Condition of Approval 38

Boulder Survey Report

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GEOCON

GEOCON PROJECT NO. S9325-06-09

AUGUST 2012

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GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. S9325-06-09
August 20, 2012

DRAFT VIA ELECTRONIC MAIL

Gregory Knapp
Lehigh Hanson
Director Environmental Region West
12667 Alcosta Blvd, Suite 400
San Ramon, CA 94583

Subject: PERMANENTE CREEK LIMESTONE BOULDER SURVEY REPORT
PERMANENTE QUARRY
CUPERTINO, SANTA CLARA COUNTY, CALIFORNIA

Dear Mr. Knapp:

We are pleased to provide this report of results for our Permanente Creek limestone boulder survey conducted at the Permanente Quarry in Cupertino, California. The project area consists of that portion of Permanente Creek adjacent to the quarry pit and the west materials storage area.

The accompanying report presents our findings, conclusions, and recommendations regarding the presence of limestone boulders in and immediately adjacent to Permanente Creek associated with mining on the Permanente Quarry site.

We appreciate the opportunity to be of service to you on this project. Please contact us should you have any questions concerning the contents of this report or if we may be of further service.

Sincerely,

GEOCON CONSULTANTS, INC.

PROFESSIONAL GEOLOGIST
8/31/12
DAVID W. BIEBER
No. 2092
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

David W. Bieber, PGP, CEG, CHG
Senior Geologist

Jim Brake, PG
Associate/Senior Geologist

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PERMANENTE CREEK LIMESTONE BOULDER SURVEY

1.0 INTRODUCTION

We are pleased to provide this report of results for our Permanente Creek limestone boulder survey at the Permanente Quarry in Cupertino, California (the Site). Lehigh Southwest Cement (Lehigh) prepared an Amended Reclamation Plan for the Permanente Quarry. During the amended reclamation plan approval process, Santa Clara County staff expressed concerns regarding water quality associated with limestone boulders in Permanente Creek. Santa Clara County staff is concerned that limestone boulders in the creek have the potential to leach selenium into surface waters. As a result, Lehigh is required to remove potential selenium-generating boulders attributable to mining activities on the Site from that portion of Permanente Creek adjacent to the west materials storage area (WMSA) and the quarry pit area as part of the reclamation process. Lehigh incorporated a best management practice (BMP) for limestone boulder removal into the Amended Reclamation Plan. The BMP identifies the requirements for the removal of limestone boulders from Permanente Creek. A copy of the boulder removal BMP is presented in Appendix A.

2.0 SITE DESCRIPTION

The Permanente Quarry is located at 24001 Stevens Creek Boulevard, adjacent to the western edge of Cupertino in Santa Clara County, California, as shown on the Vicinity Map, Figure 1. The survey area is that portion of Permanente Creek on the quarry property west of Pond 13B, which is adjacent to the east end of the quarry pit, to the west end of the west materials storage area (WMSA). The approximate limits of the survey area are shown on the Site Plans, Figures 2a through 2d.

3.0 PURPOSE

The purpose of this survey was to determine the approximate distribution of boulders attributable to mining activities in the survey area. The BMP requires the removal of limestone boulders from the Permanente Creek drainage in the survey area which meet the requirements below, as listed in the BMP:

- Have a surface composition of limestone, guided by visual identification and field testing;
- Located within the reclamation plan amendment boundary and upstream of the existing Pond 13;
- Located within the 100-year floodplain or on slopes immediately adjacent to the creek; and
- Presence in Permanente Creek is attributable to mining activities, rather than naturally occurring.

The term "boulder" refers to rocks greater than 10 inches in diameter. For the purposes of identifying boulders for removal, we defined boulders "immediately adjacent to the creek" as those that are within 10 feet of the 100-year floodplain. The determination that a boulder is attributable to mining activities was based on the boulder being located upstream of the known limestone outcrops on the Site and not exhibiting a shape or weathering pattern consistent with naturally occurring limestone boulders on the Site.

4.0 SCOPE OF SERVICES

To prepare this report, we performed the following scope of services:

- Performed a preliminary boulder removal evaluation on July 30, 2012, to observe the general distribution and characteristics of limestone boulders in the survey area.
- Prepared a *Preliminary Boulder Removal Evaluation Report* dated August 1, 2012, that contained the findings of our preliminary boulder removal evaluation and presented the procedures to be used to conduct the limestone boulder removal survey. A copy of our *Preliminary Boulder Removal Evaluation Report* is in Appendix B.
- Performed a field survey on August 2 and 3, 2012, to identify limestone boulders in the survey area that meet the removal requirements listed in the BMP, as listed in Section 3 of this report.
- Prepared this report summarizing our observations and recommendations regarding removal of limestone boulders attributable to mining activities.

5.0 SURVEY FIELD ACTIVITIES

We conducted our field survey to identify limestone boulders for removal on August 2 and 3, 2012, during the dry season (prior to October 15) and after approval of the reclamation plan amendment. The survey was conducted by David Bieber, a California Certified Engineering Geologist (CEG No. 2092) who is familiar with the geology and petrology of the Permanente Quarry and with the characteristics of naturally occurring versus mine-generated boulders. The field survey was conducted by walking Permanente Creek starting west of the WMSA at the location identified on the Site Plan, Figure 2a, and continuing eastward along the creek to approximately the area of Pond 13B.

5.1 Survey Procedure

Limestone boulders were identified visually and by field testing, as necessary to identify boulders of questionable composition. Field testing was performed by putting a few drops of diluted hydrochloric acid on suspect limestone boulders and observing whether there was a strong effervescence. Boulders that are identified as limestone by these means and had attributes consistent with those attributable to mining activities were marked with an identifying number using non-toxic fluorescent orange paint to allow subsequent identification by Permanente staff for removal.

5.2 Boulder Location

The locations of limestone boulders identified as attributable to mining activities during the field inspection were also mapped for reference using a global positioning system (GPS). GPS data was recorded as latitude and longitude using Map Datum NAD83/WGS84 in decimal degrees, and as Universal Transverse Mercator (UTM) coordinate system coordinates. Boulder locations will be converted by others to the datum used by Lehigh for the quarry. Where there were multiple boulders in contact with or close proximity to each other, the largest boulder in the cluster was numbered and the

remaining boulders in the cluster marked with an orange paint spot, and the number of individual boulder clasts making up the pile were noted to the extent practical. Data collected in the field during the survey included the GPS coordinates for each numbered boulder or cluster, and the approximate boulder size or number of and size range of boulders in a cluster, as applicable.

6.0 OBSERVATIONS AND CONCLUSIONS

We identified limestone outcrops that are within 50 feet of, or that Permanente Creek flows across, at three locations: two locations in the area adjacent to the WMSA, and in the area south-southwest of the quarry pit, as noted on the Site Plans. Rock types observed in other outcrops immediately adjacent to or that Permanente Creek flow across include volcanic rocks, metavolcanic rocks, and greywacke. Calcite veining and patchy calcite cementation were noted in each of the rock types observed in outcrops and in boulders.

In that portion of Permanente Creek extending from Pond 13B to approximately 3,500 feet west of Pond 13B, the creek flows across the main limestone body mined on the Site (primary limestone outcrop area). We understand that limestone mining pre-dating the Kaiser Permanente operations was conducted in the primary limestone outcrop area. As a result of the various mining activities and natural processes of rockfall and erosion in the primary limestone outcrop area, Permanente Creek is filled with a mixture of sediment, alluvium, colluvium, and rocky debris, an estimated 50 to 70 percent of which is limestone generally ranging from sand and silt-sized to boulders in excess of 8 feet in diameter. In many places, the rocky debris in the primary limestone outcrop area is several feet thick, and boulders attributable to mining activities cannot be readily distinguished from naturally occurring boulders. We estimate that the total volume of limestone boulders in and adjacent to the 100-year floodplain in the primary limestone outcrop area is approximately in the 8,000- to 13,000-cubic-yard range.

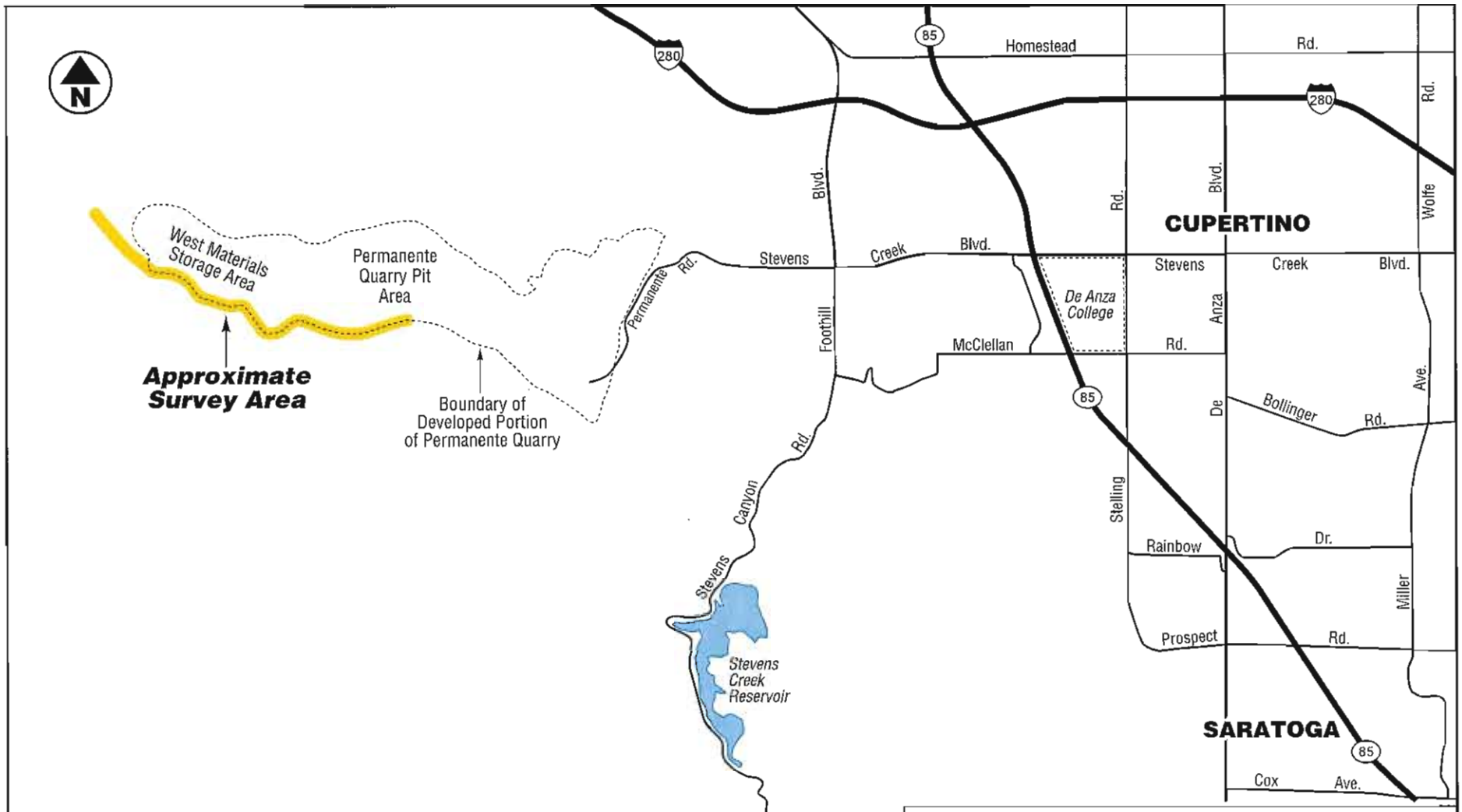
West of the primary limestone outcrop area, we identified 53 limestone boulders attributable to mining activities: 31 individual boulders, and 4 boulder clusters of 4, 3, 4, and 11 boulders respectively. The distribution of the boulders attributable to mining is illustrated on the Site Plans. Twenty of the boulders were in the creek bed, 17 were in the 100-year flood plain, and 14 were immediately adjacent to the 100-year flood plain.

The individual limestone boulders attributable to mining activities ranged in size from approximately 1 to 8 feet in diameter, with the average being approximately 4 feet. The 4-foot average size for the boulders attributable to mining activities is consistent with expectations, since those smaller than 4 feet do not generally have enough mass and thus momentum to carry them to the removal area when dumped. Boulders larger than 4 feet are rare because the mining methods used and the natural jointing and fracturing in the rock on the Site generally results in material with a maximum clast size of 6 to 8 feet in diameter. The locations and sizes of the limestone boulders identified as attributable to mining activities are listed in Table 1, Limestone Boulder Locations.

7.0 RECOMMENDATIONS

Based on our survey, the area of Permanente Creek subject to limestone boulder removal can be divided into two areas based on the general removal methods required; the primary limestone outcrop area and the balance of the survey area. Due to the volume of limestone boulder material in the primary limestone outcrop area, the most efficient method for removal of limestone boulders attributable to mining activities in that area would be mass excavation of the rocky material, without attempting to separate limestone attributable to mining activities from other materials. Following mass excavation, the creek bed and adjacent areas will require restoration. The mass excavation and streambed restoration would likely require permitting from the California Department of Fish and Game, and the U.S. Army Corps of Engineers.

Removal of limestone boulders in the balance of the survey area could be accomplished on an individual boulder basis. However, we recommend that the risk of leaching of selenium out of the boulders present in the balance of the survey area be weighed against the risks of degradation of Permanente Creek from the removal operation. Only about half of the boulders in the balance of the survey area are small enough to move manually or can readily be broken into pieces small enough to move manually using hand tools. Those boulders which are too large to move manually or be readily broken up using hand tools are not currently accessible by machine without the construction of a road along the creek bed. During our boulder survey, we observed fish in Permanente Creek which according to Goeff Smick, Principal Ecologist with WRA, Inc., are Steelhead, and road construction in the Permanente Creek drainage will likely require permitting from the California Department of Fish and Game, and the U.S. Army Corps of Engineers. We recommend that a field consultation be held between Lehigh's consultants, Santa Clara County staff, the California Department of Fish and Game, and the U.S. Army Corps of Engineers to discuss the feasibility of removing the boulders without impairing Permanente Creek in the balance of the survey area.



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Permanente Creek Boulder Survey

Lehigh Permanente Quarry
Cupertino, California

VICINITY MAP

S9325-06-09	August 2012	Figure 1

LEGEND:

- Approximate Limestone Boulder Location

0 120
Scale In Feet

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SITE PLAN

S9325-06-09	August 2012	Figure 2a

LEGEND:

Approximate Limestone Boulder Location

N

0 200
Scale in Feet

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Cupertino, California

SITE PLAN

S9325-06-09	August 2012	Figure 2b

LEGEND:

- Approximate Limestone Boulder Location
- Area where Permanente Creek flows across Limestone outcrop. (Due to historic mining and natural processes, the majority of the boulders in this area appear to be limestone which cover the creek bed at a depth of several feet)

N

0 150
Scale in Feet

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Cupertino, California

SITE PLAN

S9325-06-09	August 2012	Figure 2c

LEGEND:

Area where Permanente Creek flows across Limestone outcrop. (Due to historic mining and natural processes, the majority of the boulders in this area appear to be limestone which cover the creek bed at a depth of several feet)

N

0 200
Scale in Feet

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Permanente Creek Boulder Survey

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SITE PLAN

S9325-06-09	August 2012	Figure 2d

Photo No. 1 Boulder 1 adjacent to 100-year flood plain. View looking west.

Photo No. 2 Boulder Cluster 2, Boulder 3, Boulder Cluster 4, and Boulder 5 in Permanente Creek. View looking west.

PHOTOS NO. 1 & 2

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Lehigh Permanente Quarry Cupertino, California	
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Photo No. 3 Boulder 6 adjacent to 100-year flood plain. View looking west.

Photo No. 4 Boulder 7 in 100-year flood plain. View looking west.

PHOTOS NO. 3 & 4

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Permanente Creek Boulder Survey

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Photo No. 5 Boulder 8 in 100-year flood plain. View looking east.

Photo No. 6 Boulder 9, Boulder 10, and Boulder 11 in Permanente Creek. View looking east.

PHOTOS NO. 5 & 6

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Photo No. 7 Boulder 12 in Permanente Creek. View looking east.

Photo No. 8 Boulder 13 in Permanente Creek. View looking east.

PHOTOS NO. 7 & 8

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Photo No. 9 Boulder 14 in Permanente Creek. View looking east.

Photo No. 10 Boulder 15 in 100-year flood plain. View looking south.

PHOTOS NO. 9 & 10

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Permanente Creek Boulder Survey

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Photo No. 11 Boulder 16 adjacent to 100-year flood plain. View looking west.

Photo No. 12 Boulder 17 in 100-year flood plain. View looking southeast.

PHOTOS NO. 11 & 12

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Permanente Creek Boulder Survey

Lehigh Permanente Quarry
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Photo No. 13 Boulder 18 in Permanente Creek. View looking east.

Photo No. 14 Boulder 19 in 100-year flood plain. View looking west.

PHOTOS NO. 13 & 14

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Permanente Creek Boulder Survey	
Lehigh Permanente Quarry Cupertino, California	
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Photo No. 15 Boulder 20 in 100-year flood plain. View looking west.

Photo No. 16 Boulder 21 in 100-year flood plain. View looking west.

PHOTOS NO. 15 & 16

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Permanente Creek Boulder Survey

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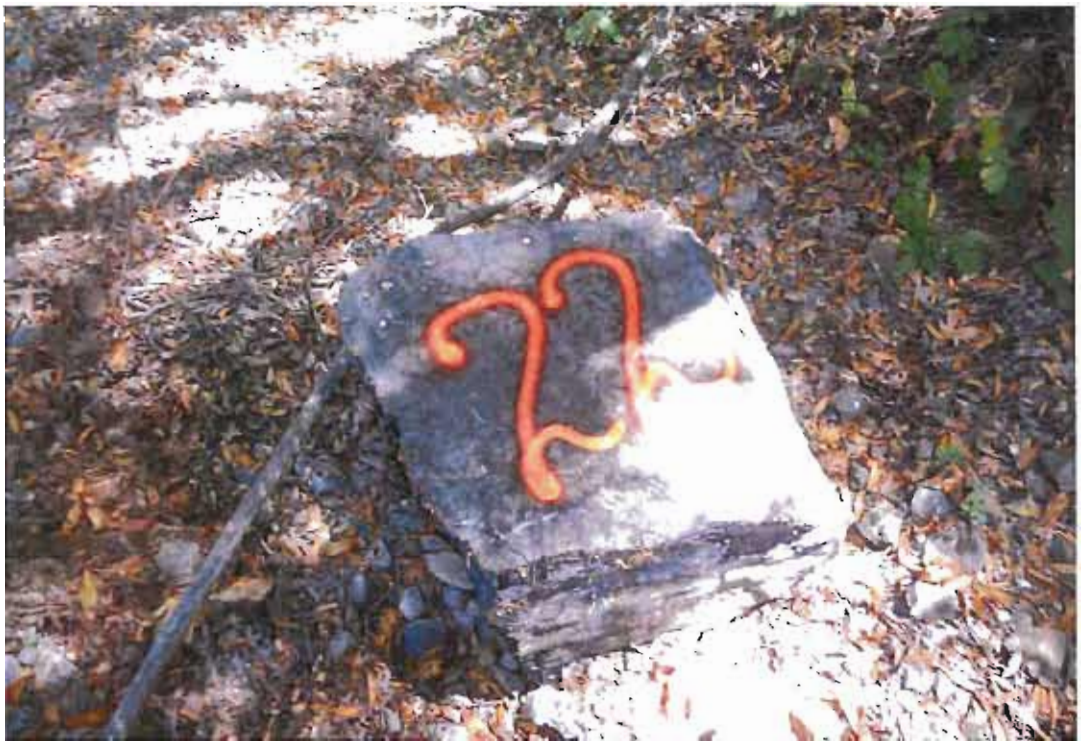

Photo No. 17 Boulder 22 in 100-year flood plain. View looking east.

Photo No. 18 Boulder 23 in 100-year flood plain. View looking southeast.

PHOTOS NO. 17 & 18

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Permanente Creek Boulder Survey	
Lehigh Permanente Quarry Cupertino, California	
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Photo No. 19 Boulder 24 in 100-year flood plain. View looking east.

Photo No. 20 Boulder Cluster 25 adjacent to 100-year flood plain. View looking south.

PHOTOS NO. 19 & 20

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Permanente Creek Boulder Survey

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Photo No. 21 Boulder 26 adjacent to 100-year flood plain. View looking south.

Photo No. 22 Boulder 27 in 100-year flood plain. View looking northeast.

PHOTOS NO. 21 & 22

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Permanente Creek Boulder Survey

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Photo No. 23 Boulder 28 in 100-year flood plain. View looking east.

Photo No. 24 Boulder 29 and Boulder 30 in Permanente Creek. View looking south.

PHOTOS NO. 23 & 24

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Photo No. 25 Boulder 31 in Permanente Creek. View looking south.

Photo No. 26 Boulder 32 in 100-year flood plain. View looking west

PHOTOS NO. 25 & 26

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Permanente Creek Boulder Survey	
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Photo No. 27 Boulder Cluster 33 in and adjacent to 100-year flood plain. View looking west.

Photo No. 28 Boulder Cluster 33 in and adjacent to 100-year flood plain. View looking east.

PHOTOS NO. 27 & 28

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Permanente Creek Boulder Survey

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Photo No. 29 Boulder 34 adjacent to 100-year flood plain. View looking south.

Photo No. 30 Boulder 35 adjacent to 100-year flood plain. View looking north.

PHOTOS NO. 29 & 30

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Permanente Creek Boulder Survey

Lehigh Permanente Quarry
Cupertino, California

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TABLE 1

SUMMARY OF LIMESTONE BOULDER LOCATIONS

PERMANENTE CREEK ADJACENT TO THE WEST MATERIALS STORAGE AREA AND PERMANENTE QUARRY PIT

LEHIGH PERMANENTE QUARRY

CUPERTINO, CALIFORNIA

Feature No.	Feature Type	Latitude	Longitude	UTM Coordinates (Zone 10)		Approximate diameter (feet)	Comments
				Easting	Northing		
N/A	West end of survey area	37.32533	-122.13661	576493	4131313	N/A	Bedrock in creek is volcanic breccia
N/A	Limestone outcrop	37.32299	-122.13470	576665	4131055	N/A	In sidehill on south side of creek
1	Boulder	37.32036	-122.13242	576870	4130765	3	In sidehill adjacent to the 100-year flood level made up of limestone and volcanic breccia.
2	Cluster of 4 boulders	37.32085	-122.13218	576890	4130819	8,6,6,4	In creek bed.
3	Boulder	37.32077	-122.13216	576892	4130811	1x2	In creek bed.
4	Cluster of 3 boulders	37.32079	-122.13213	576895	4130813	6, 2, 1.3	In creek bed.
5	Boulder	37.32073	-122.13215	576893	4130806	3.5	In creek bed.
N/A	Limestone outcrop	37.32042	-122.13151	576950	4130772	N/A	In creek bed.
6	Boulder	37.32001	-122.13014	577072	4130728	6	Adjacent to the 100-year flood level.
7	Boulder	37.32015	-122.12925	577151	4130744	7	In the 100-year flood level.
8	Boulder	37.32013	-122.12910	577164	4130742	3.5	In the 100-year flood level.
9	Boulder	37.31971	-122.12778	577281	4130697	4	In creek bed.
10	Boulder	37.31970	-122.12778	577281	4130695	5	In creek bed.
11	Boulder	37.31974	-122.12767	577291	4130700	4x6	In creek bed.
12	Boulder	37.31959	-122.12746	577310	4130683	1.5,6	In creek bed.
13	Boulder	37.31944	-122.12736	577319	4130667	1	In creek bed.
14	Boulder	37.31913	-122.12682	577367	4130633	4	In creek bed.
15	Boulder	37.31916	-122.12675	577373	4130636	1	In creek bed.
16	Boulder	37.31914	-122.12660	577387	4130634	4x8	Adjacent to the 100-year flood level.
17	Boulder	37.31901	-122.12610	577431	4130620	3x4	In the 100-year flood level.
18	Boulder	37.31877	-122.12511	577519	4130594	6	In creek bed.
N/A	Stream Gauge	37.31844	-122.12456	577568	4130558	N/A	At the bottom of Kaiser Cabin Road
19	Boulder	37.31642	-122.11895	578067	4130339	2	Boulder split into two parts in the 100-year flood plain.
20	Boulder	37.31647	-122.11859	578099	4130345	4x5	In the 100-year flood plain.
21	Boulder	37.31649	-122.11859	578099	4130347	5	In the 100-year flood plain.
22	Boulder	37.31657	-122.11860	578102	4130356	2.5	In the 100-year flood plain.
23	Boulder	37.31661	-122.11849	578108	4130360	2	Adjacent to 100-year flood plain
24	Boulder	37.31670	-122.11842	578114	4130370	2	In the 100-year flood plain.
25	Cluster of 4 boulders	37.31673	-122.11842	578114	4130374	1,1.5,1.5,2	Adjacent to 100-year flood plain
26	Boulder	37.31678	-122.11852	578105	4130379	2	Adjacent to 100-year flood plain
27	Boulder	37.31704	-122.11807	578144	4130408	3.5	In the 100-year flood plain.
28	Boulder	37.31725	-122.11800	578150	4130432	2.5	In the 100-year flood plain.
29	Boulder	37.31762	-122.11681	578256	4130474	2	In creek bed.
30	Boulder	37.31763	-122.11681	578256	4130475	4	In creek bed.
31	Boulder	37.31761	-122.11608	578320	4130473	3x5	In the 100-year flood plain, adjacent outcrop is limestone.
32	Boulder	37.31759	-122.11624	578306	4130471	2.5	In the 100-year flood plain, adjacent outcrop is limestone.
33	Cluster of 11 boulders	37.31758	-122.11625	578305	4130470	Max size 2.5 feet, average 1.5 feet.	In and adjacent to the 100-year flood plain, adjacent outcrop is limestone.
34	Boulder	37.31756	-122.11610	578319	4130468	2	Adjacent to 100-year flood plain
35	Boulder	37.31758	-122.11608	578320	4130470	3	In the 100-year flood plain.
		37.31758	-122.11608	578320	4130470		East of this location Permanente Creek flows through an area where the bedrock is limestone, the majority of the boulders present are limestone, and it is difficult to distinguish boulders resulting from mining activities from those that are naturally occurring.

APPENDIX A

Best Management Practice
for
Removal of Limestone Boulders from Permanente Creek

Introduction

This best management practice (BMP) is designed to remove limestone boulders from Permanente Creek. The BMP is intended to address water quality concerns that limestone boulders in the creek have the potential to leach selenium into surface waters. The BMP, as described below, requires the identification and removal of limestone boulders.

Objective

This BMP requires the removal of limestone boulders in Permanente Creek which meet the requirements listed below:

- Have a surface composition of limestone, guided by visual identification and field testing;
- Located within the reclamation plan amendment boundary and upstream of the existing Pond 13;
- Located within the 100-year floodplain or on slopes immediately adjacent to the creek; and
- Presence in Permanente Creek is attributable to mining activities, rather than naturally occurring.

The term "boulder" refers to rocks greater than 10 inches in diameter. This BMP does not affect the operator's responsibility to remove sediments and smaller-sized material from the creek pursuant to the terms of the reclamation plan amendment.

Field Inspection and Flagging

Field inspection and testing will be performed by a qualified geologist to identify limestone boulders for removal. The inspection will occur during the dry season (prior to October 15) after approval of the reclamation plan amendment. The field inspection will identify limestone boulders using visual identification and field testing. Boulders that are identified by these means will be flagged using tape, stakes, non-toxic paint, or other appropriate means to allow subsequent identification. Boulders identified during the field inspection also will be mapped (in GPS format, where possible) for reference.

Removal Timing and Methods

Limestone boulders identified for removal during the field inspection will be removed during the first available dry season following field identification. This means, generally, that field inspection occurs during the spring or summer of August 2012, boulders will be removed by October 15, 2012.

Limestone boulders will be removed using the following methods:

- By hand where possible.
- By excavator arm where boulders are sufficiently close to access roads.
- By cable and winch, drawn uphill from access roads, where surface vegetation can be preserved.
- By a suspended cable system suspended above the creek, affixed to a tree or other anchor point on the far side of the creek and to a winch on the uphill side.
- By breaking oversize boulders into manageable sizes using a jackhammer or other splitting methods and transporting them using other methods listed here.
- By other appropriate means that are sufficiently protective of the creek and watershed.

Limestone boulders that are marked for removal may be allowed to remain where removal (a) has the potential to significantly destabilize the creek channel or increase the mobilization of sediment in surface waters, and (b) an evaluation indicates the boulder is not a significant source of selenium.

Reporting

A report will be provided to the County within sixty (60) days of the conclusion of boulder removal. The report will describe the field inspections, the removal process and document the basis for leaving any limestone boulders not removed. The report will include a map showing where limestone boulders were removed and limestone boulders left in place.

APPENDIX B

GEOCON
CONSULTANTS, INC.
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. S9325-06-09
August 1, 2012

VIA ELECTRONIC MAIL

Gregory Knapp
Lehigh Hanson
Director Environmental Region West
12667 Alcosta Blvd Suite 400
San Ramon, CA 94583

Subject: PRELIMINARY BOULDER REMOVAL EVALUATION
PERMANENTE QUARRY
CUPERTINO, SANTA CLARA COUNTY, CALIFORNIA

Dear Mr. Knapp:

We are pleased to provide this preliminary boulder removal evaluation for the identification of limestone boulders in Permanente Creek. Lehigh Southwest Cement (Lehigh) prepared an Amended Reclamation Plan for the Permanente Quarry in Cupertino, California (the Site). The San Francisco Regional Water Quality Control Board (SFRWQCB) has concerns regarding water quality associated with limestone boulders in Permanente Creek. The SFRWQCB is concerned that limestone boulders in the creek have the potential to leach selenium into surface waters. As a result, Lehigh is required to remove potential selenium-generating boulders from that portion of Permanente Creek adjacent to the west materials storage area (WMSA) on the Site as part of the reclamation process. Lehigh incorporated a best management practice (BMP) for limestone boulder removal into the Amended Reclamation Plan. The BMP identifies the requirements for the removal of limestone boulders from Permanente Creek. The purpose of this preliminary evaluation was to determine the approximate distribution of boulders attributable to mining activities and to specify those procedures that will be followed in order to identify those limestone boulders in Permanente Creek that will be subject to removal.

OBJECTIVE

The BMP requires the removal of limestone boulders in Permanente Creek which meet the requirements listed below:

- Have a surface composition of limestone, guided by visual identification and field testing;
- Located within the reclamation plan amendment boundary and upstream of the existing Pond 13;
- Located within the 100-year floodplain or on slopes immediately adjacent to the creek; and
- Presence in Permanente Creek is attributable to mining activities, rather than naturally occurring.

The term "boulder" refers to rocks greater than 10 inches in diameter. For the purposes of identifying boulders for removal, "immediately adjacent to the creek" is defined as boulders that are within 10 feet of the 100-year floodplain. The determination that a boulder is attributable to mining activities will be based on the boulder being located upstream of the known limestone outcrops on the Site and does not exhibit a shape or weathering pattern consistent with naturally occurring limestone boulders on the Site.

Field Inspection and Flagging

Field inspection and testing to identify limestone boulders for removal will be performed by David Bieber, a California Certified Engineering Geologist (CEG No. 2092) familiar with the geology and mineralogy of the materials mined at the Permanente Quarry. A preliminary evaluation was performed on July 31, 2012, and the inspection will be completed on August 2 and 3, 2012, during the dry season (prior to October 15) and after approval of the reclamation plan amendment. During the field inspection we will identify limestone boulders visually and field testing, as necessary to identify boulders of questionable composition. Field testing will be performed by putting a few drops of diluted hydrochloric acid on suspect boulders and observing whether there is a strong effervescence. Boulders that are identified by these means will be marked with an identifying number using non-toxic paint or other appropriate means to allow subsequent identification by Permanente staff for removal. Boulders identified as limestone during the field inspection will also be mapped for reference using a global positioning system (GPS). GPS data will be collected using the Universal Transverse Mercator (UTM) coordinate system and datum used by Lehigh for the quarry. If there are multiple boulders in contact with each other in a single pile, they will be numbered and located as a single boulder, but the number of individual boulder clasts making up the pile will be noted to the extend practical.

Reporting

A report will be prepared and provided to Lehigh within ten days of the conclusion of the final field inspection. The report will describe the field inspection methods and will include a spreadsheet and a Microsoft Excel data file listing the boulder number, the UTM coordinates for each numbered boulder, and the approximate boulder size or number of boulders in a pile, as applicable.

PRELIMINARY EVALUATION FINDINGS

Based on our preliminary evaluation, most of the boulders subject to removal occur upstream of Pond 4 near the east end of the WMSA. Limestone outcrops are present in and on the canyon walls adjacent to Permanente Creek in the area from Pond 13 to approximately 2,000 feet upstream of Pond 4. In the area where there are limestone outcrops, much of Permanente Creek has a rocky bottom of in-place limestone. Limestone boulders of a colluvial origin are present in Permanente Creek throughout the area of and downstream from where the limestone outcrops. Due to the blocky nature of the natural fracture pattern in the limestone on the Site, boulders attributable to mining activities and freshly deposited colluvial boulders cannot generally be readily distinguished. Therefore, the section of Permanente Creek throughout the area of and downstream from the limestone outcrops will be assumed to have had a natural origin unless a limestone boulder can be obviously attributable to mining activities.

Please contact the following if you have questions about this evaluation.

Sincerely,

GEOCON CONSULTANTS, INC.

PROFESSIONAL GEOLOGIST
8/31/12
DAVID W. BIEBER
No. 2092
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

David W. Bieber, PG, PGP, CEG, CHG
Senior Geologist

Jim Brake, PG
Associate/Senior Geologist