30%



EXPLORATION LOG

Project:		Location:
Address:		Elevation:
Job Number:	Client:	Date:
Drill Method:	Driving Weight:	Logged By:

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
5		**EXPLANATION** Solid lines separate geologic units and/or material types. Dashed lines indicate unknown depth of geologic unit change or material type change. **Solid black rectangle** in Core column represents California Split Spoon sampler (2.5in ID, 3in OD). **Double triangle** in core column represents SPT sampler. **Vertical Lines** in core column represents Shelby sampler. **Solid black rectangle** in Bulk column respresents large bag sample. **Other Laboratory Tests:** Max = Maximum Dry Density/Optimum Moisture Content EI = Expansion Index SO4 = Soluble Sulfate Content DSR = Direct Shear, Remolded DS = Direct Shear, Undisturbed SA = Sieve Analysis (1" through #200 sieve) Hydro = Particle Size Analysis (SA with Hydrometer) 200 = Percent Passing #200 Sieve Consol = Consolidation SE = Sand Equivalent Rval = R-Value ATT = Atterberg Limits							
10									
15									
20									

EXPLORATION LOG

Project: Huntington Beach (Talbert & Newland)		Location: B-1
Address: 8371 Talbert Ave, Huntington Beach, CA 92647		Elevation: 44.3
Job Number: 2949.00	Client: The Olson Company	Date: 1/15/2021
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: ddalbus

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		ARTIFICIAL FILL (Af) Silty Sand (SM): Brown, damp to moist, fine to medium grained sand							
		Silty Sand with Gravel (SM): Light brown, dry to damp, dense, fine to medium grained sand, glass, asphalt, trace root hairs		62			8.6	113.6	
5		@ 4 ft, glass		45			8.1	113.9	
		Silty Sand (SM): Brown, damp to moist, medium dense, fine to medium grained sand, trace pinhole pores and roots, possible glass		20			7.3	111.8	Consol
		VERY OLD MARINE DEPOSIT (Qvom) Silty Sand (SM): Brown, damp to moist, fine to medium grained sand							
10		@ 10 ft, dense		41			8.7	115.5	
15		Silty Sand (SM): Yellow, damp, very dense, fine to coarse grained sand, significant fines		57					
20		@ 20 ft, fine grained sand		39					

EXPLORATION LOG

Project: Huntington Beach (Talbert & Newland)		Location: B-1
Address: 8371 Talbert Ave, Huntington Beach, CA 92647		Elevation: 44.3
Job Number: 2949.00	Client: The Olson Company	Date: 1/15/2021
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: ddalbus

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		@ 25 ft, Light brown, damp to moist		64					
30				38					
35		Sandy Silt (ML): Olive brown, very moist, medium dense, fine grained sand		16					
		Sand with Silt (SP): Grayish brown, wet, medium dense, fine grained sand	▽						
40		@ 40 ft, very dense		53					
45		Silty Sand trace Clay (SM): Grayish brown, wet, very dense, fine grained sand		41					

Albus & Associates, Inc.

Plate A-3

EXPLORATION LOG

Project: Huntington Beach (Talbert & Newland)		Location: B-1
Address: 8371 Talbert Ave, Huntington Beach, CA 92647		Elevation: 44.3
Job Number: 2949.00	Client: The Olson Company	Date: 1/15/2021
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: ddalbus

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		Sand with Silt (SP): Grayish brown, wet, very dense, fine grained sand		33					
		Silty Sand trace Clay (SM): Grayish brown, wet, very dense, fine grained sand							
		Total Depth 51.5ft Groundwater at 38ft Boring backfilled with soil cuttings							

EXPLORATION LOG

Project: Huntington Beach (Talbert & Newland)		Location: B-2
Address: 8371 Talbert Ave, Huntington Beach, CA 92647		Elevation: 46.4
Job Number: 2949.00	Client: The Olson Company	Date: 1/15/2021
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: ddalbus

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		VERY OLD MARINE DEPOSIT (Qvom) Clay (CL): Reddish brown, damp, very stiff, weathered, trace pinhole pores and roots, calcium carbonate		41	■		12.1	119.5	
5		Clayey Sand (SC): Light reddish brown, damp, hard, fine to medium grained sand		98	■		11.7	123.9	Consol
		@ 6 ft, less clay, trace pinhole pores and rootlets		35	■		7	111	
		Sand trace Clay (SP): Light reddish brown, damp, medium dense, fine to medium grained sand, trace rootlets							
10		Sand (SP): Light reddish brown to light yellow, damp, medium dense, fine grained sand		17	■		6.2	105.9	
		Total Depth 11.5ft No Groundwater Boring backfilled with soil cuttings							

EXPLORATION LOG

Project: Huntington Beach (Talbert & Newland)		Location: B-3
Address: 8371 Talbert Ave, Huntington Beach, CA 92647		Elevation: 45.4
Job Number: 2949.00	Client: The Olson Company	Date: 1/15/2021
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: ddalbus

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		VERY OLD MARINE DEPOSIT (Qvom)							Max EI SO4 DS ATT pH Resist Ch
		Clay (CL): Reddish brown, damp, weathered, trace pinhole pores and roots, calcium carbonate							
		@ 2 ft, hard		61			13	119.2	
		Clayey Sand (SC): Light reddish brown, damp, hard, fine to medium grained sand, trace rootlets		71			13.4	119	
5		Sand with Clay (SP): Light reddish brown, damp, medium dense, fine to medium grained sand, trace pinhole pores		24			6.3	104.4	
10		Sand (SP): Light reddish brown, damp, medium dense, fine to coarse grained sand		26			2.8	99	200
15		@ 15 ft, very dense		40					
20				42					SA

Albus & Associates, Inc.

Plate A-6

EXPLORATION LOG

Project: Huntington Beach (Talbert & Newland)		Location: B-3
Address: 8371 Talbert Ave, Huntington Beach, CA 92647		Elevation: 45.4
Job Number: 2949.00	Client: The Olson Company	Date: 1/15/2021
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: ddalbus

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		Sand trace Silt (SP): Light brown, damp, very dense, fine grained sand		46					
30				30					200
		Total Depth 31.5ft No Groundwater Boring backfilled with soil cuttings Percolation Well (10ft offset): 0-15 ft solid 3" pipe 15-20 ft perforated 3" pipe							

EXPLORATION LOG

Project: Huntington Beach (Talbert & Newland)		Location: B-4
Address: 8371 Talbert Ave, Huntington Beach, CA 92647		Elevation: 44.9
Job Number: 2949.00	Client: The Olson Company	Date: 1/15/2021
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: ddalbus

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		VERY OLD MARINE DEPOSIT (Qvom) Clay (CL): Reddish brown, damp, weathered, trace pinhole pores and roots, calcium carbonate							
		@ 2 ft, hard		53	■		8.8	122.5	
5		Sand with Clay (SC): Light reddish brown, dry to damp, medium dense, fine to coarse grained sand, trace pinhole pores and rootlets		25	■		3.4	110	
		@ 6 ft, trace Clay		16	■		1.7	106.6	Consol
		Sand (SP): Light reddish brown, damp, medium dense, fine to coarse grained sand							
10				35	■		2.4	102.5	
		Total Depth 11.5ft No Groundwater Boring backfilled with soil cuttings							

EXPLORATION LOG

Project: Huntington Beach (Talbert & Newland)		Location: B-5
Address: 8371 Talbert Ave, Huntington Beach, CA 92647		Elevation: 44.9
Job Number: 2949.00	Client: The Olson Company	Date: 1/15/2021
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: ddalbus

Depth (feet)	Lith-ology	Material Description	Water	Samples: Blows Per Foot	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		VERY OLD MARINE DEPOSIT (Qvom) Clay (CL): Reddish brown, damp, weathered, trace pinhole pores and roots, calcium carbonate							
		@ 2 ft, very stiff		23	■		11.8	109.9	
				59	■		10.2	120.1	Consol
5		Clayey Sand (SC): Light brown, dense							
		Sand with Clay (SC): Light reddish brown, damp, medium dense, fine to coarse grained sand, trace rootlets		16	■		2.2	105.5	
		@ 7 ft, trace Clay							
10		Sand (SP): Light reddish brown, damp, medium dense, fine to coarse grained sand		21	■		1.9	106.5	
		Total Depth 11.5ft No Groundwater Boring backfilled with soil cuttings							

APPENDIX B

LABORATORY TEST PROGRAM

LABORATORY TESTING PROGRAM

Soil Classification

Soils encountered within the exploratory borings were initially classified in the field in general accordance with the visual-manual procedures of the Unified Soil Classification System (ASTM D 2487). The samples were re-examined in the laboratory and classifications reviewed and then revised where appropriate. The assigned group symbols are presented on the Exploration Logs provided in Appendix A.

In Situ Moisture and Density

Moisture content and unit dry density of in-place soil materials were determined in representative strata. Test data are summarized in the Boring Logs, Appendix A.

Maximum Dry Density and Optimum Moisture Content

Maximum dry density and optimum moisture content were performed on representative samples of the site materials obtained from our field explorations. The test was performed in accordance with ASTM D 1557. Pertinent test values are given in Table B.

Expansion Potential

An Expansion Index test was performed on a selected sample in accordance with ASTM D 4829. The test result and expansion potential are presented in Table B.

Soluble Sulfate Content

Chemical analysis was performed on selected samples to determine soluble sulfate content. The test was performed in accordance with California Test Method No. 417. The test result is included on Table B.

Particle Size Analyses

Particle size analyses were performed on representative samples of site materials in accordance with ASTM D 422-63. The results are presented graphically on the attached Plates B-1 and B-2.

Consolidation

Consolidation tests were performed for selected soil samples in general conformance with ASTM D 2435. Axial loads were applied in several increments to a laterally restrained 1-inch-high sample. Loads were applied in geometric progression by doubling the previous load, and the resulting deformations were recorded at selected time intervals. Results of the tests are graphically presented on Plates B-3 and B-4.

Direct Shear

The Coulomb shear strength parameters, angle of internal friction and cohesion, were determined for a bulk sample obtained from one our borings. Our laboratory performed the test in general conformance with Test Method ASTM D 3080. The sample was remolded to 90 percent of maximum dry density and 2 percentage points over optimum. Three specimens were prepared for each test,

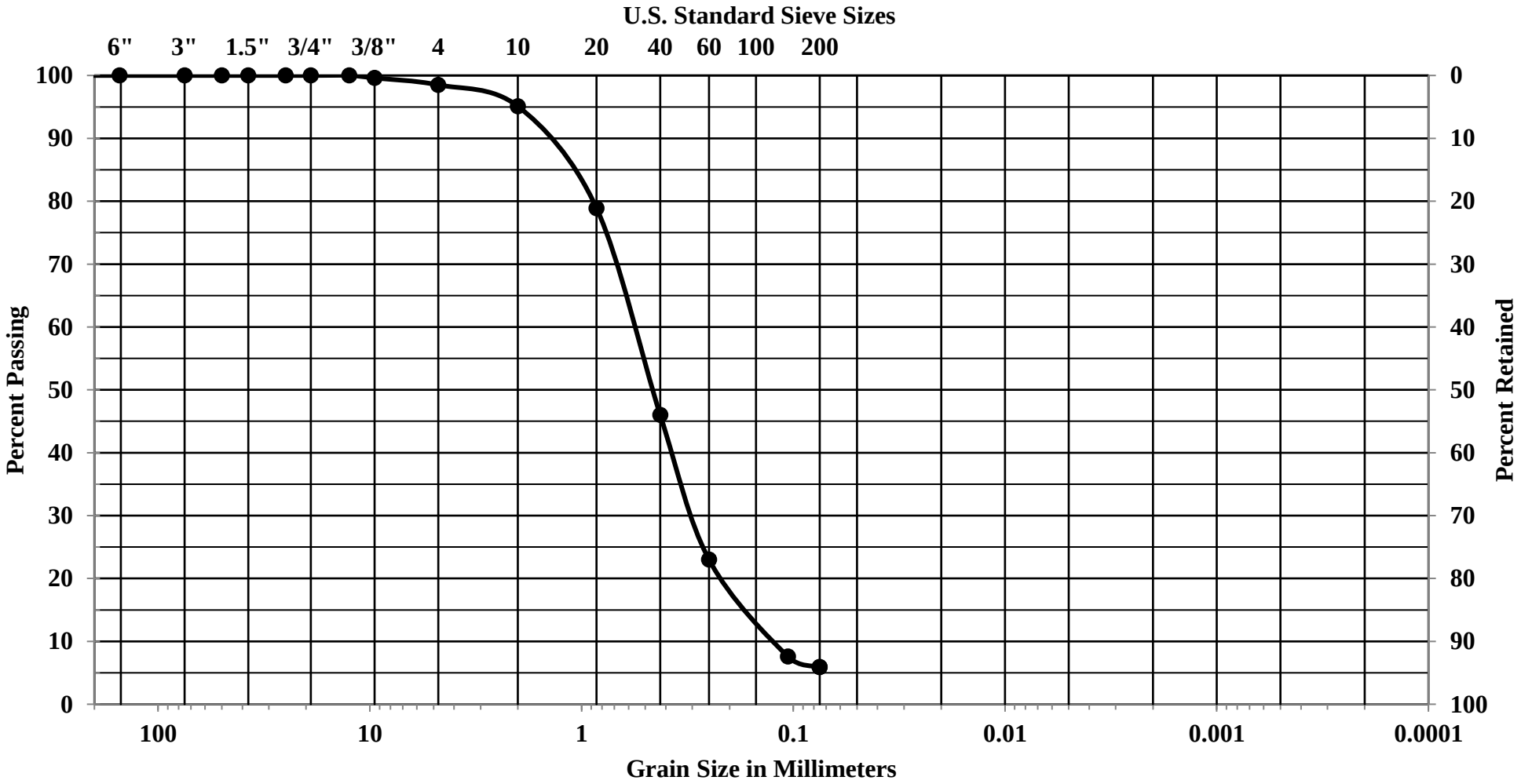
artificially saturated, and then sheared under varied loads at an appropriate constant rate of strain. Results are graphically presented on Plate B-5.

TABLE B
SUMMARY OF LABORATORY TEST RESULTS

Boring No.	Sample Depth (ft)	Soil Description	Test Results	
B-3	0-5	Sandy Clay (CL)	Max. Dry Density (pcf): Opt. Moisture Content (%): Expansion Index: Expansion Potential: Soluble Sulfate Content: Sulfate Exposure: PH: Chloride content (ppm): Resistivity (ohms): Liquid Limit (%): Plasticity Index (%):	124.0 12.0 81 Medium 0.003 % Negligible 7 121 1200 34 19
B-3	10	Sand (SP)	Passing No. 200 Sieve:	4.7
B-3	30	Sand trace Silt (SP)	Passing No. 200 Sieve:	10.3

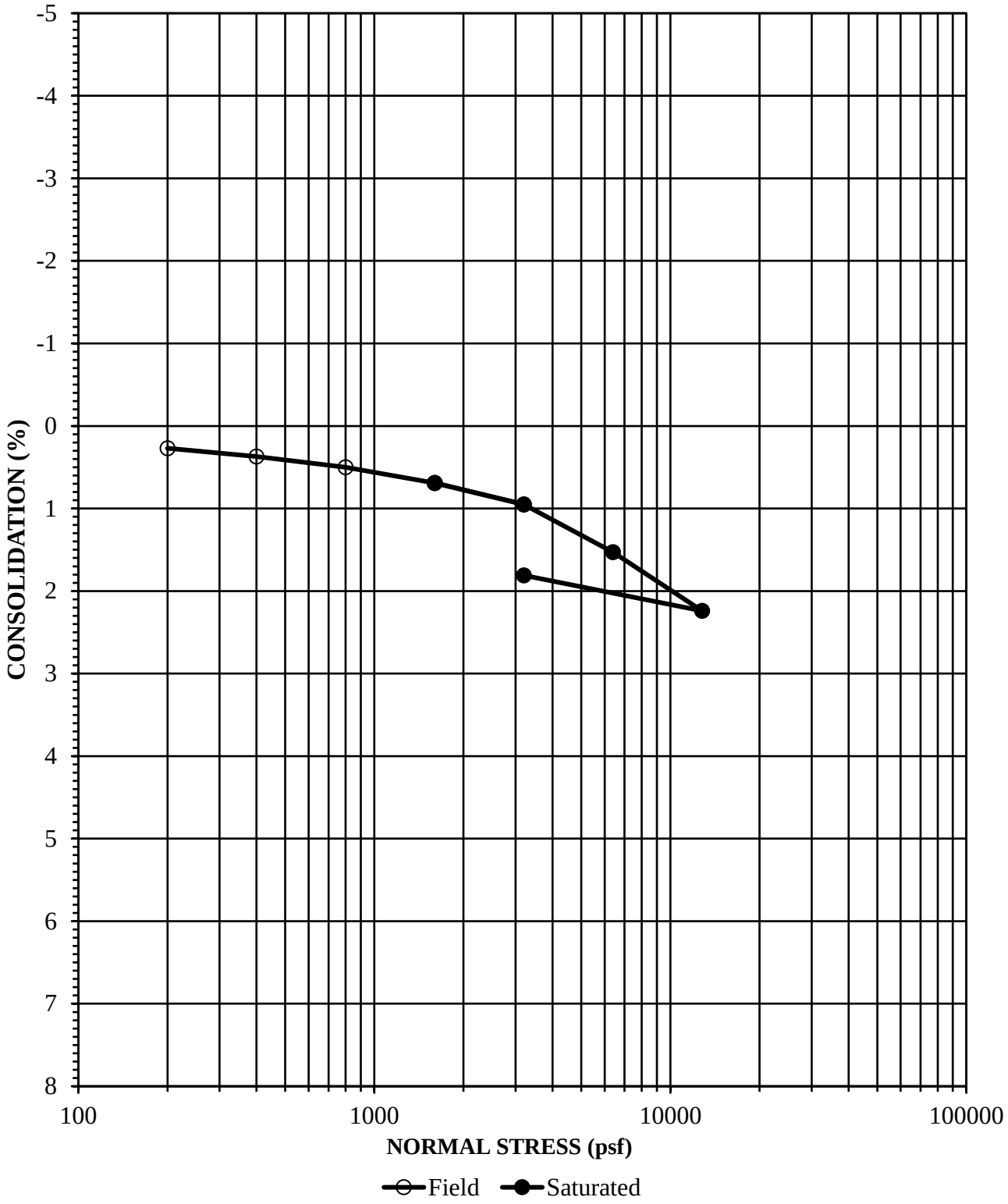
GRAIN SIZE DISTRIBUTION

COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



Job Number	Location	Depth	Description
2949.00	B-3	20	Sand trace Silt

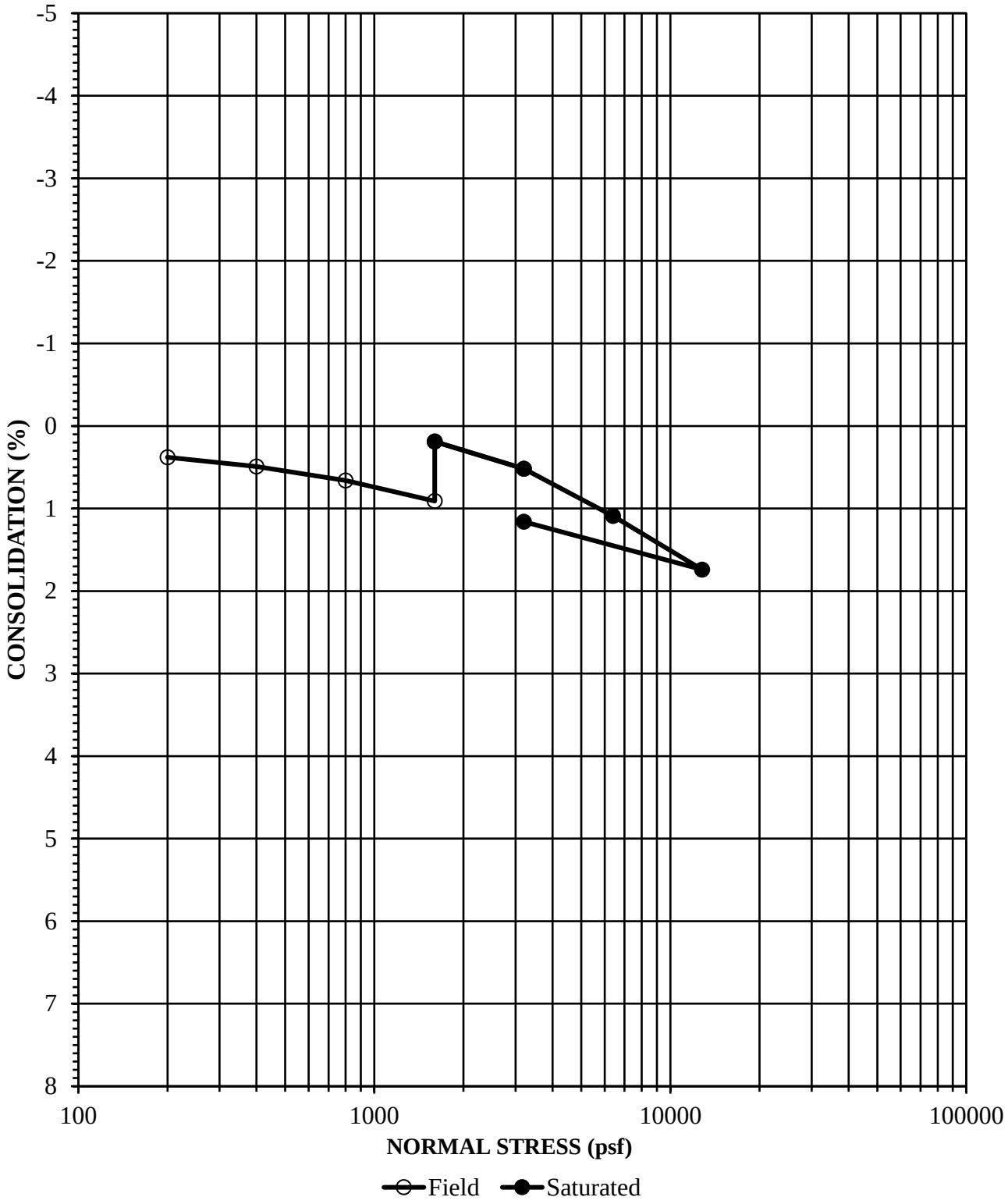
CONSOLIDATION



Job Number	Location	Depth	Description
2949.00	B-1	6	Silty Sand trace Clay

Initial Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Concent (%)
118.4	6.9	14.5

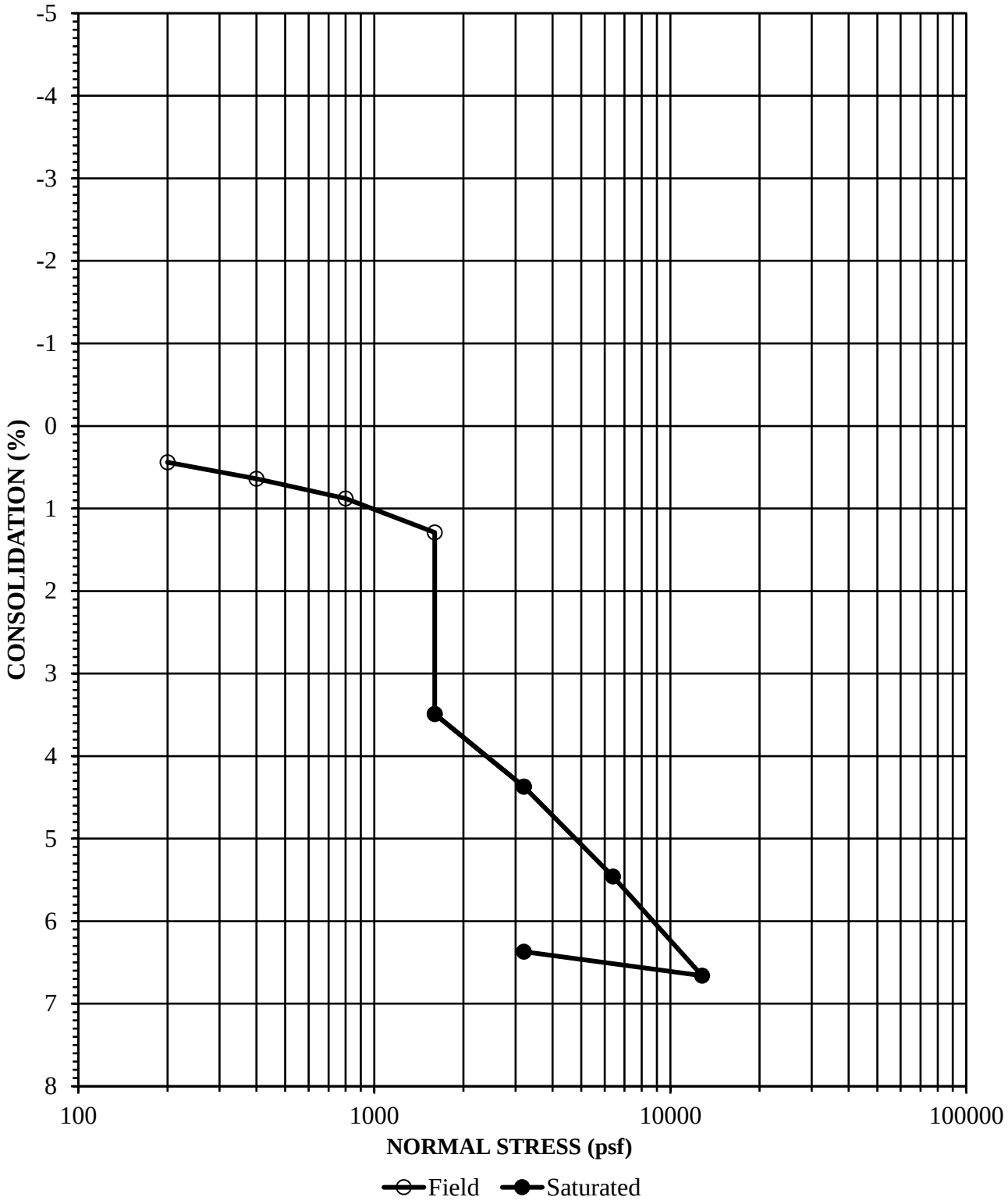
CONSOLIDATION



Job Number	Location	Depth	Description
2949.00	B-2	4	Clayey Sand

Initial Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Concent (%)
125.2	8.3	12.2

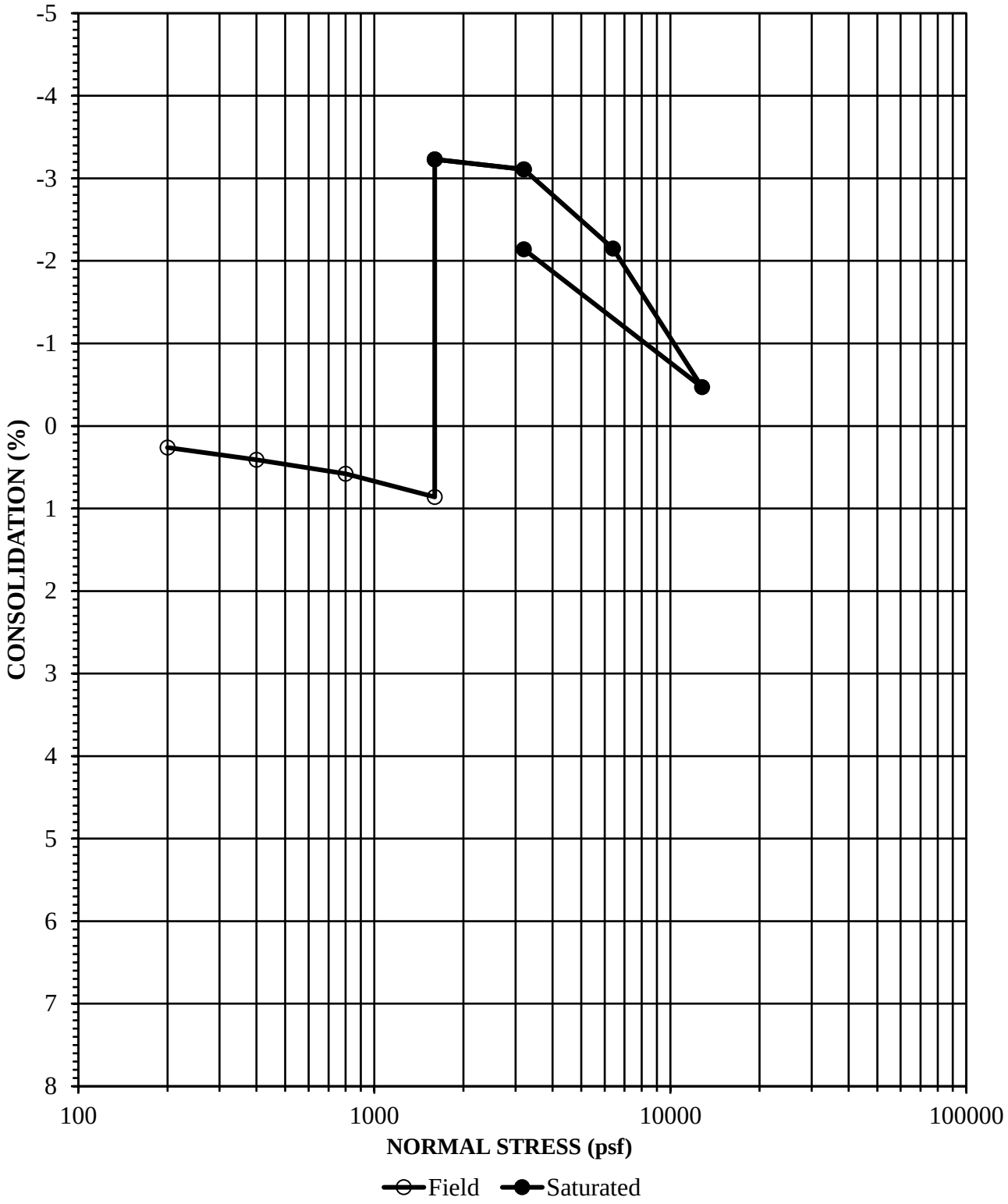
CONSOLIDATION



Job Number	Location	Depth	Description
2949.00	B-4	6	Sand with Clay and Gravel

Initial Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Concent (%)
100.1	4.1	17.2

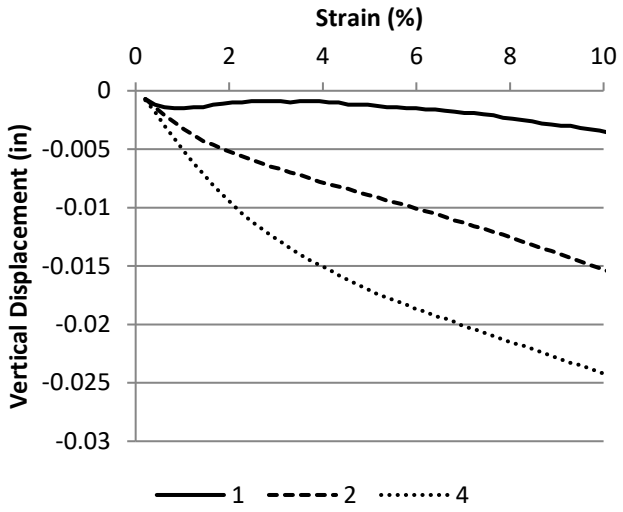
CONSOLIDATION

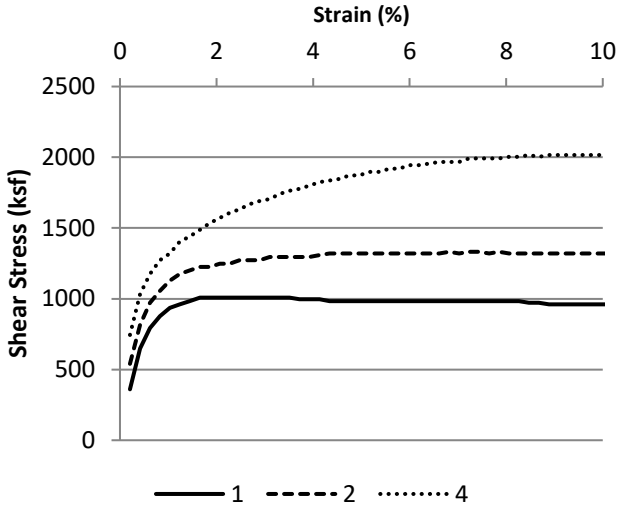


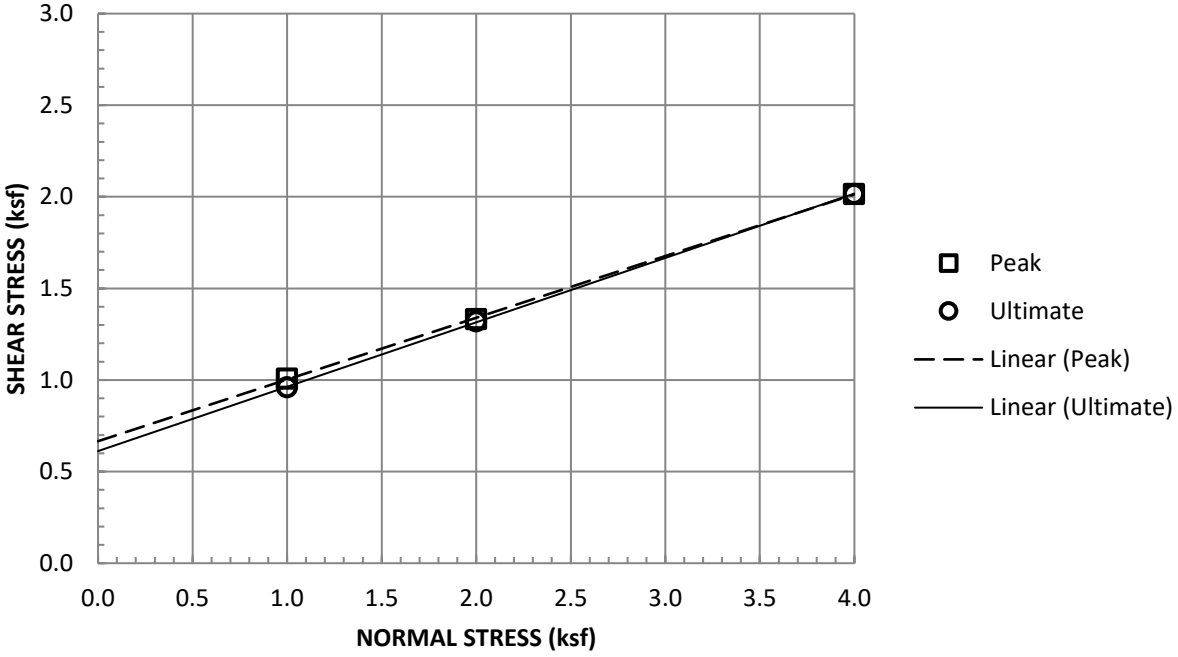
Job Number	Location	Depth	Description
2949.00	B-5	4	Clay

Initial Dry Density (pcf)	Initial Moisture Content (%)	Final Moisture Concent (%)
120.4	13.3	16.8

DIRECT SHEAR







Sample Type:	,		
Normal Stress (ksf)	1	2	4
Peak Shear Stress (ksf)	1.008	1.332	2.016
Peak Displacement (in)	0.004	0.016	0.025
Ultimate Shear Stress (ksf)	0.96	1.32	2.016
Ultimate Displacement (in)	0.25	0.25	0.25
Initial Dry Density (pcf)	112.1	112.1	112.1
Initial Moisture Content (%)	11.5	11.5	11.5
Final Moisture Content (%)	18	17.6	17.4
Strain Rate (in/min)	.005		

Job Number	Location	Depth	Description
2949.00	B-3	0-5	Sandy Clay

APPENDIX C

LIQUEFACTION ANALYSIS

TABLE C-1

ANALYSIS OF LIQUEFACTION POTENTIAL
BORING: B-1 (2%PE in 50 yrs; FS=1.3)

Client: Olson
J.N. 2949.00
Site: Huntington Beach

Hammer Type (D,S,A)	A	[Ce= D 0.75, S 0.95, A Hammer Efficiency]			
Boring Diameter, ID (in)	4				
Site Acceleration (g)	0.719	PGAm w/o MSF			
for a Magnitude (Mw) of	6.79	Corresponding to 2%PE in 50 yrs			
and MSF of	1.34		Analysis Type:	General	
Depth to High GW	30.0	ft.	FS for Liquefaction:	1.3	
Depth to GW during invest.	38.0	ft.	FS for Liqu. Settlement:	1.3	
Hammer Efficiency	84.1	%	PI Threshold for Liquefaction:	12	
Sublayer Thickness	1.0	ft.	Min. Moisture Cnt for Liqu. (%LL)	85	
Depth of Analysis	50.0	ft.	Max FS for Plotting:	5.0	

Layer Label (Auto)	Depth Interval (ft) Top	Depth Interval (ft) Bottom	Layer Mid-Depth (ft)	Soil Type (USCS)	Fines <#200 Sieve (%)	LL (%)	PI	M (%)	Field Nf (bls/ft)	Sample Type SPT/CA	Soil Wet Density (pcf)
1	0.0	3.5	1.8	SM	30				62	CA	120
2	3.5	5.5	4.5	SM	30				45	CA	120
3	5.5	8.5	7.0	SM	30				20	CA	120
4	8.5	13.5	11.0	SM	30				41	CA	120
5	13.5	18.5	16.0	SM	30				57	SPT	120
6	18.5	23.5	21.0	SM	30				39	SPT	120
7	23.5	28.5	26.0	SM	30				64	SPT	120
8	28.5	33.5	31.0	SM	30				38	SPT	120
9	33.5	38.5	36.0	ML	60				16	SPT	120
10	38.5	43.5	41.0	SP	5				53	SPT	120
11	43.5	48.5	46.0	SP	5				41	SPT	120
12	48.5	51.5	50.0	SP	5				33	SPT	120

TABLE C-2
ANALYSIS OF LIQUEFACTION POTENTIAL
BORING: B-1 (2%PE in 50 yrs; FS=1.3)

Client: Olson
J.N. 2949.00
Site: Huntington Beach

SM

Hammer Type (D,S,A)	A		
Boring Diameter, ID (in)	8		
Site Acceleration (g)	0.719		
for a Magnitude (Mw) of	6.79		
and MSF of	1.34		
Depth to High GW	30	ft.	FS for Liquefaction: 1.3
Depth to GW during invest.	38	ft.	FS for Liqu. Settlement: 1.3
Hammer Efficiency	84.1	%	PI Threshold for Liquefaction: 12
Sublayer Thickness	1	ft.	Moisture Cnt Threshold for Liqu. (%LL) 85
Depth of Boring	50	ft.	

Notes: Underlined numbersare estimated values.
(1) Based on current groundwater conditions at the time of investigation.
(2) Based on assumed/proposed high groundwater conditions.
(3) Kα=1.0

(4) A Layer is located above historically high groundwater
B Factor of Saftey is greater than the specified value of FS=1.3
C The $(N_1)_{60\text{-}cs}$ is greater than 30 blows per foot
D PI > 12 or the in situ moisture content (M%) < 85% LL

Reference: Youd, T.L., et.al., (2001), "Liquefaction Resistance of Soils: Summary Report From The 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils", ASCE Journal of Geotechnical and Geoenvironmental Engineering, Vol.127, No.10, pp.817-833, October, 2001.

Layer Label	Depth Interval (ft) Top	Depth Interval (ft) Bottom	Layer Mid-Depth (ft)	Soil Type (USCS)	Fines <#200 Sieve (%)	LL (%)	PI	M (%)	Field Nf (bls/ft)	Sample Type SPT/CA	Soil Wet Density (pcf)	Total Stress (psf)(1)	Effec. Stress (psf)(1)	C_n	C_e	C_b	C_r	C_L	$(N_1)_{60}$ (lbs/ft)	α	β	$(N_1)_{60\text{-}cs}$ (lbs/ft)	Effec. Stress (psf)(2)	R_d	CRR (M=7.5)	Kσ	CSR	FS (3)	To Liquefy Y/N?	Reason(4) not Liquifiable
																												1.30		
1	0.0	1.0	0.5	SM	30				62	CA	120	60	60	1.7	1.40	1.15	0.75	1.0	71.4	4.7	1.15	87.1	60	1.00	NA	1.00	0.46	NA	N	A
1	1.0	2.0	1.5	SM	30				62	CA	120	180	180	1.7	1.40	1.15	0.75	1.0	71.4	4.7	1.15	87.1	180	1.00	NA	1.00	0.46	NA	N	A
1	2.0	3.0	2.5	SM	30				62	CA	120	300	300	1.6	1.40	1.15	0.75	1.0	68.7	4.7	1.15	84.0	300	0.99	NA	1.00	0.46	NA	N	A
1	3.0	3.5	3.3	SM	30				62	CA	120	390	390	1.6	1.40	1.15	0.75	1.0	66.6	4.7	1.15	81.6	390	0.99	NA	1.00	0.46	NA	N	A
2	3.5	4.5	4.0	SM	30				45	CA	120	480	480	1.5	1.40	1.15	0.75	1.0	46.9	4.7	1.15	58.8	480	0.99	NA	1.00	0.46	NA	N	A
2	4.5	5.5	5.0	SM	30				45	CA	120	600	600	1.5	1.40	1.15	0.75	1.0	45.1	4.7	1.15	56.7	600	0.99	NA	1.00	0.46	NA	N	A
3	5.5	6.5	6.0	SM	30				20	CA	120	720	720	1.4	1.40	1.15	0.75	1.0	19.3	4.7	1.15	27.0	720	0.99	NA	1.00	0.46	NA	N	A
3	6.5	7.5	7.0	SM	30				20	CA	120	840	840	1.4	1.40	1.15	0.80	1.0	19.8	4.7	1.15	27.6	840	0.98	NA	1.00	0.46	NA	N	A
3	7.5	8.5	8.0	SM	30				20	CA	120	960	960	1.3	1.40	1.15	0.80	1.0	19.1	4.7	1.15	26.8	960	0.98	NA	1.00	0.46	NA	N	A
4	8.5	9.5	9.0	SM	30				41	CA	120	1080	1080	1.3	1.40	1.15	0.85	1.0	40.3	4.7	1.15	51.2	1080	0.98	NA	1.00	0.46	NA	N	A
4	9.5	10.5	10.0	SM	30				41	CA	120	1200	1200	1.2	1.40	1.15	0.85	1.0	39.0	4.7	1.15	49.7	1200	0.98	NA	1.00	0.46	NA	N	A
4	10.5	11.5	11.0	SM	30				41	CA	120	1320	1320	1.2	1.40	1.15	0.85	1.0	37.8	4.7	1.15	48.3	1320	0.97	NA	1.00	0.46	NA	N	A
4	11.5	12.5	12.0	SM	30				41	CA	120	1440	1440	1.2	1.40	1.15	0.85	1.0	36.6	4.7	1.15	47.0	1440	0.97	NA	1.00	0.46	NA	N	A
4	12.5	13.5	13.0	SM	30				41	CA	120	1560	1560	1.1	1.40	1.15	0.85	1.0	35.5	4.7	1.15	45.7	1560	0.97	NA	1.00	0.46	NA	N	A
5	13.5	14.5	14.0	SM	30				57	SPT	120	1680	1680	1.1	1.40	1.15	0.85	1.2	102.9	4.7	1.15	123.4	1680	0.97	NA	1.00	0.46	NA	N	A
5	14.5	15.5	15.0	SM	30				57	SPT	120	1800	1800	1.1	1.40	1.15	0.85	1.2	100.0	4.7	1.15	120.1	1800	0.97	NA	1.00	0.46	NA	N	A
5	15.5	16.5	16.0	SM	30				57	SPT	120	1920	1920	1.0	1.40	1.15	0.90	1.2	103.0	4.7	1.15	123.6	1920	0.96	NA	1.00	0.46	NA	N	A
5	16.5	17.5	17.0	SM	30				57	SPT	120	2040	2040	1.0	1.40	1.15	0.90	1.2	100.3	4.7	1.15	120.5	2040	0.96	NA	1.01	0.44	NA	N	A
5	17.5	18.5	18.0	SM	30				57	SPT	120	2160	2160	1.0	1.40	1.15	0.90	1.2	97.7	4.7	1.15	117.5	2160	0.96	NA	1.00	0.44	NA	N	A
6	18.5	19.5	19.0	SM	30				39	SPT	120	2280	2280	1.0	1.40	1.15	0.90	1.2	65.2	4.7	1.15	79.9	2280	0.96	NA	0.99	0.44	NA	N	A
6	19.5	20.5	20.0	SM	30				39	SPT	120	2400	2400	0.9	1.40	1.15	0.90	1.2	63.6	4.7	1.15	78.1	2400	0.95	NA	0.98	0.44	NA	N	A
6	20.5	21.5	21.0	SM	30				39	SPT	120	2520	2520	0.9	1.40	1.15	0.90	1.2	62.1	4.7	1.15	76.3	2520	0.95	NA	0.97	0.44	NA	N	A
6	21.5	22.5	22.0	SM	30				39	SPT	120	2640	2640	0.9	1.40	1.15	0.90	1.2	60.6	4.7	1.15	74.7	2640	0.95	NA	0.97	0.44	NA	N	A
6	22.5	23.5	23.0	SM	30				39	SPT	120	2760	2760	0.9	1.40	1.15	0.95	1.2	62.5	4.7	1.15	76.9	2760	0.95	NA	0.96	0.44	NA	N	A
7	23.5	24.5	24.0	SM	30				64	SPT	120	2880	2880	0.9	1.40	1.15	0.95	1.2	100.3	4.7	1.15	120.5	2880	0.94	NA	0.95	0.44	NA	N	A
7	24.5	25.5	25.0	SM	30				64	SPT	120	3000	3000	0.8	1.40	1.15	0.95	1.2	98.1	4.7	1.15	118.0	3000	0.94	NA	0.94	0.44	NA	N	A
7	25.5	26.5	26.0	SM	30				64	SPT	120	3120	3120	0.8	1.40	1.15	0.95	1.2	96.0	4.7	1.15	115.6	3120	0.94	NA	0.93	0.44	NA	N	A
7	26.5	27.5	27.0	SM	30				64	SPT	120	3240	3240	0.8	1.40	1.15	0.95	1.2	94.0	4.7	1.15	113.3	3240	0.94	NA	0.93	0.44	NA	N	A
7	27.5	28.5	28.0	SM	30				64	SPT	120	3360	3360	0.8	1.40	1.15	0.95	1.2	92.1	4.7	1.15	111.0	3360	0.94	NA	0.92	0.44	NA	N	A
8	28.5	29.5	29.0	SM	30				38	SPT	120	3480	3480	0.8	1.40	1.15	1.00	1.2	56.4	4.7	1.15	69.8	3480	0.93	NA	0.91	0.44	NA	N	A
8	29.5	30.5	30.0	SM	30				38	SPT	120	3600	3600	0.8	1.40	1.15	1.00	1.2	55.3	4.7	1.15	68.6	3600	0.93	NA	0.90	0.44	NA	N	A
8	30.5	31.5	31.0	SM	30				38	SPT	120	3720	3720	0.7	1.40	1.15	1.00	1.2	54.2	4.7	1.15	67.3	3658	0.92	NA	0.90	0.44	NA	N	C
8	31.5	32.5	32.0	SM	30				38	SPT	120	3840	3840	0.7	1.40	1.15	1.00	1.2	53.2	4.7	1.15	66.1	3715	0.91	NA	0.89	0.44	NA	N	C
8	32.5	33.5	33.0	SM	30				38	SPT	120	3960	3960	0.7	1.40	1.15	1.00	1.2	52.2	4.7	1.15	65.0	3773	0.91	NA	0.88	0.44	NA	N	C
9	33.5	34.5	34.0	ML	60				16	SPT	120	4080	4080	0.7	1.40	1.15	1.00	1.2	21.6	5.0	1.20	30.9	3830	0.90	NA	0.88	0.44	NA	N	C
9	34.5	35.5	35.0	ML	60				16	SPT	120	4200	4200	0.7	1.40	1.15	1.00	1.2	21.2	5.0	1.20	30.4	3888	0.89	NA	0.87	0.44	NA	N	C
9	35.5	36.5	36.0	ML	60				16	SPT	120	4320	4320	0.7	1.40	1.15	1.00	1.2	20.8	5.0	1.20	30.0	3946	0.88	0.47	0.87	0.46	1.18	Y	
9	36.5	37.5	37.0	ML	60				16	SPT	120	4440	4440	0.7	1.40	1.15	1.00	1.2	20.5	5.0	1.20	29.6	4003	0.87	0.44	0.86	0.46	1.10	Y	
9	37.5	38.5	38.0	ML	60				16	SPT	120	4560	4560	0.7	1.40	1.15	1.00	1.2	20.1	5.0	1.20	29.1	4061	0.87	0.42	0.85	0.46	1.04	Y	
10	38.5	39.5	39.0	SP	5				53	SPT	120	4680	4618	0.6	1.40	1.15	1.00	1.2	66.1	0.0	1.00	66.1	4118	0.86	NA	0.85	0.46	NA	N	C
10	39.5	40.5	40.0	SP	5				53	SPT	120	4800	4675	0.6	1.40	1.15	1.00	1.2	65.6	0.0	1.00	65.6	4176	0.85	NA	0.85	0.46	NA	N	C
10	40.5	41.5	41.0	SP	5				53	SPT	120	4920	4733	0.6	1.40	1.15	1.00	1.2	65.1	0.0	1.00	65.1	4234	0.84	NA	0.85	0.46	NA	N	C
10	41.5	42.5	42.0	SP	5				53	SPT	120	5040	4790	0.6	1.40	1.15	1.00	1.2	64.6	0.0	1.00	64.6	4291	0.83	NA	0.84	0.46	NA	N	C
10	42.5	43.5	43.0	SP	5				53	SPT	120	5160	4848	0.6	1.40	1.15	1.00	1.2	64.1	0.0	1.00	64.1	4349	0.83	NA	0.84	0.46	NA	N	C
11	43.5	44.5	44.0	SP	5				41	SPT	120	5280	4906	0.6	1.40	1.15	1.00	1.2	49.2	0.0	1.00	49.2	4406	0.82	NA	0.84	0.46	NA	N	C
11	44.5	45.5	45.0	SP	5				41	SPT	120	5400	4963	0.6	1.40	1.15	1.00	1.2	48.8	0.0	1.00	48.8	4464	0.81	NA	0.84	0.46	NA	N	C
11	45.5	46.5	46.0	SP	5				41	SPT	120	5520	5021	0.6	1.40	1.15	1.00	1.2	48.4	0.0	1.00	48.4	4522	0.80	NA	0.83	0.46	NA	N	C
11	46.5	47.5	47.0	SP	5				41	SPT	120	5640	5078	0.6	1.40	1.15	1.00	1.2	48.0	0.0	1.00	48.0	4579	0.79	NA	0.83	0.46	NA	N	C
11	47.5	48.5	48.0	SP	5				41	SPT	120	5760	5136	0.6	1.40	1.15	1.00	1.2	47.7	0.0	1.00	47.7	4637	0.79	NA	0.83	0.46	NA	N	C
12	48.5	49.5	49.0	SP	5				33	SPT	120	5880	5194	0.6	1.40	1.15	1.00	1.2	38.1	0.0	1.00	38.1	4694	0.78	NA	0.83	0.46	NA	N	C
12	49.5	50.5	50.0	SP	5				33	SPT	120	6000	5251	0.6	1.40	1.15	1.00	1.2	37.8	0.0	1.00	37.8	4752	0.77	NA	0.82	0.46	NA	N	C

TABLE C-3
LIQUEFACTION INDUCED SETTLEMENT
BORING B-1 (2%PE in 50 yrs; FS=1.3)

Client: Olson

J.N. 2949.00

Site: Huntington Beach

Notes:

(1) Effective ER=55% normalized standard penetration resistance for clean sands, $(N_1)_{60\text{-}cs}$*1.1 (Seed, 1994).

(2) Volumetric strain (Ishihara and Yoshimine, 1992) using $(N_1)_{55\text{-}cs}$.

(3) Volumetric strain (Tokimatsu and Seed, 1987) using $(N_1)_{60\text{-}cs}$.

									Total δ (in.)	0.10	0.47	0.29
Depth Interval (ft)		Soil layer thickness (ft)	Fines <#200 Sieve (%)	$(N_1)_{60\text{-}cs}$	$(N_1)_{55\text{-}cs}$ (1)	FS	IY Percent ε_v (2)	CSR*	TS Percent ε_v (3)	IY δ (in.)	TS δ (in.)	Ave δ (in.)
Top	Bottom											
0.00	1.00	1.00	30	87.1	95.8	NA	0.00	0.46	NA	NA	NA	0
1.00	2.00	1.00	30	87.1	95.8	NA	0.00	0.46	NA	NA	NA	0
2.00	3.00	1.00	30	84.0	92.4	NA	0.00	0.46	NA	NA	NA	0
3.00	3.50	0.50	30	81.6	89.7	NA	0.00	0.46	NA	NA	NA	0
3.50	4.50	1.00	30	58.8	64.7	NA	0.00	0.46	NA	NA	NA	0
4.50	5.50	1.00	30	56.7	62.4	NA	0.00	0.46	NA	NA	NA	0
5.50	6.50	1.00	30	27.0	29.7	NA	0.00	0.46	NA	NA	NA	0
6.50	7.50	1.00	30	27.6	30.4	NA	0.00	0.46	NA	NA	NA	0
7.50	8.50	1.00	30	26.8	29.5	NA	0.00	0.46	NA	NA	NA	0
8.50	9.50	1.00	30	51.2	56.4	NA	0.00	0.46	NA	NA	NA	0
9.50	10.50	1.00	30	49.7	54.7	NA	0.00	0.46	NA	NA	NA	0
10.50	11.50	1.00	30	48.3	53.1	NA	0.00	0.46	NA	NA	NA	0
11.50	12.50	1.00	30	47.0	51.7	NA	0.00	0.46	NA	NA	NA	0
12.50	13.50	1.00	30	45.7	50.3	NA	0.00	0.46	NA	NA	NA	0
13.50	14.50	1.00	30	123.4	135.8	NA	0.00	0.46	NA	NA	NA	0
14.50	15.50	1.00	30	120.1	132.1	NA	0.00	0.46	NA	NA	NA	0
15.50	16.50	1.00	30	123.6	136.0	NA	0.00	0.46	NA	NA	NA	0
16.50	17.50	1.00	30	120.5	132.5	NA	0.00	0.44	NA	NA	NA	0
17.50	18.50	1.00	30	117.5	129.2	NA	0.00	0.44	NA	NA	NA	0
18.50	19.50	1.00	30	79.9	87.9	NA	0.00	0.44	NA	NA	NA	0
19.50	20.50	1.00	30	78.1	85.9	NA	0.00	0.44	NA	NA	NA	0
20.50	21.50	1.00	30	76.3	84.0	NA	0.00	0.44	NA	NA	NA	0
21.50	22.50	1.00	30	74.7	82.1	NA	0.00	0.44	NA	NA	NA	0
22.50	23.50	1.00	30	76.9	84.6	NA	0.00	0.44	NA	NA	NA	0
23.50	24.50	1.00	30	120.5	132.6	NA	0.00	0.44	NA	NA	NA	0
24.50	25.50	1.00	30	118.0	129.8	NA	0.00	0.44	NA	NA	NA	0
25.50	26.50	1.00	30	115.6	127.1	NA	0.00	0.44	NA	NA	NA	0
26.50	27.50	1.00	30	113.3	124.6	NA	0.00	0.44	NA	NA	NA	0
27.50	28.50	1.00	30	111.0	122.1	NA	0.00	0.44	NA	NA	NA	0
28.50	29.50	1.00	30	69.8	76.8	NA	0.00	0.44	NA	NA	NA	0
29.50	30.50	1.00	30	68.6	75.4	NA	0.00	0.44	NA	NA	NA	0
30.50	31.50	1.00	30	67.3	74.1	NA	0.00	0.44	NA	NA	NA	0
31.50	32.50	1.00	30	66.1	72.7	NA	0.00	0.44	NA	NA	NA	0
32.50	33.50	1.00	30	65.0	71.5	NA	0.00	0.44	NA	NA	NA	0
33.50	34.50	1.00	60	30.9	34.0	NA	0.00	0.44	NA	NA	NA	0
34.50	35.50	1.00	60	30.4	33.5	NA	0.00	0.44	NA	NA	NA	0
35.50	36.50	1.00	60	30.0	33.0	1.2	0.22	0.46	1.30	0.03	0.16	0.09
36.50	37.50	1.00	60	29.6	32.5	1.1	0.27	0.46	1.31	0.03	0.16	0.10
37.50	38.50	1.00	60	29.1	32.1	1.0	0.37	0.46	1.32	0.04	0.16	0.10
38.50	39.50	1.00	5	66.1	72.7	NA	0.00	0.46	NA	NA	NA	0
39.50	40.50	1.00	5	65.6	72.2	NA	0.00	0.46	NA	NA	NA	0
40.50	41.50	1.00	5	65.1	71.6	NA	0.00	0.46	NA	NA	NA	0
41.50	42.50	1.00	5	64.6	71.0	NA	0.00	0.46	NA	NA	NA	0
42.50	43.50	1.00	5	64.1	70.5	NA	0.00	0.46	NA	NA	NA	0
43.50	44.50	1.00	5	49.2	54.1	NA	0.00	0.46	NA	NA	NA	0
44.50	45.50	1.00	5	48.8	53.7	NA	0.00	0.46	NA	NA	NA	0
45.50	46.50	1.00	5	48.4	53.3	NA	0.00	0.46	NA	NA	NA	0
46.50	47.50	1.00	5	48.0	52.8	NA	0.00	0.46	NA	NA	NA	0
47.50	48.50	1.00	5	47.7	52.4	NA	0.00	0.46	NA	NA	NA	0
48.50	49.50	1.00	5	38.1	41.9	NA	0.00	0.46	NA	NA	NA	0
49.50	50.50	1.00	5	37.8	41.6	NA	0.00	0.46	NA	NA	NA	0

TABLE C-4
ANALYSIS OF DRY SEISMIC SETTLEMENT POTENTIAL
BORING B-1 (2%PE in 50 yrs; FS=1.3)

Client: Olson
J.N. 2949.00
Site: Huntington Beach

GW Depth: 30 feet
EQ Magnitude 6.79
MSF 1.34

Total Seismic Settlement of Unsaturated Soil w/ FS=2.0 (in):	0.19
Subtotal Seismic Settlement of Unsaturated Soil (in)	0.10
Total Thickness of Unsaturated Soil (ft)	29.5

Layer Mid-Depth (ft.)	Soil Type	Eff. Stress σ'_{vo}(tsf)	Clean Sand $(N_1)_{60}$	CSR	(psf) τ_{avg} Avg. Shear Stress	(tsf) σ_m' Mean Bulk Stress	(tsf) G_{max} Max. Dyn.Shr. Mod.	γ_{eff} (G_{eff}/G_{max})	Eff. Cyclic Shr.Strain γ_{eff}	Eff. Cyclic Shr.Strain γ_{eff} (%)	Volume Strain (%)	EQ Mag. Factor	Layer Thickness (ft.)	Estimated Dry Sand Seismic Settlement (in.)
									Fig.11		Fig.13			
0.5	SM	0.03	87.1	0.46	27.6	0.02	272.7	5.06E-05	7.20E-05	7.20E-03	2.19E-03	1.34	1.0	0.000
1.5	SM	0.09	87.1	0.46	82.8	0.06	472.3	8.76E-05	1.84E-04	1.84E-02	5.60E-03	1.34	1.0	0.001
2.5	SM	0.15	84.0	0.46	138.0	0.10	602.7	1.14E-04	3.08E-04	3.08E-02	9.35E-03	1.34	1.0	0.001
3.3	SM	0.20	81.6	0.46	179.4	0.13	680.5	1.32E-04	3.75E-04	3.75E-02	1.14E-02	1.34	0.5	0.001
4.0	SM	0.24	58.8	0.46	220.8	0.16	677.7	1.63E-04	5.57E-04	5.57E-02	1.69E-02	1.34	1.0	0.002
5.0	SM	0.30	56.7	0.46	276.0	0.20	748.6	1.84E-04	6.05E-04	6.05E-02	1.84E-02	1.34	1.0	0.002
6.0	SM	0.36	27.0	0.46	331.2	0.23	641.6	2.58E-04	1.67E-03	1.67E-01	1.09E-01	1.34	1.0	0.010
7.0	SM	0.42	27.6	0.46	386.4	0.27	698.4	2.77E-04	2.29E-03	2.29E-01	1.45E-01	1.34	1.0	0.013
8.0	SM	0.48	26.8	0.46	441.6	0.31	739.4	2.99E-04	3.37E-03	3.37E-01	2.22E-01	1.34	1.0	0.020
9.0	SM	0.54	51.2	0.46	496.8	0.35	971.2	2.56E-04	1.16E-03	1.16E-01	3.52E-02	1.34	1.0	0.003
10.0	SM	0.60	49.7	0.46	552.0	0.39	1013.7	2.72E-04	1.36E-03	1.36E-01	4.13E-02	1.34	1.0	0.004
11.0	SM	0.66	48.3	0.46	607.2	0.43	1053.1	2.88E-04	1.49E-03	1.49E-01	4.54E-02	1.34	1.0	0.004
12.0	SM	0.72	47.0	0.46	662.4	0.47	1089.9	3.04E-04	1.43E-03	1.43E-01	4.34E-02	1.34	1.0	0.004
13.0	SM	0.78	45.7	0.46	717.6	0.51	1124.4	3.19E-04	1.09E-03	1.09E-01	3.31E-02	1.34	1.0	0.003
14.0	SM	0.84	123.4	0.46	772.8	0.55	1619.2	2.39E-04	5.36E-04	5.36E-02	1.63E-02	1.34	1.0	0.001
15.0	SM	0.90	120.1	0.46	828.0	0.59	1661.0	2.49E-04	5.60E-04	5.60E-02	1.70E-02	1.34	1.0	0.002
16.0	SM	0.96	123.6	0.46	883.2	0.62	1731.7	2.55E-04	5.70E-04	5.70E-02	1.73E-02	1.34	1.0	0.002
17.0	SM	1.02	120.5	0.44	897.6	0.66	1770.0	2.54E-04	5.54E-04	5.54E-02	1.68E-02	1.34	1.0	0.002
18.0	SM	1.08	117.5	0.44	950.4	0.70	1806.3	2.63E-04	5.78E-04	5.78E-02	1.76E-02	1.34	1.0	0.002
19.0	SM	1.14	79.9	0.44	1003.2	0.74	1634.3	3.07E-04	7.91E-04	7.91E-02	2.41E-02	1.34	1.0	0.002
20.0	SM	1.20	78.1	0.44	1056.0	0.78	1663.9	3.17E-04	8.33E-04	8.33E-02	2.53E-02	1.34	1.0	0.002
21.0	SM	1.26	76.3	0.44	1108.8	0.82	1692.3	3.28E-04	8.71E-04	8.71E-02	2.65E-02	1.34	1.0	0.002
22.0	SM	1.32	74.7	0.44	1161.6	0.86	1719.5	3.38E-04	9.03E-04	9.03E-02	2.74E-02	1.34	1.0	0.002
23.0	SM	1.38	76.9	0.44	1214.4	0.90	1775.2	3.42E-04	8.84E-04	8.84E-02	2.69E-02	1.34	1.0	0.002
24.0	SM	1.44	120.5	0.44	1267.2	0.94	2103.3	3.01E-04	6.31E-04	6.31E-02	1.92E-02	1.34	1.0	0.002
25.0	SM	1.50	118.0	0.44	1320.0	0.98	2131.7	3.10E-04	6.35E-04	6.35E-02	1.93E-02	1.34	1.0	0.002
26.0	SM	1.56	115.6	0.44	1372.8	1.01	2159.1	3.18E-04	6.44E-04	6.44E-02	1.96E-02	1.34	1.0	0.002
27.0	SM	1.62	113.3	0.44	1425.6	1.05	2185.6	3.26E-04	6.70E-04	6.70E-02	2.04E-02	1.34	1.0	0.002
28.0	SM	1.68	111.0	0.44	1478.4	1.09	2211.2	3.34E-04	6.97E-04	6.97E-02	2.12E-02	1.34	1.0	0.002
29.0	SM	1.74	69.8	0.44	1531.2	1.13	1931.0	3.96E-04	1.03E-03	1.03E-01	3.14E-02	1.34	1.0	0.003

Attachment E

Notice of Transfer of Maintenance Responsibility

NOTICE OF TRANSFER OF RESPONSIBILITY

WATER QUALITY MANAGEMENT PLAN

8601 Western Avenue
Tentative Tract No. 19107

Submission of this Notice Of Transfer of Responsibility constitutes notice to the City of Buena Park that responsibility for the Water Quality Management Plan ("WQMP") for the subject property identified below, and implementation of that plan, is being transferred from the Previous Owner (and his/her agent) of the site (or a portion thereof) to the New Owner, as further described below.

I. Previous Owner/ Previous Responsible Party Information

Company/ Individual Name:		Contact Person:	
Street Address:		Title:	
City:	State:	ZIP:	Phone:

II. Information about Site Transferred

Name of Project (if applicable):	
Title of WQMP Applicable to site:	
Street Address of Site (if applicable):	
Planning Area (PA) and/ or Tract Number(s) for Site:	Lot Numbers (if Site is a portion of a tract):
Date WQMP Prepared (and revised if applicable):	

III. New Owner/ New Responsible Party Information

Company/ Individual Name:		Contact Person:	
Street Address:		Title:	
City:	State:	ZIP:	Phone:

IV. Ownership Transfer Information

General Description of Site Transferred to New Owner:	General Description of Portion of Project/ Parcel Subject to WQMP Retained by Owner (if any):
Lot/ Tract Numbers of Site Transferred to New Owner:	
Remaining Lot/ Tract Numbers Subject to WQMP Still Held by Owner (if any):	
Date of Ownership Transfer:	

Note: When the Previous Owner is transferring a Site that is a portion of a larger project/ parcel addressed by the WQMP, as opposed to the entire project/parcel addressed by the WQMP, the General Description of the Site transferred and the remainder of the project/ parcel no transferred shall be set forth as maps attached to this notice. These maps shall show those portions of a project/ parcel addressed by the WQMP that are transferred to the New Owner (the Transferred Site), those portions retained by the Previous Owner, and those portions previously transferred by Previous Owner. Those portions retained by Previous Owner shall be labeled as "Previously Transferred".

V. Purpose of Notice of Transfer

The purposes of this Notice of Transfer of Responsibility are: 1) to track transfer of responsibility for implementation and amendment of the WQMP when property to which the WQMP is transferred from the Previous Owner to the New Owner, and 2) to facilitate notification to a transferee of property subject to a WQMP that such New Order is now the Responsible Party of record for the WQMP for those portions of the site that it owns.

VI. Certifications

A. Previous Owner

I certify under penalty of law that I am no longer the owner of the Transferred Site as described in Section II above. I have provided the New Owner with a copy of the WQMP applicable to the Transferred Site that the New Owner is acquiring from the Previous Owner.

Printed Name of Previous Owner Representative:	Title:
Signature of Previous Owner Representative:	Date:

B. New Owner

I certify under penalty of law that I am the owner of the Transferred Site, as described in Section II above, that I have been provided a copy of the WQMP, and that I have informed myself and understand the New Owner's responsibilities related to the WQMP, its implementation, and Best Management Practices associated with it. I understand that by signing this notice, the New Owner is accepting all ongoing responsibilities for implementation and amendment of the WQMP for the Transferred Site, which the New Owner has acquired from the Previous Owner.

Printed Name of New Owner Representative:	Title:
Signature:	Date: