

APPENDIX J-4
Orcem Stormwater Control Plan

PRELIMINARY STORMWATER CONTROL PLAN
for
ORCEM CALIFORNIA

March 2016

Orcem California, Inc.
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TABLE OF CONTENTS

I. Project Data	1
II. Setting	1
II.A. Project Location and Description	1
II.B. Existing Site Features and Conditions	2
II.C. Opportunities and Constraints for Stormwater Control	2
III. Low Impact Development Design Strategies	3
III.A. Optimization of Site Layout	3
III.A.1. Limitation of development envelope	3
III.A.2. Preservation of natural drainage features	3
III.A.3. Setbacks from creeks, wetlands, and riparian habitats	3
III.A.4. Minimization of imperviousness	3
III.B. Use of Permeable Pavements	3
III.C. Dispersal of Runoff to Pervious Areas	3
III.D. Feasibility Assessment of Harvesting and Use for Treatment and Flow-Control	3
III.D.1. Permeability of Site Soils	3
III.D.2. Potential Opportunities for Harvesting and Use	3
IV. Documentation of Drainage Design	4
IV.A. Descriptions of each Drainage Management Area	4
IV.A.1. Table of Drainage Management Areas	4
IV.B. Tabulation and Sizing Calculations	4
IV.B.1. Information Summary for IMP Design	4
IV.B.2. Areas Draining to Non-LID Treatment	5
IV.B.3. Active Treatment System	5
V. Source Control Measures	6
V.A. Site activities and potential sources of pollutants	6
V.B. Source Control Table	6
VI. Stormwater Facility Maintenance	9
VI.A. Ownership and Responsibility for Maintenance in Perpetuity	9
VI.B. Summary of Maintenance Requirements for Each Stormwater Facility	9
VII. Construction Plan C.3 Checklist	9
VIII. Certifications	9

Attachments

Orcem Preliminary Plans

Active Treatment System Sketch

Industrial General Permit Testing Requirements

This Stormwater Control Plan was prepared using the template dated February 15, 2012.

I. PROJECT DATA

Table 1. Project Data

Project Name/Number	Orcem California
Application Submittal Date	March 2016
Project Location	800 Derr Ave, Vallejo, CA
Name of Developer	Orcem California, Inc
Project Phase No.	NA
Project Type and Description	Milling plant for the creation of GGBFS (ground granulated blast furnace slag)
Project Watershed	San Pablo Bay
Total Project Site Area (acres)	4.83
Total Area of Land Disturbed (acres)	4.83
Total New Impervious Surface Area (sq. ft.)	0
Total Replaced Impervious Surface Area	203,720
Total Pre-Project Impervious Surface Area	203,720
Total Post-Project Impervious Surface Area	203,720
50% Rule[*]	Applies
Project Density	78,000 sf / 203,720 sf (0.383 floor area ratio)
Applicable Special Project Categories	None
Percent LID and non LID treatment	8% LID treatment
HMP Compliance [†]	Option 1

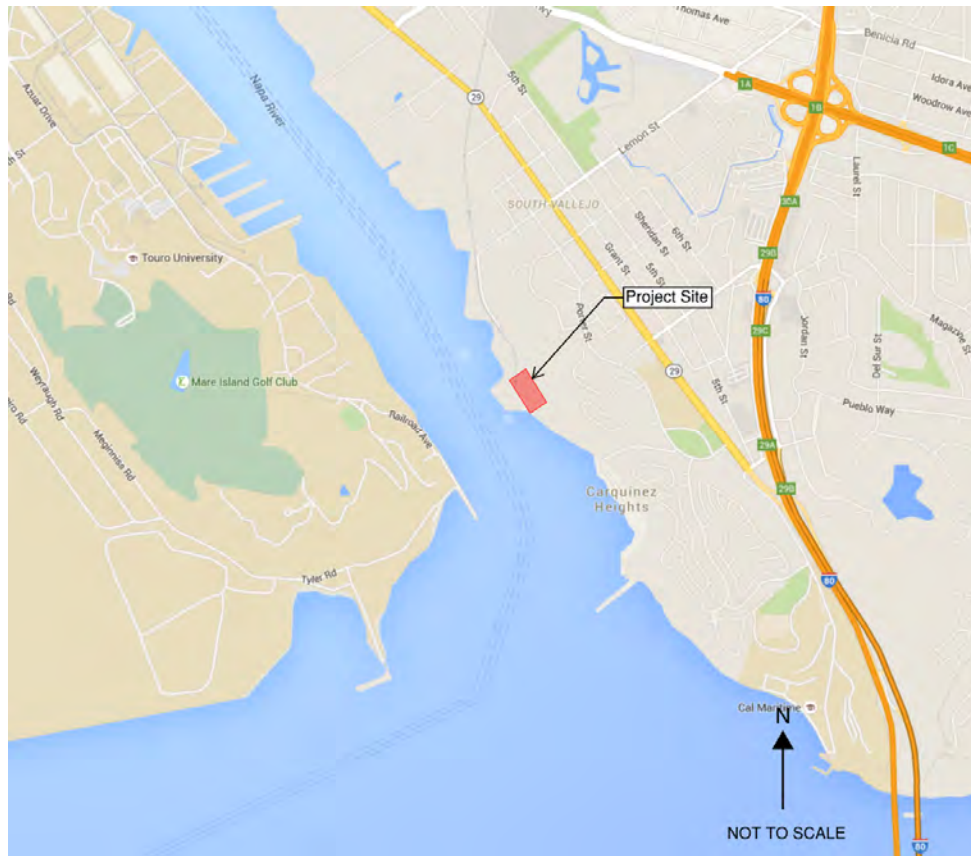
II. SETTING

II.A. Project Location and Description

The project site is located adjacent to Mare Island Strait in Vallejo, California, approximately 1.5 miles north of the I-80 Carquinez Bridge. See Vicinity Map below. The Orcem California property is leased from the Vallejo Marine Terminal (VMT).

The Orcem California site proposes the construction of a Ground Granulated Blast Furnace Slag (GGBFS) production facility. Granulated blast furnace slag is a byproduct of iron- and steel-making. The finished GGBFS is used in combination with, and as a substitute for, Portland cement to create a durable, low CO₂ concrete. Ships carrying slag will offload at VMT, and the slag will be stockpiled

at the Orcem site. When ready, these stockpiles will be moved to the mill to be ground in to GGBFS. The finished product will then be stored in silos until it transported by rail and truck for delivery.



II.B. Existing Site Features and Conditions

The existing Orcem project site consists of abandoned buildings related to a deep-water terminal and flour milling plant previously owned by General Mills, encompassing approximately 4.83-acres. The site is located at the southern tip of the Mare Island Strait, southwest of the City of Vallejo.

The project site generally slopes west at less than 5% towards Mare Island Strait, with elevations ranging from 16 feet to 10 feet above mean sea level (AMSL). Existing run-on from the hillside immediately east of the project drains stormwater from an approximate 6-acre area. Multiple drainage inlets are distributed throughout the site that capture stormwater and convey it in pipes to the Strait. Any stormwater that is not captured in the drainage inlets flow overland to Mare Island Strait.

II.C. Opportunities and Constraints for Stormwater Control

The Orcem project site is relatively flat, limiting the amount of grading that would be necessary to install stormwater control facilities. However, the nature of the product Orcem is producing limits the feasibility and effectiveness of LID stormwater control features. GGBFS is produced to be a cementitious material, hardening when it comes in to contact with water. LID stormwater control features that employ infiltration will become clogged with material that is carried in storm events and then hardens at the LID feature. Limiting the infiltration capability of the LID feature also limits its usefulness. For this reason, and for the purpose of meeting water quality requirements as laid out in the California Industrial General Permit, a structural BMP is proposed to be used.

III. LOW IMPACT DEVELOPMENT DESIGN STRATEGIES

III.A. Optimization of Site Layout

III.A.1. Limitation of development envelope

The development envelope is minimally reducing grading wherever possible.

III.A.2. Preservation of natural drainage features

The project preserves existing grade where possible.

III.A.3. Setbacks from creeks, wetlands, and riparian habitats

No creeks, wetland, or riparian habitats exist on-site.

III.A.4. Minimization of imperviousness

The existing site is completely developed. The site has no increase in impervious area.

III.B. Use of Permeable Pavements

Permeable pavements are not proposed for this site, as they would not interact well with the facility's proposed use. See Constraints for Stormwater Control in Section II.C.

III.C. Dispersal of Runoff to Pervious Areas

Pervious areas are limited, and treatment of runoff by more stringent means is necessary to meet requirements of the Industrial General Permit.

III.D. Feasibility Assessment of Harvesting and Use for Treatment and Flow-Control

III.D.1. Permeability of Site Soils

The groundwater elevation of the site is too high to allow infiltration facilities.

III.D.2. Potential Opportunities for Harvesting and Use

The Mill Building/Workshop is the only planned occupiable building, but is less than 10,000 SF. Rainwater harvesting for toilet and urinal water usage or irrigation is infeasible.

A portion of the treated stormwater runoff from the project is intended to be used as stockpile dust suppression. The project anticipates using a maximum of 2,400 gallons per day for stockpile watering. The project is proposing the use of an underground tank to provide a portion of the demand for the dust suppression system. Based on a 72 hour drawdown time for clearing the minimum storage volume, this harvesting and reuse will account for 8% of the project's stormwater treatment volume as determined by the Municipal Regional Permit.

IV. DOCUMENTATION OF DRAINAGE DESIGN

IV.A. Descriptions of each Drainage Management Area

IV.A.1. Table of Drainage Management Areas

<i>DMA Name</i>	<i>Surface Type</i>	<i>Area (square feet)</i>
R-1	Roof	9,060
R-2	Roof	2,720
R-3	Roof	1,300
R-4	Roof	18,000
R-5	Roof	18,000
S-1	Pavement	57,010
S-2	Pavement	9,760
S-3	Pavement	49,450
S-4	Pavement	38,420

Each drainage management area is directed west to the treatment area. Here stormwater is collected to be harvested and reused, or if the tank is full, it continues on to the Active Treatment System (ATS) described in Section IV.B.

IV.B. Tabulation and Sizing Calculations

IV.B.1. Information Summary for IMP Design

Total Project Area (Square Feet)	203,720
Mean Annual Precipitation (MAP)	17.5
IMPs Designed For:	Treatment only

Based on the project MAP and 100% disconnected impervious area, the design rainfall depth equals 0.74". The total volume of runoff is 12,590 cubic feet (94,173 gallons).

As discussed in section III.D.2, harvesting and reuse is capable of using 7,200 gallons of stormwater for the stockpile dust suppression system in a 72 hour period. This accounts for 8% of the Municipal Regional Permit volume-based treatment requirement. A stormwater capture tank will be provided for this purpose. Stormwater that is not captured for this use will continue on to the Active Treatment System described in Section IV.B.3.

IV.B.2. Areas Draining to Non-LID Treatment

<i>DMA Name</i>	<i>Area (square feet)</i>	<i>Non-LID Treatment System</i>
R-1	9,060	<i>Active Treatment System</i>
R-2	2,720	
R-3	1,300	
R-4	18,000	
R-5	18,000	
S-1	57,010	
S-2	9,760	
S-3	49,450	
S-4	38,420	

IV.B.3. Active Treatment System

An Active Treatment System (ATS) is designed to treat project site runoff to levels that meet the rigorous testing requirements of the Industrial General Permit (IGP). The ATS is designed as a treatment train, a series of treatments designed to provide the necessary level of treatment before discharging from the site. The treatment train consists of the following stages:

Oil-Water Separation

Oil and grease will likely drip from on-site trucks and equipment and deposit on the paved surfaces of the project site. An oil-water separator will remove gross amounts of the pollutants prior to discharging from the site.

pH Adjuster

As a cementitious material, GGBFS may alter the pH level of stormwater runoff. This pH level will need to be balanced prior to discharge. A sampling and injection device will be installed to adjust the pH level in the stormwater runoff. A pH controller samples the runoff and inject a balancing compound to adjust the pH to normal levels.

Underground Weir Tank

An underground weir tank acts as a pre-settlement chamber. The chamber prohibits the movement of stormwater through the tank until a designed capacity has been reached. This detention allows larger suspended solids to settle out of the stormwater before it moves on to the next stage.

Sand Filtration

In the next chamber, pumps will convey water through a sand filtration system. The filtration is stratified to eliminate the largest sediments first. Sand filtration will remove the smaller suspended solids (less than 10 microns) from the runoff.

Granulated Active Carbon Filter

Granulated Active Carbon (GAC) is the final treatment system. Effluent from the sand filter will again be pumped into the GAC filter. With the largest contaminants removed in the preceding treatments, the only remaining contaminants should be any dissolved compounds that were picked up in runoff. Any contaminants that reach this stage will be adsorbed by the granulated active carbon. The treated runoff will then be discharged from treatment train.

Final Sampling & Monitoring

A sampling and monitoring structure is required downstream of the active treatment system. The structure is responsible for testing runoff to ensure treatment has been effective in reaching the testing requirements of the Industrial General Permit (IGP). Failure of a test will result in a violation of the IGP. In the event that occurs, the Active Treatment System is highly customizable and will be modified to meet requirements.

V. SOURCE CONTROL MEASURES

V.A. Site activities and potential sources of pollutants

V.B. Source Control Table

<i>Potential source of runoff pollutants</i>	<i>Permanent source control BMPs</i>	<i>Operational source control BMPs</i>
A. On-site storm drain inlets	Mark all inlets with the words “No Dumping! Flows to Bay” with thermoplastic stenciling.	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. Annually remove sediment, trash, and debris from inlets prior to rainy season and as needed.
D1. Need for future indoor & structural pest control	Slope pavement away from buildings and compact backfill to prevent settling. Backfill should be free of organic material. Provide a membrane beneath the floor slab. Limit expansion joints. Mechanically vibrate floor slab to minimize voids. Maintain adequate clearance between wood structural components and soil.	Encourage the use of Integrated Pest Management techniques.

	Seal gaps between utility penetrations and slab.	
D2. Landscape/Outdoor Pesticide Use	<p>The final landscape plans will accomplish the following:</p> <ul style="list-style-type: none"> • Preserve existing vegetation to the maximum extent practicable. • Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. • Where landscaped areas are used to retain stormwater, specify plants that are tolerant of saturated soil conditions. • Consider using pest-resistant plants, especially adjacent to hardscape. • To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions. 	Maintain landscaping using minimum or no pesticides. Encourage the use of Integrated Pest Management techniques.
G. Refuse Areas	Site refuse will be stored at a covered trash area near the Workshop & Control Room Building. Adequate signage will be provided so staff can properly dispose of waste.	<p>Provide adequate number of receptacles.</p> <p>Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered.</p> <p>Prohibit/prevent dumping of liquid or hazardous wastes. Post “no hazardous materials” signs.</p> <p>Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site.</p>
H. Industrial Processes	Raw material will be stored outside. The raw material is similar to a coarse sand. The material will be transported in	All process activities to be performed indoors.

	<p>to the Mill Building where the process of grinding into to GGBFS will occur. The completed material will then be placed into silos for storage before being loaded onto trucks for transport.</p> <p>All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.</p>	
I. Outdoor Storage of Raw Materials	<p>Raw material will be stored outside. The raw material is similar to a coarse sand. The material stockpiles will be highly porous and are not likely to be transported with stormwater flows. In the event that they are, media filters are provided at each drain inlet throughout the site to capture material that is carried in stormwater runoff.</p>	<p>Maintain stockpiles daily. Ensure loose material is returned to the stockpiles and not left on surfaces to be tracked throughout the facility.</p>
M. Loading Docks	<p>The loading dock is located in the Outload Silos and Weighbridges building. The loading dock will be covered and transport trucks will drive through the structure to receive loads for delivery. The loading dock will not drain directly to an inlet.</p>	<p>Move loaded and unloaded items indoors as soon as possible.</p> <p>Keep spill control materials available on-site.</p> <p>Spot clean leaks and drips routinely to prevent runoff of spillage.</p>
P. Plazas, sidewalks, and parking lots.		<p>Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris.</p> <p>Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.</p>

VI. STORMWATER FACILITY MAINTENANCE

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

Orcem California, Inc commits to execute any necessary agreements and/or annex into a fee mechanism, per local requirements and accept responsibility for operation and maintenance of facilities until that responsibility is formally transferred.

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

- Inspect inlets and outlets. Clear any obstructions and remove any accumulation of sediment.
- Clean media filters after every rain event. Remove accumulated material and replenish filter material as necessary.
- Keep stockpiles well maintained. Limit loose stockpile material and prevent material from being tracked onto pavement.
- Sweep pavement surfaces regularly.

VII. CONSTRUCTION PLAN C.3 CHECKLIST

*Stormwater
Control
Plan
Page #*

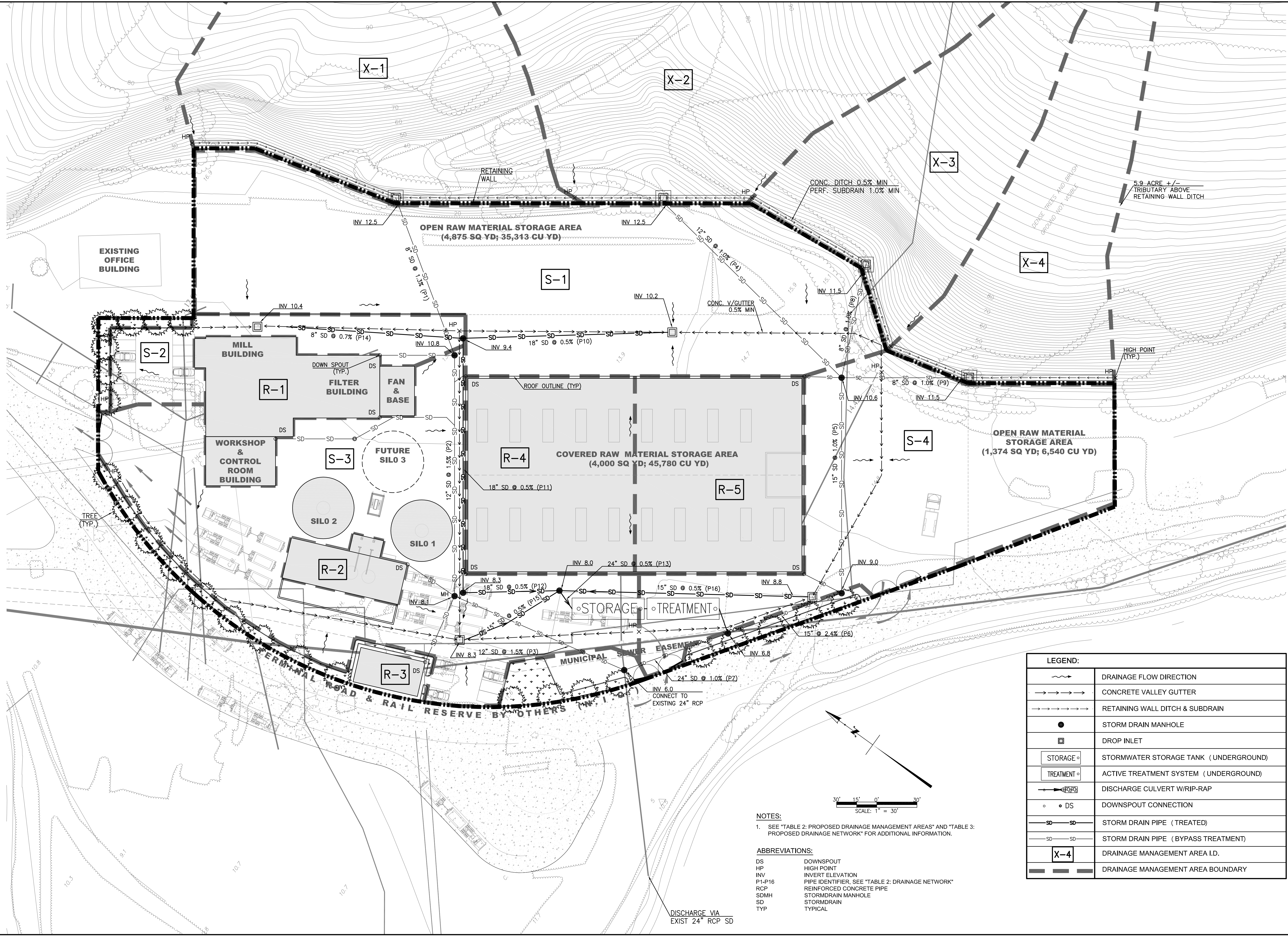
BMP Description

See Plan Sheet #s

5	Active Treatment System	5387-PP-104
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VIII. CERTIFICATIONS

The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R2-2009-0074 and Order R2-2011-0083.



Notes

Rev.	Date	By	Details Of Revision	Check

Project
PROPOSED PRODUCTION PLANT FACILITY

DRAINAGE PLAN

PROPERTY ADDRESS: VALLEJO MARINE TERMINAL 700 AND 700 SOUTH STREET VALLEJO CALIFORNIA 94588	PROPERTY OWNER: VALLEJO MARINE TERMINAL LLC 6171 CANTON ROAD LAQUETTE CALIFORNIA 94569 PHONE: 916.281.2600
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 Email: gdw@walshgoodfellow.com

PERMIT APPLICATION

Drawn	Scale			
Date	Emp.	Chk.	Appr.	

30' 15' 0' 30'
 SCALE: 1" = 30'

30' 15' 0' 30'
 SCALE: 1" = 30'

5387-PP-104

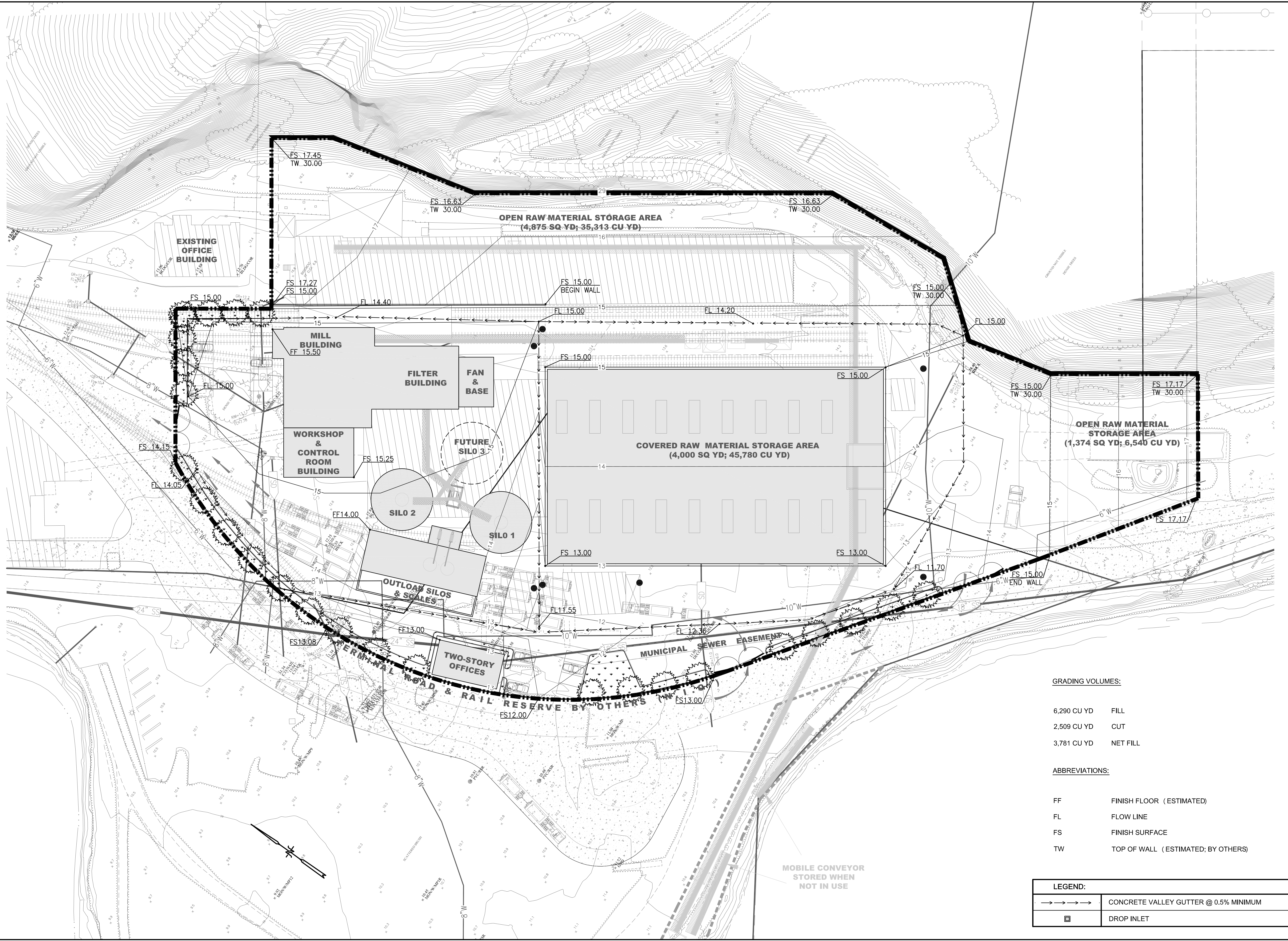
LEGEND:

	DRAINAGE FLOW DIRECTION
	CONCRETE VALLEY GUTTER
	RETAINING WALL DITCH & SUBDRAIN
	STORM DRAIN MANHOLE
	DROP INLET
	STORMWATER STORAGE TANK (UNDERGROUND)
	ACTIVE TREATMENT SYSTEM (UNDERGROUND)
	DISCHARGE CULVERT W/ RIP-RAP
	DOWNSPOUT CONNECTION
	STORM DRAIN PIPE (TREATED)
	STORM DRAIN PIPE (BYPASS TREATMENT)
	DRAINAGE MANAGEMENT AREA I.D.
	DRAINAGE MANAGEMENT AREA BOUNDARY

NOTES:
 1. SEE "TABLE 2: PROPOSED DRAINAGE MANAGEMENT AREAS" AND "TABLE 3: PROPOSED DRAINAGE NETWORK" FOR ADDITIONAL INFORMATION.

ABBREVIATIONS:
 DS DOWNSPOUT
 HP HIGH POINT
 INV INVERT ELEVATION
 P1-P16 PIPE IDENTIFIER, SEE "TABLE 2: DRAINAGE NETWORK"
 RCP REINFORCED CONCRETE PIPE
 SDMH STORMDRAIN MANHOLE
 SD STORMDRAIN
 TYP TYPICAL

DISCHARGE VIA EXIST 24" RCP SD



GRADING VOLUMES:

6,290 CU YD FILL
 2,509 CU YD CUT
 3,781 CU YD NET FILL

ABBREVIATIONS:

FF FINISH FLOOR (ESTIMATED)
 FL FLOW LINE
 FS FINISH SURFACE
 TW TOP OF WALL (ESTIMATED; BY OTHERS)

LEGEND:	
	CONCRETE VALLEY GUTTER @ 0.5% MINIMUM
	DROP INLET

Notes

Rev.	Date	By	Details Of Revision	Check

Project
PROPOSED PRODUCTION PLANT FACILITY

Grading Plan

PROPERTY ADDRESS: VALLEJO MARINE TERMINAL 700 AND 750 GIBSON STREET VALLEJO, CALIFORNIA 94592	PROPERTY OWNER: VALLEJO MARINE TERMINAL LLC 4175 GIBSON ROAD LAQUETTE, CALIFORNIA 94549 PHONE: 916.281.2600
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Notes

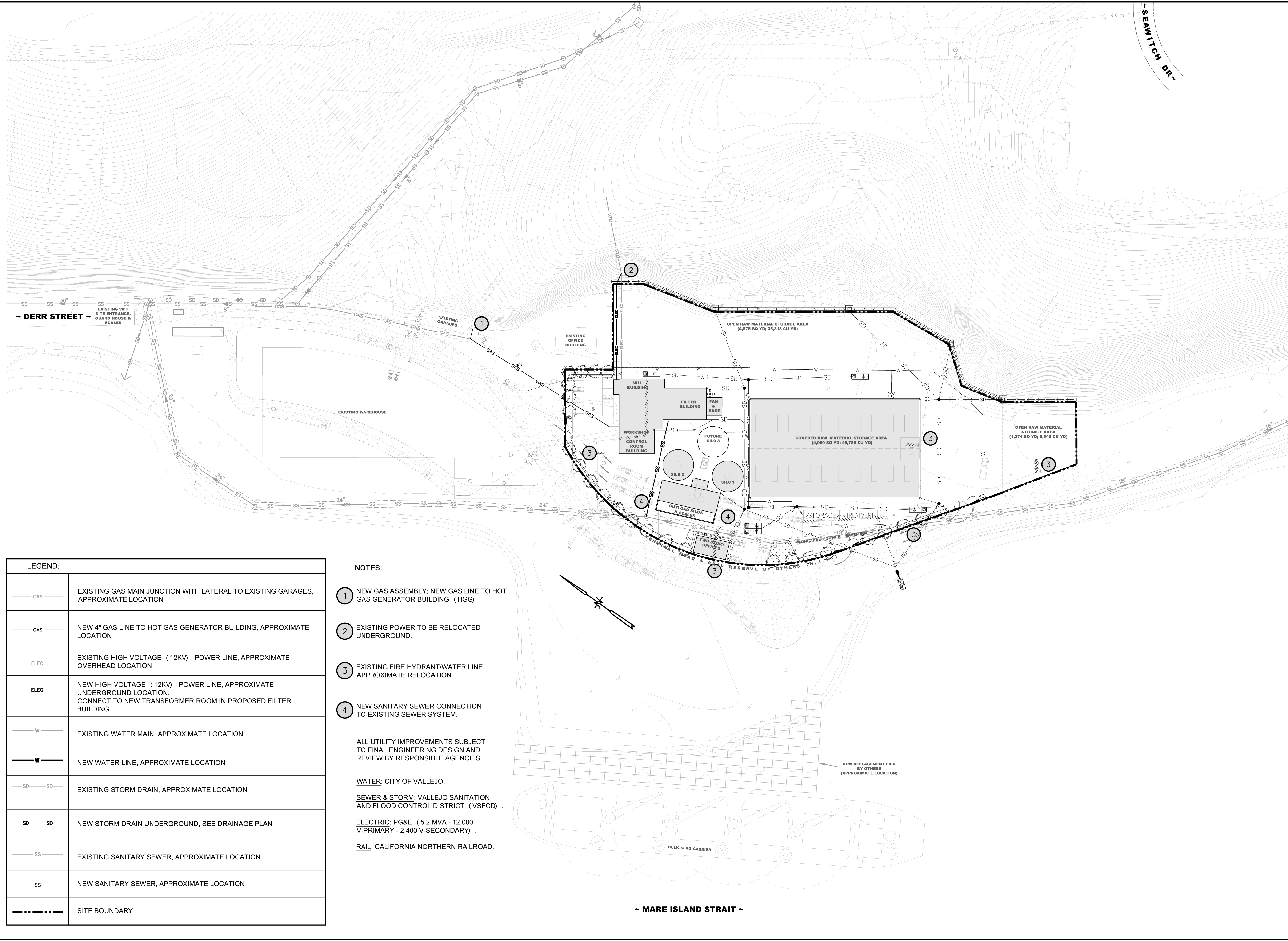
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Date	Emp.

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SCALE: 1" = 30'

Grading No. **5387-PP-105**



LEGEND:	
	EXISTING GAS MAIN JUNCTION WITH LATERAL TO EXISTING GARAGES, APPROXIMATE LOCATION
	NEW 4" GAS LINE TO HOT GAS GENERATOR BUILDING, APPROXIMATE LOCATION
	EXISTING HIGH VOLTAGE (12KV) POWER LINE, APPROXIMATE OVERHEAD LOCATION
	NEW HIGH VOLTAGE (12KV) POWER LINE, APPROXIMATE UNDERGROUND LOCATION. CONNECT TO NEW TRANSFORMER ROOM IN PROPOSED FILTER BUILDING
	EXISTING WATER MAIN, APPROXIMATE LOCATION
	NEW WATER LINE, APPROXIMATE LOCATION
	EXISTING STORM DRAIN, APPROXIMATE LOCATION
	NEW STORM DRAIN UNDERGROUND, SEE DRAINAGE PLAN
	EXISTING SANITARY SEWER, APPROXIMATE LOCATION
	NEW SANITARY SEWER, APPROXIMATE LOCATION
	SITE BOUNDARY

- NOTES:**
- 1 NEW GAS ASSEMBLY; NEW GAS LINE TO HOT GAS GENERATOR BUILDING (HGG)
 - 2 EXISTING POWER TO BE RELOCATED UNDERGROUND.
 - 3 EXISTING FIRE HYDRANT/WATER LINE, APPROXIMATE RELOCATION.
 - 4 NEW SANITARY SEWER CONNECTION TO EXISTING SEWER SYSTEM.

ALL UTILITY IMPROVEMENTS SUBJECT TO FINAL ENGINEERING DESIGN AND REVIEW BY RESPONSIBLE AGENCIES.

WATER: CITY OF VALLEJO.

SEWER & STORM: VALLEJO SANITATION AND FLOOD CONTROL DISTRICT (VSFCD)

ELECTRIC: PG&E (5.2 MVA - 12,000 V-PRIMARY - 2,400 V-SECONDARY)

RAIL: CALIFORNIA NORTHERN RAILROAD.

Notes

Rev.	Date	By	Details Of Revision	Chk.	Appr.

Client: _____

Project: **PROPOSED PRODUCTION PLANT FACILITY**

UTILITY SITE PLAN

PROPERTY ADDRESS: VALLEJO MARINE TERMINAL 700 PAD 700 DERR STREET VALLEJO CALIFORNIA 94589	PROPERTY OWNER: VALLEJO MARINE TERMINAL LLC 1471 GARDEN ROAD LAURETTE CALIFORNIA 94589 PHONE: 915.281.2600
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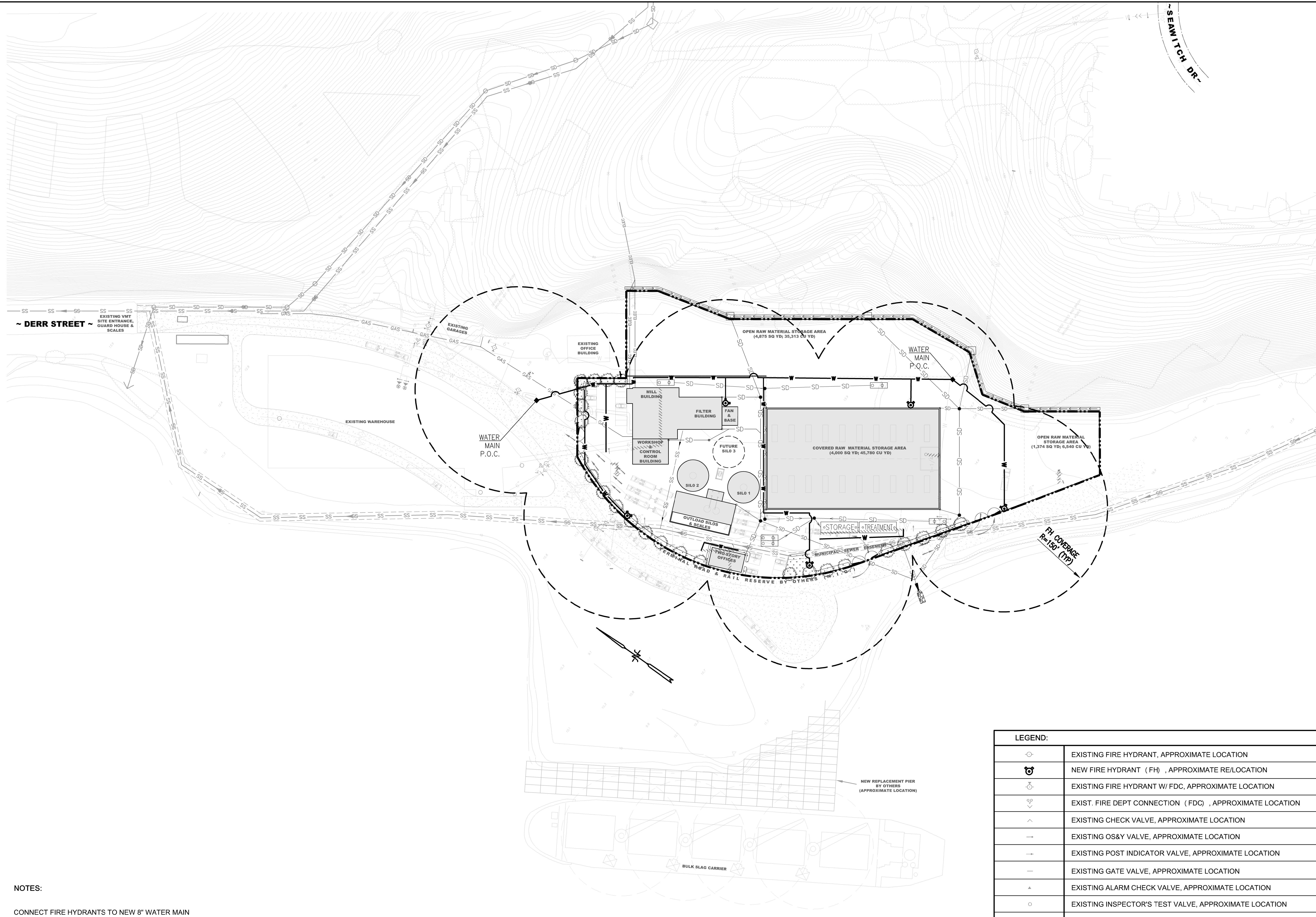
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60' 30' 0' 60'

SCALE: 1" = 60'

Drawing No. **5387-PP-106**



NOTES:
 CONNECT FIRE HYDRANTS TO NEW 8" WATER MAIN TO PROVIDE FULL SITE COVERAGE; APPROXIMATE LOCATION. FINAL PLANS SUBJECT TO FIRE DEPARTMENT APPROVAL.

LEGEND:	
	EXISTING FIRE HYDRANT, APPROXIMATE LOCATION
	NEW FIRE HYDRANT (FH), APPROXIMATE RE/LOCATION
	EXISTING FIRE HYDRANT W/ FDC, APPROXIMATE LOCATION
	EXIST. FIRE DEPT CONNECTION (FDC), APPROXIMATE LOCATION
	EXISTING CHECK VALVE, APPROXIMATE LOCATION
	EXISTING OS&Y VALVE, APPROXIMATE LOCATION
	EXISTING POST INDICATOR VALVE, APPROXIMATE LOCATION
	EXISTING GATE VALVE, APPROXIMATE LOCATION
	EXISTING ALARM CHECK VALVE, APPROXIMATE LOCATION
	EXISTING INSPECTOR'S TEST VALVE, APPROXIMATE LOCATION
	EXIST. AUTO SPRINKLER DISTRIBUTION PT, APPROX. LOCATION
P.O.C.	POINT OF CONNECTION (NEW TO EXISTING UTILITY)

Notes

Rev.	Date	By	Details Of Revision	Chk. Appr.

Client: _____

Project: **PROPOSED PRODUCTION PLANT FACILITY**

FIRE WATER PLAN & HYDRANT LOCATIONS

PROPERTY ADDRESS: VALLEJO MARINE TERMINAL 700 POND TOWER STREET VALLEJO, CALIFORNIA 94589
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PERMIT APPLICATION

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Drawing No: **5387-PP-107**

Active Treatment System Sketch

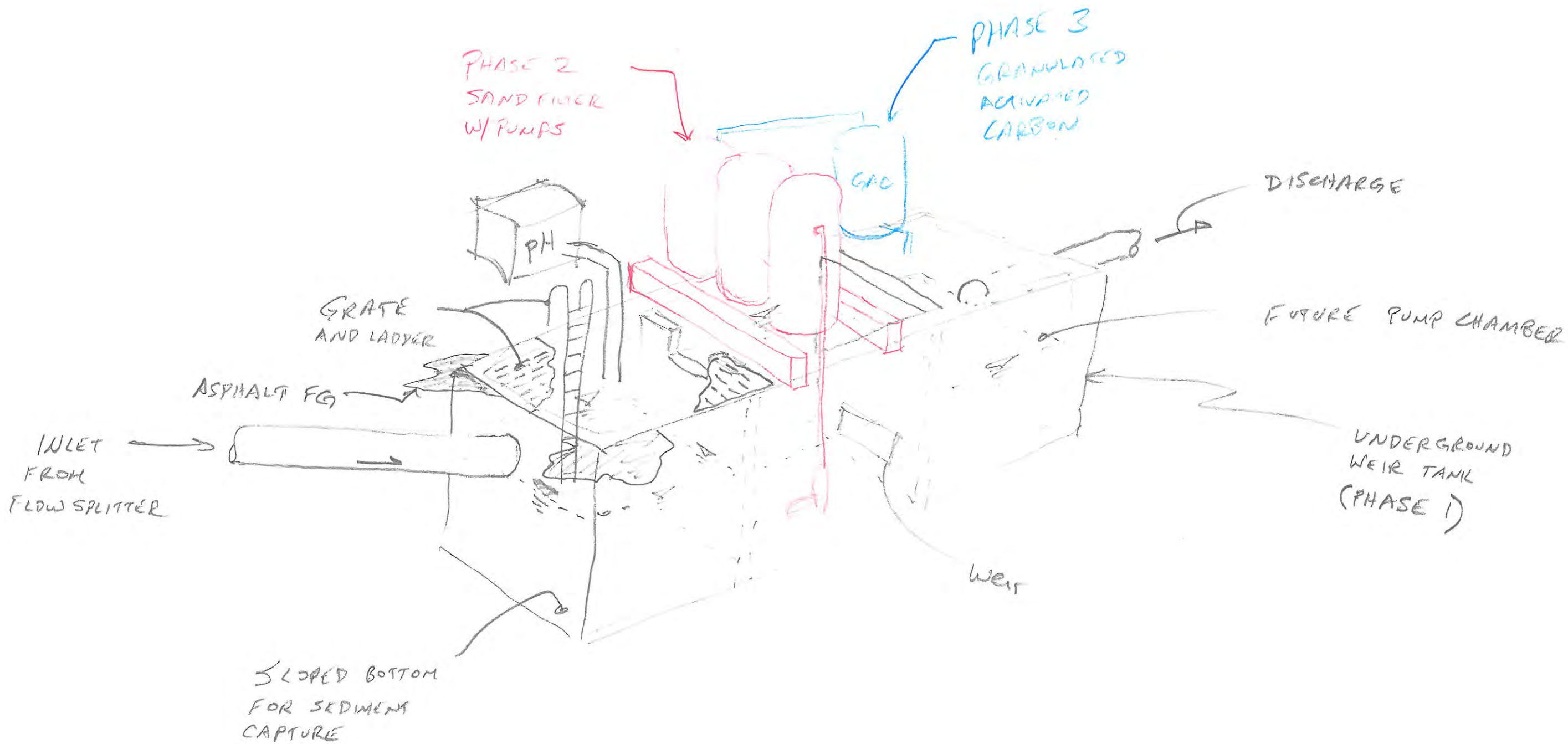


TABLE 2: Parameter NAL Values, Test Methods, and Reporting Units

PARAMETER	TEST METHOD	REPORTING UNITS	ANNUAL NAL	INSTANTANEOUS MAXIMUM NAL
pH*	See Section XI.C.2	pH units	N/A	Less than 6.0 Greater than 9.0
Suspended Solids (TSS)*, Total	SM 2540-D	mg/L	100	400
Oil & Grease (O&G)*, Total	EPA 1664A	mg/L	15	25
Zinc, Total (H)	EPA 200.8	mg/L	0.26**	
Copper, Total (H)	EPA 200.8	mg/L	0.0332**	
Cyanide, Total	SM 4500–CN C, D, or E	mg/L	0.022	
Lead, Total (H)	EPA 200.8	mg/L	0.262**	
Chemical Oxygen Demand (COD)	SM 5220C	mg/L	120	
Aluminum, Total	EPA 200.8	mg/L	0.75	
Iron, Total	EPA 200.7	mg/L	1.0	
Nitrate + Nitrite Nitrogen	SM 4500-NO3- E	mg/L as N	0.68	
Total Phosphorus	SM 4500-P B+E	mg/L as P	2.0	
Ammonia (as N)	SM 4500-NH3 B+ C or E	mg/L	2.14	
Magnesium, total	EPA 200.7	mg/L	0.064	
Arsenic, Total (c)	EPA 200.8	mg/L	0.15	
Cadmium, Total (H)	EPA 200.8	mg/L	0.0053**	
Nickel, Total (H)	EPA 200.8	mg/l	1.02**	
Mercury, Total	EPA 245.1	mg/L	0.0014	
Selenium, Total	EPA 200.8	mg/L	0.005	
Silver, Total (H)	EPA 200.8	mg/L	0.0183**	
Biochemical Oxygen Demand (BOD)	SM 5210B	mg/L	30	

SM – Standard Methods for the Examination of Water and Wastewater, 18th edition

EPA – U.S. EPA test methods

(H) – Hardness dependent

* Minimum parameters required by this General Permit

**The NAL is the highest value used by U.S. EPA based on their hardness table in the 2008 MSGP.