

July 6, 2018

Kirk Girard, Director
Department of Planning and Development
County of Santa Clara
70 W. Hedding Street, 7th Floor
San Jose, CA 95110

**Re: Permanente Quarry, Mine ID # 91-43-0004
Status Report on East Materials Storage Area**

Dear Mr. Girard:

The Planning Department has requested, in advance of the July 26, 2018 Planning Commission meeting, an update on the improvements being made to reduce discharges of storm water containing selenium from the East Materials Storage Area (“EMSA”), which is a part of Lehigh Southwest Cement Company’s (“Lehigh”) Permanente Quarry. This letter supplements our May 4, 2017 and November 8, 2017 reports on this issue.

Although Lehigh is in frequent contact with your staff, I would like to take this opportunity to provide an update to the Planning Department of our activities at the site. As you may know, Lehigh has undertaken a number of improvements at the Permanente facility in recent years.

We have invested in novel, state-of-the art water treatment to treat all process and comingled storm water flows at the facility. The treatment is effective, and is reducing pollutants to well under our National Pollutant Discharge Elimination System (NPDES) permit’s requirements, which are administered by the San Francisco Regional Water Quality Control Board (SFRWQCB).

The evolution of this treatment system began, as you know, in October 2014, when Lehigh began treating up to 400 gallons per minute (gpm) of quarry water with the Interim Treatment System (ITS), a pilot water treatment system to reduce Selenium and other compounds. Lehigh operated under this interim flow configuration until October 2017, when the Upper Final Treatment System (FTS) was commissioned. Under the final flow

configuration, the FTS treats all water discharged via permitted discharge point EFF-001, which includes flows from the Quarry and manufacturing plant (a.k.a. Reclaim Water System). The Lower FTS location is scheduled to be brought online in July 2018, this system will augment the treatment capacity.

Lehigh's water treatment systems are proving highly effective at reducing discharges of selenium and other metals. The below graph (Figure 1) shows progress made over the last four years. The ITS improved its efficiency over time as Lehigh made process improvements. Lehigh is pleased to report that the FTS performance has been effective and meets the NPDES requirements.

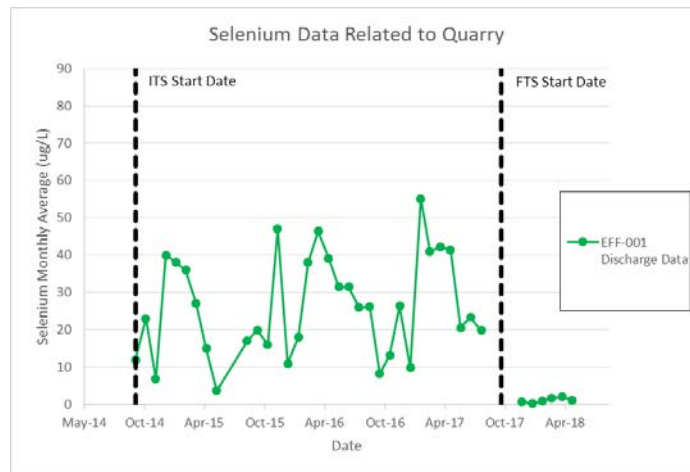


Figure 1. Selenium Data EFF-001

Figure 2 illustrates the decrease of selenium concentration in the receiving waters downstream from EFF-001 over the same period, demonstrating the effectiveness of the water treatment system.

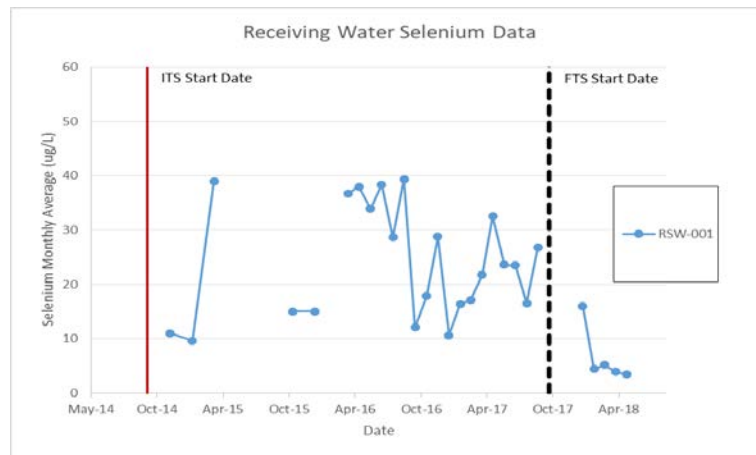


Figure 2. Selenium data receiving waters

In addition to treatment for process and comingled stormwater, Lehigh has taken significant steps to treat and control other stormwater flows at the facility, including significant infrastructure improvements to the Pond 20 and Pond 17 discharge points. At Pond 20, these improvements included diverting flow to the Reclaim Water System (which receives treatment via the FTS), lining the drainage swale to handle remaining flows, and enhancing the sediment basins and check dams. At Pond 17, the pond was reconfigured and lined.

This letter also updates the County on the improvements made to reduce discharges of storm water containing selenium from the East Materials Storage Area (“EMSA”). These flows previously discharged from Pond 30 to Permanente Creek, but are now diverted to the FTS. There have been no water discharges from Pond 30 since May 2017.

As background, Lehigh’s November 8, 2017 report proposed to eliminate storm water discharges from the EMSA by collecting Pond 30 discharges in a concrete vault and diverting those discharges to the FTS until final reclamation is achieved. The vault system has now been installed. Additionally, the existing drainage system to capture seepages and to prevent seep water from entering Pond 30 remains in place. The collected water from this drainage is also sent for treatment by the FTS. These interim solutions have proven effective at preventing discharges of selenium from the EMSA to Permanente Creek. A complete description of the collection and transfer system is contained in the attached plans and specifications of **Attachment 1**. Lehigh continues to analyze the existing reclamation cover design for the EMSA to determine whether modifications to that design are needed to achieve final reclamation.

Finally, in November 2017, the Planning Commission requested that Lehigh continue the surface water monitoring program in the 2017/2018 rainy season in a continuing effort to assess the water quality in the runoff prior to entering Pond 30. **Attachment 2** is a technical memorandum from Golder Associates with the results of those tests and a summary of all activities required by the Planning Commission for the EMSA. The sampling and analysis confirms the trend of low concentrations of selenium in the sediments lining Pond 30 and the adjacent swale, and reiterates its previous conclusion that accumulated sediments are probably not a primary factor causing elevated selenium in Pond 30.

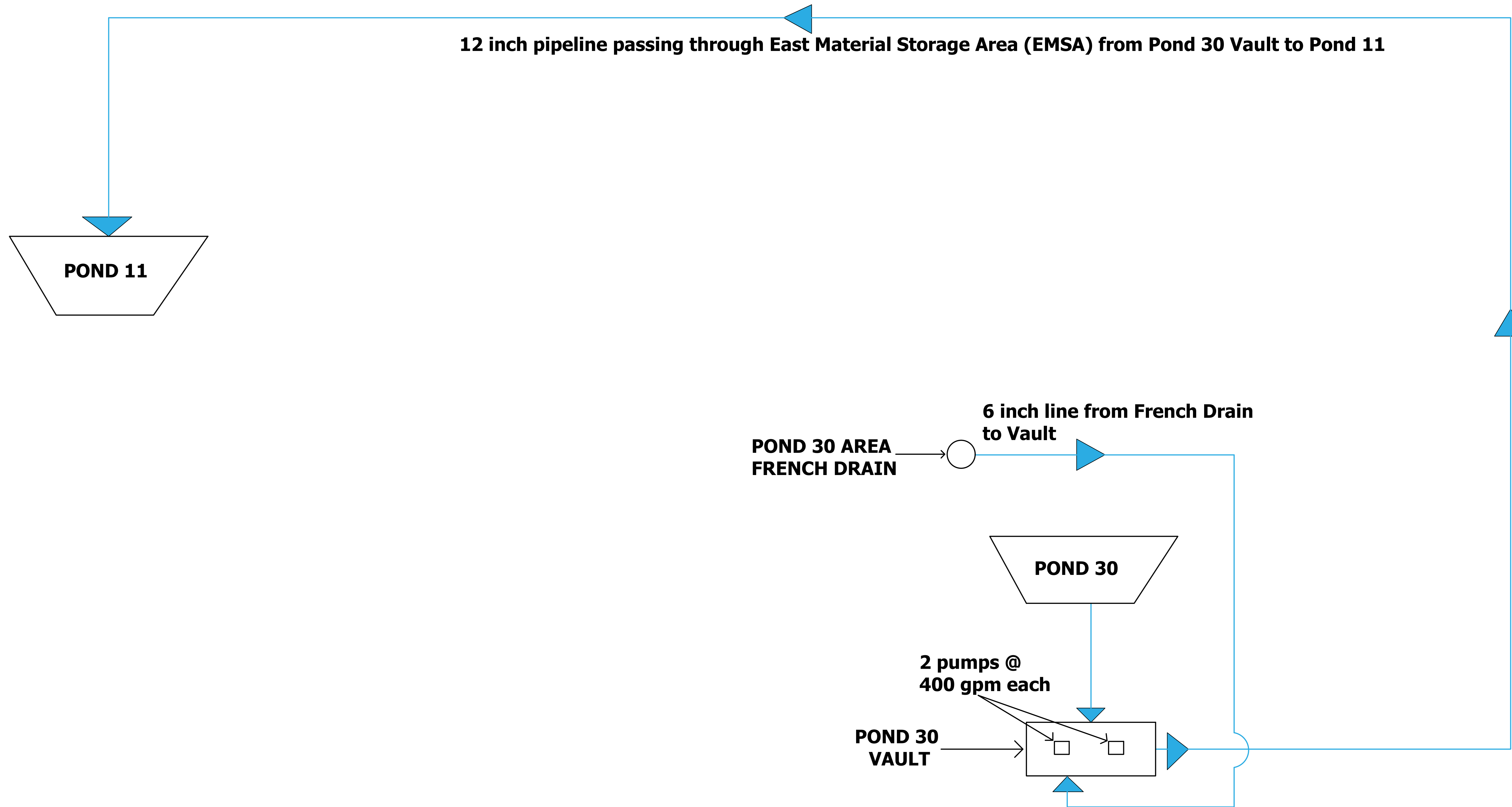
Lehigh appreciates the opportunity to provide this update and to provide any further information that may be requested. Please do not hesitate to contact me at 408-257-7476 extension 106 if you have questions or comments.

Sincerely,

A handwritten signature in black ink that reads "Erika Guerra". The signature is written in a cursive, flowing style.

Erika Guerra
Environmental and Land Management Director
Lehigh Southwest Cement Company

STORMWATER TRANSFER FROM POND 30 TO POND 11



DRAWN	MANJU SHIV	06/21/18	LEHIGH SOUTHWEST CEMENT COMPANY		
CHECKED			TITLE		
QA			POND 30 VAULT TO POND 11		
MFG			SIZE	DWG NO	REV
APPROVED			D	P30-P11	001
			SCALE		SHEET 1 OF 1

TECHNICAL MEMORANDUM

DATE 6/26/2018 1655230-02

TO Erika Guerra, Environmental Director
Lehigh Southwest Cement Company

CC Nicole Granquist, Sean Hungerford

FROM George Wegmann, PG; Bill Fowler, PG, CEG **EMAIL** gwegmann@golder.com

RE: EMSA Storm Water Runoff Evaluation Update, Lehigh Permanente Facility, Santa Clara County, CA

1.0 INTRODUCTION

Golder Associates Inc. (Golder) has prepared this memorandum to summarize activities required by the Santa Clara County Planning Commission (Planning Commission) for the East Material Storage Area (EMSA) of Lehigh Southwest Cement Company's Permanente facility located at 24001 Stevens Creek Boulevard, Santa Clara County.

During the May 25, 2017 Planning Commission meeting, the Planning Commission directed Lehigh to implement 1(a) through 1(e) below by fall of 2017:

1. Direct Lehigh to complete measures 1(a) through 1(e) below to capture and convey stormwater to the Water Treatment Facility and to ensure compliance with the Reclamation Plan Conditions of Approval related to stormwater discharges from Pond 30:

(a) By August 1, 2017, sample the sediment that remains at the bottom of Pond 30 to determine the selenium concentration and evaluate to what degree the sediment is contributing to the elevated concentrations in the Pond 30 discharge water.

(b) By September 1, 2017, extend the existing French drain approximately 100 feet farther to the north. This is intended to capture additional seepage that is infiltrating into Pond 30 and contributing to elevated selenium levels.

(c) By September 1, 2017, install an additional 60 gpm pump to capture water collected in the extension of the French drain. Lehigh may install a second 5,000-gallon storage tank depending upon the recommendations of its consultants.

(d) By September 1, 2017, enhance the pipeline and pump system to transfer water from the French drain tank(s) to the cement plant reclaimed water system. This will eliminate the need for truck transportation of water between these locations.

(e) Expand of the surface water monitoring program in the 2017/2018 rainy season in a continuing effort to assess the water quality in the runoff prior to entering Pond 30.

2. Direct Lehigh to install the following measures within four months of CRLF clearance with a report back to the Planning Commission by July 2018:

(a) Removal of sediment currently residing in Pond 30.

(b) Installation of a geomembrane (or similar) liner within Pond 30 and the adjacent drainage swale to eliminate seepage

2.0 SUMMARY OF ACTIVITIES

The EMSA is an approximately 54-acre overburden storage area in the northeast portion of the facility. Storm water runoff within the EMSA is directed to a series of swales, ditches, berms and intermediate ponds before reporting to Pond 30, a detention basin located at the base of the EMSA. Overburden storage ceased in the EMSA in approximately 2014. In 2015, Lehigh installed a non-limestone layer of material over disturbed areas in the EMSA to evaluate cover effectiveness. During the 2015/2016 and 2016/2017 wet seasons, Lehigh performed enhanced investigations of EMSA stormwater-related water quality. Pond 30 discharged to Permanente Creek prior to the 2017/2018 wet season when changes were made to the system (discussed in more detail in Sections 2.2 and 2.3 below).

The following summarizes activities completed over the course of the year to satisfy the Planning Commission directives.

2.1 Directive 1a: Sediment Sampling

Sediment sampling was completed in May 2017 at the end of the 2016/2017 wet season. The results were summarized in a memorandum submitted to the Planning Commission on November 11, 2017.¹ A second round of sampling was completed in May 2018 after this recent wet season. Both sampling events were conducted under the direction of a California Professional Geologist. The 2018 sampling event targeted the same sampling locations as in 2017 along the swale that leads into Pond 30. No samples were collected of sediment directly within Pond 30 during 2018 because of safety concerns with standing water and thick vegetation. Instead, Golder collected a sample (SWALE-SD3) from the bottom of the swale at the point it enters Pond 30.

The sample locations from 2017 and 2018 are shown on Figure 1. At each location, Golder collected a surficial sample and then a deeper sample from one foot below ground surface (bgs). The deeper sample was collected to evaluate potential differences with depth. The samples were collected with a hand auger or shovel and plastic scoops and placed in laboratory provided 8-ounce jars. Samples were transported to a certified analytical laboratory in a chilled cooler under chain of custody documentation. The laboratory analyzed the samples for total selenium by EPA method 6020. Based on the total results, three samples in each year were analyzed for selenium via the Soluble Threshold Limit Concentration (STLC) CAM Extraction Test (WET) using deionized water to determine the solubility of selenium.

The results of the sampling events are summarized below and illustrated on Figure 1.

Table 1: Sediment Sampling Results

Sample Location	Sample Depth (ft)	Date	Total Selenium (mg/kg)	STLC Selenium (mg/L)
PD-30-SD1	0	5/19/2017	ND<0.11	
	1	5/19/2017	ND<0.11	
PD-30-SD2	0	5/19/2017	0.23	0.0011 J
	1	5/19/2017	0.87	0.00079 J

¹ Golder Associates. 2017. Technical Memo, EMSA Sediment Sampling, Lehigh Permanente Facility. Prepared for Erika Guerra. November 11, 2017.

Sample Location	Sample Depth (ft)	Date	Total Selenium (mg/kg)	STLC Selenium (mg/L)
PD-30-SD3	0	5/19/2017	ND<0.11	
	1	5/19/2017	0.50	
SWALE-SD1	0	5/19/2017	0.85	0.0019 J
	1	5/19/2017	0.29 J	
	0	5/25/2018	0.50	0.0012 J
	1	5/25/2018	0.36	0.00060 J
SWALE-SD2	0	5/19/2017	ND<0.11	
	1	5/19/2017	ND<0.11	
	0	5/25/2018	ND<0.11	
	1	5/25/2018	ND<0.11	
SWALE-SD3	0	5/25/2018	0.50	0.0043
	1	5/25/2018	ND<0.11	

Notes: J = estimated value below the laboratory reporting limit.

The total selenium concentrations ranged from non-detect to 0.87 milligram per kilogram (mg/kg). The results were consistent between 2017 and 2018. From within Pond 30, the higher concentrations were noted from sample location PD-30-SD2, which is from the bottom of the pond by the outlet pipe, and from the deeper samples collected at 1 ft bgs. Selenium was not detected at PD-30-1, which is located along the western portion of the pond by the drainage swale. For the drainage swale, selenium was detected up to 0.85 mg/kg in the upgradient sample location (SWALE-SD1) and not detected above the laboratory method detection limit from the middle swale sample (SWALE-SD2) from 2017 and 2018. The surficial sample from SWALE-SD1 had a greater selenium concentration than the sample from 1 ft bgs during both sampling events in 2017 and 2018. As a point of comparison, the San Francisco Bay Regional Water Quality Control Board Tier 1 Environmental Screening Level for selenium in soil is 390 mg/kg. The Tier 1 ESLs are considered to be conservative and are based on conservative default site conditions (e.g., residential use)

Even though the total results were very low, STLC analysis was conducted to determine the leachability of total selenium and if it is contributing to the water quality of the Pond 30 discharge. Three samples from each year with higher total selenium results that were also from different locations and depths were selected for STLC analysis. STLC selenium detections ranged from 0.00060 mg/L, an estimated value below the laboratory reporting limit, to 0.0043 mg/L (0.60 µg/L to 4.3 µg/L). The STLC results are below the 5 µg/L water quality objective and suggest that the sediment is not a primary source of selenium in the Pond 30 discharge. Additional sediment data should be collected once Pond 30 and the swale are lined to confirm these results.

2.2 Directive 1b: Extend French Drain

By September 1, 2017, Lehigh was to extend the existing French drain approximately 100 feet farther to the north. Instead of extending the French drain, Lehigh decided to make improvements beyond the scope of this directive in order to capture and treat the Pond 30 outflow water while preventing discharges to Permanente Creek from Pond 30.

Lehigh installed a vault between Pond 30 and Permanente Creek and tied the Pond 30 discharge pipe into it. Two 400 gpm pumps for a total of 800 gpm capacity were installed in the vault and a new 12-inch pipeline was run from the vault to Pond 11. The system capacity was based on previous flow data and results from GoldSim (a probabilistic simulation modeling software). The existing French drain was also plumbed into the vault. The downgradient portion of the Pond 30 pipeline after the vault was cut and then plugged to ensure no flow entered it. During this past wet season, Lehigh managed the water in the sump by extracting accumulated water from the

vault with water trucks and transporting to Pond 11 and the Reclaim Water System. The water was then treated by the Final Treatment System prior to discharging to Permanente Creek under the facility's NPDES permit.

2.3 Directives 1c and 1d: Install additional 60 gpm pump and Enhance the Pipeline and Pump System

As noted under Section 2.2, Lehigh decided to make enhancements to capture the Pond 30 flow. Lehigh installed two 400 gpm pumps and a new 12-inch pipeline from the vault to Pond 11. The enhanced system was designed to transfer up to 800 gpm of water to Pond 11 going forward (Note: electrical improvements to the system are in progress).

2.4 Directive 1e: Expand the Surface Water Monitoring Program in the 2017/2018 Rainy Season

Golder completed the wet season monitoring program to include sample locations from 2016 and 2017, and expanded it to include any new areas identified during the sampling events (Figure 1). The final growth-medium and vegetative layer that is the next stage in the reclamation process has not been placed to date and therefore, the samples are from the non-limestone interim cover material. Several of the previous locations were dry this year primarily related to the drier than usual wet season where a total of 10 inches of rain was recorded at the SCVWD Maryknoll Fields weather station (<http://alert.valleywater.org>).

2.4.1 Sampling Procedure

Under the direction of a California Professional Geologist, Golder personnel collected samples from 11 locations in March/April 2018 during three rain events. A total of three rounds of samples were collected. During the rain events, Golder inspected the EMSA for runoff and/or sheet flow to target these areas for sampling. Similar to previous years, rainfall appeared to readily infiltrate the EMSA material in locations where no significant runoff or sheet flow was observed by field staff during the storm events. Most of the samples were collected of water that accumulated on the cover material and to a lesser extent locations where water appeared to be emanating as seeps from the toe of the EMSA slopes. The seepage appeared to be lesser than what was noted in 2016 and 2017, which is likely attributable to the relatively lower amount of precipitation this past wet season. The type of sample is noted on Table 2.

Samples were collected in accordance with Golder's Standard Operating Procedures and transported to a certified analytical laboratory in a chilled cooler under chain of custody documentation. The samples were placed in laboratory supplied sample bottles preserved with nitric acid. The laboratory analyzed the samples for total selenium via EPA Method 200.8. Golder also measured pH and turbidity in the field.

2.4.2 Sampling Results

The results of the sampling events are included on Table 2 and illustrated on Figure 1. Selenium detected in samples of water that accumulated on the cover material ranged from an estimated value of 0.40 µg/L to 17 µg/L. The first round results were typically greater than the subsequent sampling events. Results from samples collected along the toe of the EMSA slopes (e.g., EC-16, EC-26) ranged from 2.7 µg/L to 4.0 µg/L. These samples are considered more representative of seeps emanating from the toe of the slopes than direct runoff of the cover material. Results for EC-16 in 2016 ranged from 45 µg/L to 98 µg/L; this location was dry in 2017.

The P-30 Swale East results, ranging from 3.7 µg/L to 9.2 µg/L, were less than the results from the previous wet seasons (2015/2016: 42 µg/L to 60 µg/L; 2016/2017: 8.0 µg/L to 27 µg/L). The other swale locations were not sampled this past wet season because of limited flow; however, the discharge point of the upper pond that feeds

into the Pond 30 swale was sampled on 3/1 and 3/16. Selenium was detected at 2.6 µg/L and 13 µg/L, respectively. There was no flow during the third sampling event at this location. As discussed above, Pond 30 did not discharge during the rainy season because of the improvements made by Lehigh. Therefore, there is no discharge data.

While the results show improvement from previous wet seasons, additional data should be collected to better characterize the occurrence of selenium in storm water runoff at the EMSA.

2.5 Directives 2a and 2b: Pond 30 Removal of Sediment and Liner Installation

The Planning Commission directed Lehigh to implement the directives below within four months of California Red Legged Frog (CRLF) clearance, and follow up with a report back to the Planning Commission by July 2018:

(a) Removal of sediment currently residing in Pond 30.

(b) Installation of a geomembrane (or similar) liner within Pond 30 and the adjacent drainage swale to eliminate seepage

Directives 2a and 2b have not been completed to date. During 2017 and 2018, Lehigh continued to explore options with the United States Fish and Wildlife Service regarding CRLF clearance.

TABLES

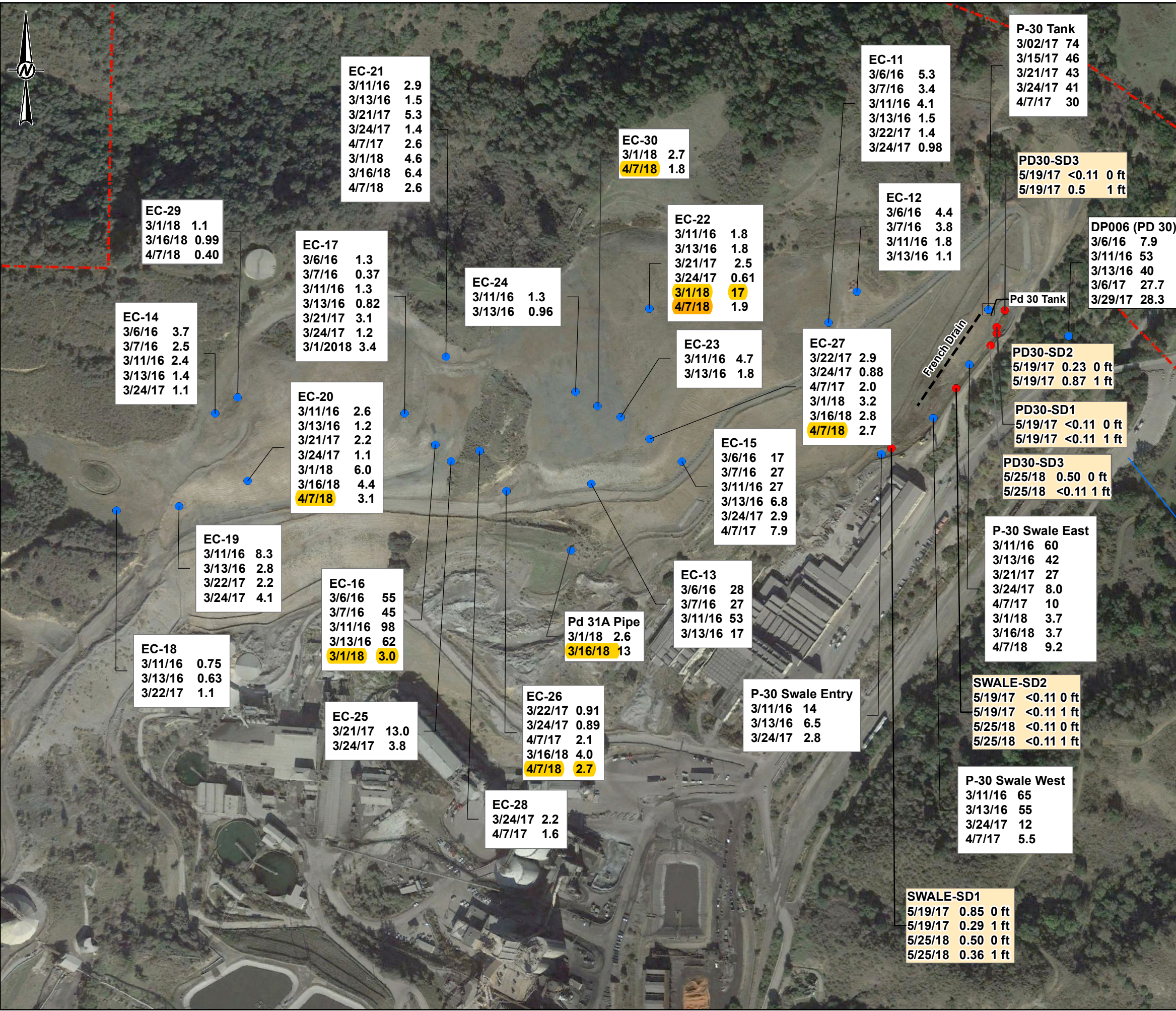
Table 2
2018 EMSA Selenium Results
June 2018

Sample Location	Date	Sample Type	Selenium ug/L	pH	Turbidity NTU	Notes
EC-16	3/01/2018	Seep	3.0	8.96	43.9	
EC-17	3/01/2018	Cover	3.4	9.20	1.61	
EC-20	3/01/2018	Cover	6.0	8.44	5.20	
EC-20	3/16/2018	Cover	4.4	8.86	1.84	
EC-20	4/07/2018	Cover	3.1	8.33	6.72	
EC-21	3/01/2018	Cover	4.6	8.70	1.71	
EC-21	3/16/2018	Cover	6.4	8.75	5.30	
EC-21	4/07/2018	Cover	2.6	8.40	0.52	
EC-22	3/01/2018	Cover	17	8.33	1.74	
EC-22	4/07/2018	Cover	1.9	8.33	1.82	
EC-26	3/16/2018	Cover	4.0	8.56	26.8	
EC-26	4/07/2018	Cover	2.7	7.81	14.7	
EC-27	3/01/2018	Seep	3.2	8.51	3.51	
EC-27	3/16/2018	Seep	2.8	8.37	61.7	
EC-27	4/07/2018	Seep	2.7	8.18	1.89	
EC-29	3/01/2018	Cover	1.1 J	8.28	30.4	toe of slope, ponded water
EC-29	3/16/2018	Cover	0.99 J	8.95	14.2	
EC-29	4/07/2018	Cover	0.40 J	8.85	21.3	
EC-30	3/01/2018	Cover	2.7	9.06	3.36	
EC-30	4/07/2018	Cover	1.8	8.65	8.04	
P-30 Swale East	3/01/2018	Seep/Runoff	3.7	8.18	8.04	
P-30 Swale East	3/16/2018	Seep/Runoff	3.7	8.04	2.59	
P-30 Swale East	4/07/2018	Seep/Runoff	9.2	7.49	2.67	
Pond 31A Outlet	3/01/2018	Seep/Runoff	2.6	8.04	5.14	
Pond 31A Outlet	3/16/2018	Seep/Runoff	13	7.85	1.98	

Notes:

J = estimated value below laboratory reporting limit

FIGURES



LEGEND

- **Water Sample**
Date Selenium (ug/L)
- **Sediment Sample**
Date Selenium (mg/kg) Depth (ft)
- Property Boundary



REFERENCE

1) USGS 1/9TH ARC NED DEM BASED OFF OF 2006 LIDAR SURVEY

PROJECT

LEHIGH PERMANENTE FACILITY
SANTA CLARA COUNTY, CA

TITLE

EMSA SELENIUM CONCENTRATIONS

CONSULTANT	YYYY-MM-DD	2018-06-27
	PREPARED	MR
	DESIGN	MR
	REVIEW	GW
	APPROVED	GW

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