County of Santa Clara

Department of Planning and Development
Planning Office

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www.sccplanning.org

April 6, 2016

Christina Reese
State Office of Mine Reclamation
801 K Street, MS 09-06
Sacramento, CA 95814

[CERTIFED MAIL]

SUBJECT: 2015 Financial Cost Estimate - Stevens Creek Quarry
January 2016 - Supplement to July 2015 FACE
County Planning Office File #1253-15PAM
State Mine ID # 91-43-0007

Dear Ms. Reese:

The County received the 2015 Financial Assurance Cost Estimate (FACE) for the Stevens Creek Quarry (Mine ID #91-43-0007) in July 2015, and requested the mine operator provide additional documentation and/or modifications. The supplemental documentation, titled Supplement to July 2015, dated January 2016, Benchmark, is Attachment A to this letter. The County submits this documentation to the State Office of Mine Reclamation (OMR) for a 45-day review in accordance with SMARA, PRC §2774(c) and (d).

The 2015 FACE to reclaim the current quarry conditions increased $1,573,033.45 from the prior year, and totals $2,304,756.29. On November 30, 2015, the County approved the replacement surety bond totaling $2,304,756.29, issued by Liberty Mutual Insurance Company. A copy of the approval and surety bond is Attachment B to this letter.

Following is a summary of the 2016 Supplemental documentation and County's response:

1. Boundary Amendment and Dam: Mine operator filed for a pre-application for the lot line adjustment, March 2016, to assess the requirements for amending the parcel line near the upper settling basin. Following completion of the pre-application, the mine operator will apply for a lot line adjustment and record the amended parcel map. The process timing for both applications is approximately six months. **This item remains as an open issue pending recordation of the new Parcel Map.**

   Regarding the dam impoundment, the mine operator contacted the California Department of Water Resources. The County has not received a determination from the

Department of Water Resources. **This item remains as an open issue pending receipt of a determination from the Department of Water Resources.**

2. Stockpiled overburden and fill estimate: Stevens Creek quarry submitted a report estimating the amount of overburden on site and fill required estimate. This report is included in the Supplemental documentation. Based on the report, it appears there is adequate overburden to complete reclamation for the current state, and no import fill is necessary. **County accepts mine operator response.**

3. Geological assessment and monitoring: Mine operator submitted a report, prepared by Sandy Figures with Norfleet Consultants. This report is included in the Supplemental documentation. On March 18, 2016, the mine operator stated in verbal communications with the County inspector that they have contracted with Sadek Derrega, CEG, to prepare a new geological assessment. The estimated date for submittal to the County is end of April 2016. **This item remains as an open issue pending receipt of the new geological assessment report, submitted to the County Planning Office for review and comment by the County Geologist.**

4. Retaining wall for rock crusher relocation: The cost for demolition of the new rock crusher retaining wall would be the same as the prior rock crusher retaining wall, which is included in the 2015 FACE. Also, the mine operator applied for the building permits associated with the retaining wall and rock crusher in 2015, and these are in the County plan checking and review process. **County accepts the mine operator response.**

5. Recycled material stockpiles: Mine operator submitted a valuation report of the stockpiled material and cost estimate to remove the stockpile. The mine operator stated they are working to reduce the material stockpile height, verbal communications with the County on March 18, 2016. **County accepts the mine operator valuation report and verbal response to reduce the concrete stockpile.**

6. Scraper cost reduction: Mine operator provided clarification on the calculations. **County accepts the mine operator response.**

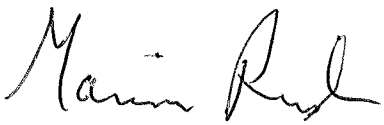
7. Task 1.3 clarification regarding water truck: Mine operator provided clarification on the calculations. **County accepts the mine operator response.**

8. Reclamation acreage: Mine operator provided clarification on the calculations. **County accepts the mine operator response.**

9. Sediment ponds material disposal cost estimate: Mine operator provided clarification on the calculations. **County accepts the mine operator response.**

The Mine Operator communicates the Stevens Creek Quarry will continue working to complete these remaining items. If you have any questions or comments in response to the enclosed documents, please contact me at (408)299-5784 or marina.rush@pln.sccgoc.org.

Sincerely,



Marina Rush, Senior Planner

cc. Jason Voss, Stevens Creek Quarry

Enc.

1. Attachment A: Stevens Creek Quarry Supplement to July 2015 Financial Cost Estimate, dated January 2016, prepared by Benchmark.

2. Attachment B: Stevens Creek Quarry Financial Assurance Approval, Santa Clara County, dated November 30, 2015.

ATTACHMENT A

STEVENS CREEK QUARRY

CALIFORNIA SURFACE MINING & RECLAMATION ACT

SUPPLEMENT TO JULY 2015 FINANCIAL ASSURANCE COST ESTIMATE

CA Mine ID # 91-43-0007

JANUARY | 2016

Lead Agency
Santa Clara County, Planning Office
County Government Center, 70 West Hedding Street, San Jose, CA 95110

Operator
Stevens Creek Quarry, Inc.
12100 Stevens Canyon Road, Cupertino, CA 95014

Preparer
Benchmark Resources
2515 East Bidwell Street, Folsom, CA 95630

BENCHMARK
RESOURCES

TABLE OF CONTENTS

INTRODUCTION 1

SUPPLEMENTARY INFORMATION 1

1. **Boundary Amendment and Dam** 1
2. **Stockpiled Overburden and Fill Estimate** 1
3. **Geological Assessment and Monitoring of Fill Against Cut Slope** 2
4. **Retaining Wall for Crusher Relocation** 3
5. **Recycled Material Stockpiles** 3
6. **Scraper Cost Reduction** 4
7. **Task 1.3 Clarification** 4
8. **3rd Party Material Cost Estimates** 4
9. **Reclamation Acreage** 4
10. **Sediment Ponds** 4

APPENDICES

Appendix A Santa Clara County Letter dated 10-26-15
Appendix B Pond Volume Survey
Appendix C Fill Volume Verification
Appendix D North Slope Geotechnical Report
Appendix E Fill Compaction Verification
Appendix F Stockpile Valuation
Appendix G Seed Quote

INTRODUCTION

An Updated Financial Assurance Cost Estimate (FACE) was prepared and submitted to Santa Clara County (County) in July, 2015 in accordance with the California Surface Mining and Reclamation Act (SMARA) requirements. On October 26, 2015, the County requested additional information, which was provided by letter from Stevens Creek Quarry, Inc. (SCQ) on December 1, 2015. This document formalizes the information provided as a Supplement to the July 2015 FACE.

SUPPLEMENTARY INFORMATION

The responses are organized to numerically correlate with the itemized questions in the October 26, 2015 letter, provided in Appendix A.

1. Boundary Amendment and Dam

Figure 11 of the 2008 Reclamation Plan Amendment correctly showed the ponds used as settling basins. Those same ponds are also shown on Sheet 2 of the 1983 Reclamation Plan and have not changed. While the 2007 amendment should have reflected a lot-line adjustment filed in 1993 to address the use of these ponds (see attached), we have determined that, for whatever reason, the adjustment is not on record at the County Recorder's Office. Thus, SCQ is updating the record of survey and refiling the County application for lot-line adjustment. The ponds are intended to remain at reclamation, as indicated in the approved plans; therefore, the financial assurance costs for reclamation are for vegetating the surrounding area.

The cited impoundment is not a dam subject to California Division of Safety of Dams (DSOD) regulation because, while the impoundment's height is more than 50 feet, its storage capacity, based on a recent confirmation survey by Meridian Survey Engineering, is approximately 5 acre-feet, which is less than the DSOD jurisdictional dam size (http://www.water.ca.gov/damsafety/jurischart/ index.cfm). The survey and pond volume calculation are provided in Appendix B.

2. Stockpiled Overburden and Fill Estimate

a. Andrew Heinemann, a California Registered Professional Geologist (License # 9171) and mining engineer, has confirmed the calculations as provided in a Technical Memorandum provided in Appendix C. If the

quarry were to cease operation and close now, approximately 1,450,000 cubic yards of fill would be required to construct the 2H: 1V slope against the quarry highwalls in Parcel B. This volume was calculated by comparing digital terrain models developed from specific survey data collected in the field from Parcel B area. The data represent current conditions as of July 2015. This volume represents the volume of fill material required to meet the slope requirements of the reclamation plan. These volumes do not represent fill requirements based on the final pit depth and configurations that would occur at the end of the ultimate mine life in the future. Moreover, the figures shown in the July 2015 FACE were developed from the most recent available aerials from February 2014, which, while acceptable for estimating purposes, were recognized as not fully reflecting the surfaces in July 2015. The figures prepared were intended to show the site area and relative reclamation areas and required activities. These figures were not intended to be used for detailed volume calculations or any type of engineering work, but are sufficient for estimating financial assurance costs, especially because the volumes are actively changing. On-site data collected by SCQ in July improved the accuracy of the initial calculations made from the aerial mapping.

b. No imported fill is needed to meet the approved slope requirements at this time. The fill available on site exceeds the 1,450,000 cubic yards. Digital terrain models developed from recent survey data in the field were used to calculate the volume of fill available on-site for reclamation. These calculations indicate that the fill available in both Parcels A and B exceeds 2,285,000 cubic yards. The amount of fill available was determined by subtracting current and reclaimed surfaces using digital terrain models. No detailed calculation sheets are necessary or were produced for this type of work. Regardless, the excess volume (40 percent more fill than needed) should supersede concern regarding discrepancies.

3. Geological Assessment and Monitoring of Fill Against Cut Slope

a. As you are aware, the County noted issue 5 in Attachment A to the annual inspection report. SCQ coordinated with County Geologist Jim Baker, and our geotechnical engineer, Dr. Sands Figures with Norfleet Consultants. Dr. Figures determined that the observations made do not represent instability, and prepared a geotechnical report, provided in Appendix D. No changes to the financial assurance related to this issue are warranted.

b. The approved end use for this mine site is open space. Fill requirements for open space do not need to meet compaction requirements, such as those for commercial buildings or residential homes. The purpose of the Surface Mining and Reclamation Act's requirement for an annually adjusted FACE is to estimate the costs for reclamation if it were to be required this year, not the costs for placement of fill that would be required at completion of the operation as described in the approved plan. If SCQ were to close this year and the County were required to complete reclamation, placement of the 1,450,000 cubic yards of fill would not require an extended project of more than 1 year. The geotechnical monitoring cost provided in the FACE is for 2 years after the fill is placed. No continuous oversight of the fill compaction is necessary because the methods that would be used typically result in fill placement above 85 percent compaction. This level of compaction is sufficient for open space reclamation and is consistent with the 2008 geotechnical analysis for the approved reclamation plan.

As a matter of course, SCQ regularly monitors its fill placement and compaction for its own construction satisfaction. Bay Area Geotechnical Engineers regularly tests compaction when final fill is being placed. Final fills placed at the quarry are shown to exceed 90 percent compaction. A memorandum documenting verification of fill compaction is provided in Appendix E.

4. Retaining Wall for Crusher Relocation

The July 2015 FACE included the cost to demolish the rock crusher concrete in Task 3.1 (concrete demolition totals $18,750). As you are aware, the new retaining wall was constructed this summer to relocate the crushing plant. The existing plant has now been relocated and the old wall removed. For purposes of the FACE, the costs to demolish the new wall would be the same as they were for the old retaining wall.

5. Recycled Material Stockpiles

Please see the valuation, provided in Appendix F of recycled concrete as base rock at 10.50 per ton. The current stockpile volume is approximately 30,000 tons, representing a total value of $315,000, which substantially exceeds the cost of removal. Reclamation and revegetation of the area was already provided in the July 2015 FACE.

6. Scraper Cost Reduction

Task 1.2 lists two scrapers with a combined production rate of 1,250 cubic yards (working together) per hour at a cost of $366.01 (for each scraper) per hour for a total of 1,162 hours to move and place 1,451,885 cubic yards of fill. The total cost calculation is:

1,45185 cubic yards ÷ 162 cubic per hour x $366.01 x 2 scrapers.

Each scraper will need to work 1,162 hours each, at the same time. In other words, the two scrapers will work together for 1,162 hours. The total scraper hours is 2,324 hours. Therefore, the FACE calculation is correct.

7. Task 1.3 Clarification

SCQ currently uses a single water truck to control dust adequately on all active surfaces. In the FACE, a water truck was included for the longest running task, which is the movement of fill under Task 1.2, for which 1,162 hours were assigned for a water truck. Task 1.3 is a related task for adjacent fill movement during the same time period; therefore, the same water truck was assumed to satisfy that need. Planning for a water truck for continuous presence during the longest running reclamation task is a standard FACE practice.

8. 3rd Party Material Cost Estimates

The Pacific Coast seed quote is attached in Appendix G.

9. Reclamation Acreage

The 100-acre revegetation acreage was developed based on updated mapping for the July 2015 FACE and is considered an accurate measurement. The previous acreage used in 2014 is therefore considered an overestimate. The difference does not reflect reclaimed acreage.

10. Sediment Ponds

The cost to dispose of the material removed from the ponds is covered in the cost of the overall material handling from the scrapers for the first year, and at 2,000 cubic yard per year, the cost is negligible compared to the overall cost. Much of the sediment will be set aside and used to maintain berms. After vegetation is established, the sediment pond will not need to be mucked

out. Future cost associated with the sediment pond could be covered from the contingency portion of the budget.

The 2008 Reclamation Plan Amendment was approved with an updated standard:

Performance standards to be met prior to release of revegetation financial assurance shall include grasses and forbs cover value of 75%, and a species richness of five (5) species.

The methods employed to meet the cover and species richness were at the operator's discretion. While we have previously included hydroseeding costs in the FACE, broadcast seeding is expected to be more effective. Under issue 1 in Attachment A to the 2015 Inspection Report, the County recommended completing test plots by September 1, 2016. Based on this comment, SCQ will plan on testing both reseeding methods to determine which should be used.

Stevens Creek Quarry has been in operation for over 50 years. The quarry configuration and surrounding surface disturbance are well established and have remained virtually unchanged for decades, as the materials are mined from increasing depths within the quarry. Substantial fill has also been stockpiled for completion of fill slopes.

APPENDICES

APPENDIX A

SANTA CLARA COUNTY LETTER DATED 10-26-15

County of Santa Clara

Department of Planning and Development
Planning Office

County Government Center, East Wing, 7th Floor
70 West Hedding Street
San Jose, California 95110-1705
(408) 299-5770 FAX (408) 288-9198
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October 26, 2015

Mr. Jason Voss
Stevens Creek Quarry
12100 Stevens Canyon Road
Cupertino, CA 95014

SUBJECT: 2015 Financial Cost Estimate Stevens Creek Quarry
County Planning Office File #1253-15PAM
State Mine ID # 91-43-0007

Dear Mr. Voss:

This letter is to advise you that the 2015 Financial Assurance Cost Estimate (FACE) for the Stevens Creek Quarry (Mine ID #91-43-0007), dated July 2015 and prepared by Benchmark, was forwarded to the State Office of Mine Reclamation (OMR) for a 45-day review as required under SMARA, PRC §2774(c) and (d). The current estimate reflects a cost of $2,304,756.29 to reclaim the current quarry conditions, and the financial assurance (FA) mechanism, surety bond issued by Liberty Mutual Insurance Company, currently totals $653,408.99. As such, please revise the surety bond, accordingly, and submit to the County no later than December 31, 2015.

The County has completed its review of your 2015 FACE. We find that the documentation submitted does not provide adequate detail to determine whether all costs for reclamation in accordance with the approved reclamation plan have been included. In accordance with California Code of Regulations Title 14, Section 3804(a) the cost estimate should be "based on:

- an analysis of the physical activities and materials necessary to implement the approved reclamation plan;
- the agency's unit costs, or costs for third party contracting, for each of these activities, if applicable;
- the number of units of each of these activities, if applicable..."

The SMGB website provides guidance that can be used to prepare financial cost estimates at http://www.consrv.ca.gov/SMGB/guidelines.htm. Please provide include complete work descriptions and/or documentation with adequate details to evaluate the costs for reclamation for the following items:

1. **Boundary Amendment and Dam:** Figure 11 in the RPA shows that three existing settling basins will remain at the completion of mining. The County observed an area outside the current reclamation plan boundary and property line that included a portion of the Upper Settling Basin and an earthen dam (approximately 47 feet height) located between Upper

Settling Basin and Middle Settling Basin. The FACE should include cost estimates to reclaim these areas outside of the reclamation boundary.

2. **Stockpiled Overburden and Fill Estimate:** The cost estimate in Task 1.2 is based on the placement of 1,451,885 cubic yards of engineered fill at a slope of 2H:1V against the 0.5H:1V cut slopes in Parcel B. The RPA Figures 8 and 17 shows the final highwall cut slope and toe fill dimensions, respectively. Based on the cut slope contours in Figure 8 and the map scale of Figure 17, it appears that the final volume of fill needed to create the 2H:1V fill is much greater than the 1,451,885 cubic yards given in Task 1.2. For example, the west side fill is approximately 2,000 feet long. The fill height is approximately 300 feet as taken from RPA Figure 8. Thus the floor width of the 2H:1V fill is 600 feet, less the offset 150 foot from the 0.5H:1V bedrock, or approximately 450 feet. The cross-sectional area of the fill is approximately 67,500 square feet (300*450/2 = 67,500). The volume on the west side fill is 135 million cubic feet (67,500 * 2000 = 135,000,000) or 5 million cubic yards (135,000,000/27).

   The County requested, through the 2015 SMARA Inspection Report, the mine operator provide to the County the methodology and output of the terrain model.

   a. For purposes of the 2015 FACE, please include a detailed calculation sheet for the current estimate of the volume of the 2H:1V fill being place against the toe of the quarry highwalls in Parcel B. It should include the method for both determining the volume of fill required and the current volume of backfill material currently on site.
   b. Please confirm if imported fill is needed, revise FACE to include calculations for the volume of imported backfill material, or not necessary.

3. **Geological Assessment and Monitoring of Fill Against Cut Slope:**
   County inspectors observed open cracks and vertical displaced scarps on west and north slopes of quarry pit, and the mine operator agreed to obtain a geological evaluation by a certified engineering geologist to analyze potential instabilities or movement that could affect reclamation.

   a. For purposes of the 2015 FACE, upon completion of the geological analysis if it is determined there are modification to the reclamation work, please include the cost and details for completing the work in the estimate.
   b. The current Reclamation Plan calls for the fill placed against the cut slope to be "engineered fill," [pages 4 and 6]. However, Task 1.2 doesn't specify the cost of geotechnical engineering oversight for the fill placement, and Task 5.1 only provides geotechnical monitoring once a year for two years for a total of 24 hours. One twelve-hour visit per year is not adequate for effective oversight of the engineered fill of 1,451,885 cubic yards. Please revise FACE to include additional time for the geotechnical oversite.

4. **Retaining Wall for Crusher Re-Location:** A new retaining wall was observed during the 2015 SMARA inspection and is not included in the Reclamation Plan.

   a. Please revise the 2015 FACE to include costs for reclaiming rock crusher retaining wall.

5. **Recycled Material Stockpiles:** Task 3.1 provides costs for dismantling and transporting crushing equipment off-site including concrete demolition and concrete recycle plant removal, at $30,000.00. Appendix D provides a cost estimate from Bankhead Equipment to document Task 3.1 costs. There is no cost estimate in Task 3.1 or the Bankhead Equipment quote for taking stockpiles of broken concrete and asphalt off-site for disposal or recycling. The operator will provide the County a financial analysis and costing estimate demonstrating the value of the stockpiled materials exceeds the costs for removal and reclamation of the site area.
    a. For purposes of the 2015, please include this analysis in the appendix documentation.

6. **Scraper Cost Reduction:** Task 1.2 lists two scrapers with a combined production rate of 1,250 cubic yards per hour at cost of $366.01 per hour for a total of 1,162 hours to move and place 1,451,885 cubic yards of fill. Based on the combined production rate, the fill can be moved in a total of 1,162 hours if each scraper operates for 581 hours. However, the final cost for this item is given at $850,607.24. This cost appears to be based on each scraper operating for 1,162 hours. Thus, it appears that the cost of the scrapers could be reduced by half. Likewise, the hours and costs for other tasks might be lowered.

    a. The hours and costs for Task 1.2 should be re-evaluated to determine whether the values given in the July 2015 FACE are correct and adjust as needed.

7. **Task 1.3 Clarification:** Task 1.3 is the removal of approximately 46,000 cubic yards of temporary fill by dozing it onto lower slopes. The only costs in this task are for the dozer and operating engineer. There appears to be the need for a separate water truck or some other method for maintaining dust control.

    a. Revise the FACE, Task 1.3, to include cost for water truck and labor or clarify in FACE how the dust will be controlled during the 184 hours of grading.

8. **3rd Party Material Cost Estimates:** Table 1 in the 2015 FACE Appendix C lists the cost for re-vegetation seeds and plants. A footnote to the table states that these costs were taken from quote provided by Pacific Coast Seed in July 2015. However, the actual July 2015 quote from Pacific Coast Seed isn't provided in the FACE.

    a. Revise the FACE to include the July 2015 quote for seed and plants from Pacific Coast Seed.

9. **Reclamation Acreage:** Task 2.1 lists the total area of reclamation re-vegetation at 100 acres. The 2014 FACE documented 117.8 acres under Task 2.1 in the 2014 FACE. Based on the 2015 SMARA inspection, there did not appear to be any areas yet reclaimed and revegetated.
    a. Please correct the acreage in the revised FACE.

10. **Sediment Ponds:** Task 4.1 includes cost for annual 'mucking' of the sediment ponds but does not include costs for disposal of the material removed from the ponds. This item should be added to the work description and the costs should be added to this task.

    a. Sheet 5 of the reclamation plan requires a "...hydroseed slurry..." be applied including specified seed and soil additives. It also requires the additional application of additives after the initial hydroseeding. The work description in Task 2.1 is not clear on how the operator intents to meet this requirement, and the costs of the soil additives are not listed. These items should be added to the work description and the costs added to this task. Also, Sheet 5 of the reclamation plan requires "...prior to the start of revegetating a soil analysis shall be performed. Fertilization rates shall be amended as needed to bring into conformance with soil analysis report recommendations." This required work item was not found in this cost estimate. This item should be added to the work description and the costs added to Task 2.1.

Please provide a revised 2015 FACE and supporting documentation identified to the County of Santa Clara, Office of Planning and Development, attention Marina Rush, **by December 1, 2015.** You may reach me regarding any questions or comments at (408)299-5784 or marina.rush@pln.sccgov.org.

Sincerely,

Marina Rush

Marina Rush, Planner III

cc. Kirk Girard, Director
Rob Eastwood, Planning Manager
Christina Reese, Office of Mine Reclamation
County File # 1253-15PAM

Enc. Attachment A – Stevens Creek Quarry 2015 FACE

APPENDIX B
POND VOLUME SURVEY

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Surface5	full	1.000	1.000	73077.66	8.03	8251.98	8243.96<Fill>

Totals

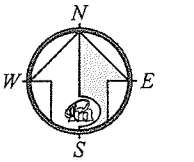
	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	73077.66	8.03	8251.98	8243.96<Fill>

* Value adjusted by cut or fill factor other than 1.0

Volume

8250 = 5.113644

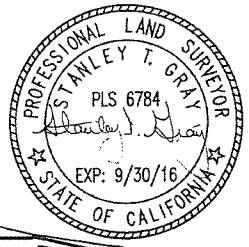
Cubic yard — Acre-foot



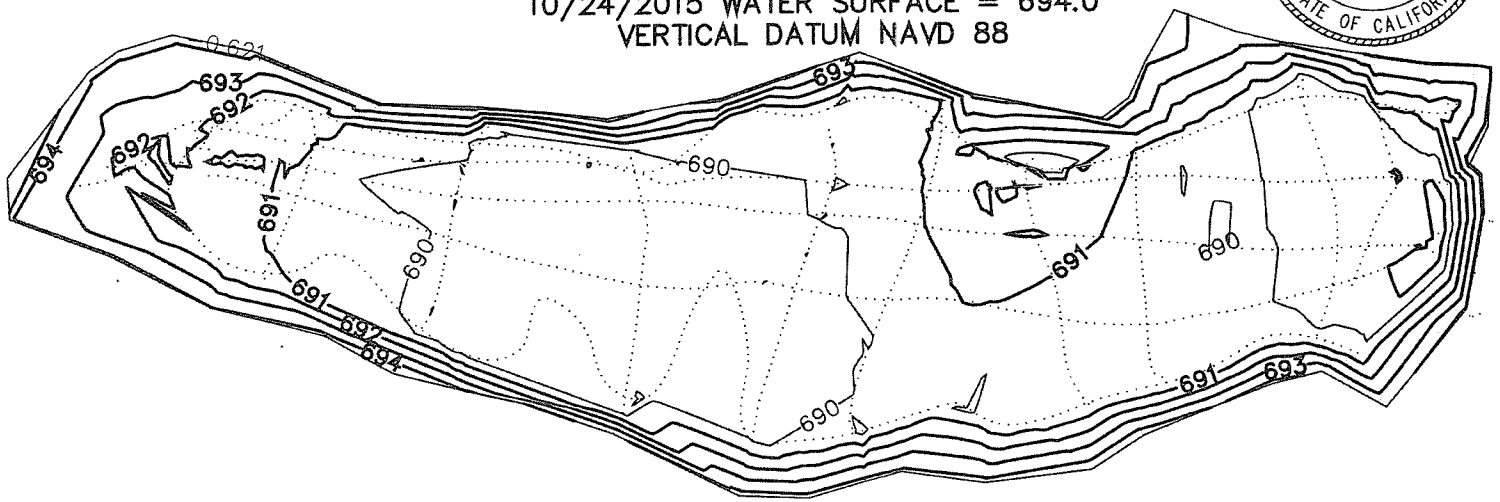
GRAPHIC SCALE

60 0 30 60

1 INCH = 60 FEET



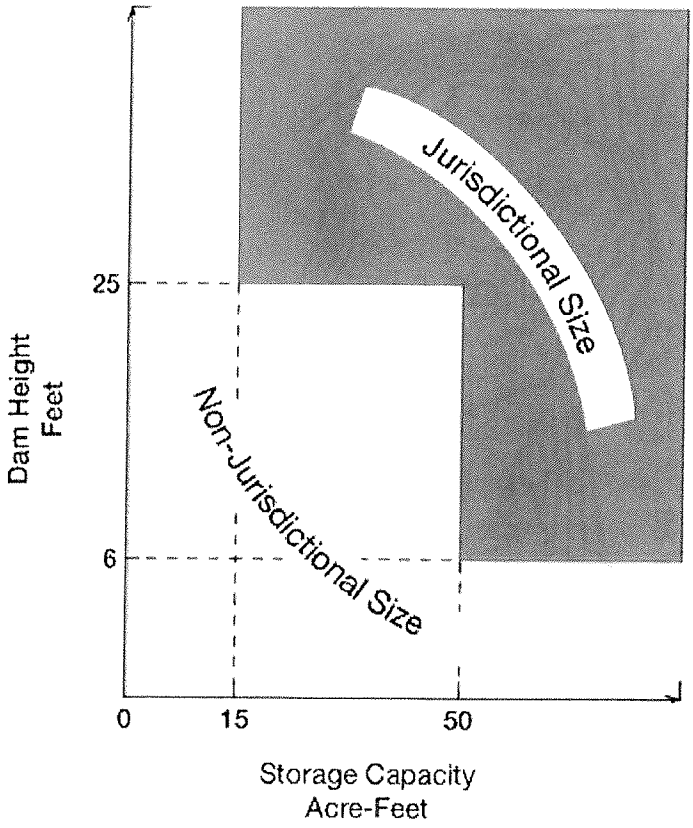
10/24/2015 WATER SURFACE = 694.0
VERTICAL DATUM NAVD 88



STEVENS CREEK QUARRY

MERIDIAN SURVEYING ENGINEERING, INC.
2958 VAN NESS AVENUE
SAN FRANCISCO, CA 94109
(415) 440-4131
(15115)
777 GRAND AVENUE, #202
SAN RAFAEL, CA 94901
(415) 456-5450
surveyrequest@meridiansurvey.com

PROVISIONS OF DIVISION 3 OF THE CALIFORNIA WATER CODE AFFECTING JURISDICTION OVER DAMS AND RESERVOIRS



APPENDIX C
FILL VOLUME VERIFICATION

BENCHMARK
RESOURCES

TECHNICAL REPORT

To:	Jason Voss
From:	Andrew Heinemann, PG
Subject:	Verification of Current Fill Requirements to Meet Reclamation Slopes at Stevens Creek Quarry
Date:	November 24, 2015

Per your request, I have verified the recent calculations for the fill requirements and stockpile volumes at Stevens Creek Quarry (SCQ). I used the DXF files you provided to create my own digital terrain models using Surpac software. I used the resulting models to perform basic volume calculations to spot check and verify the volumes SCQ provided. My results are similar to those of SCQ.

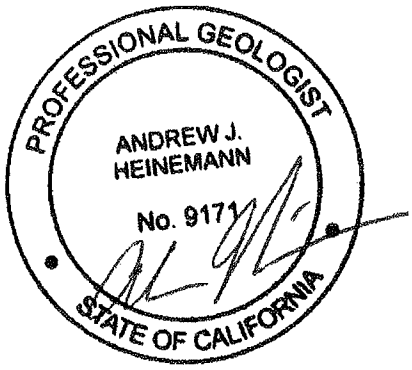
I visited the SCQ November 18, 2015, and inspected the locations where the material take-off survey data were collected. I discussed the methods used with Richard Voss and determined that the methodology and technical tools used to create the basic digital terrain models, which represent the current ground surfaces in Parcels A and B of the Stevens Creek Quarry, are satisfactory and standard for producing volume calculations to estimate costs for financial assurance cost estimating under the California Surface Mining and Reclamation Act.

SCQ collected survey points in the field using a Global Positioning System with a local base station. Points were taken at the top of slope, at slope mid-points, and along the toe of slope. On-site geologic field investigations, historical maps, the survey data, and operator knowledge were used to interpret contacts between native and fill-slope areas. This information was used to develop the digital terrain models for the required fill volumes for the pit area and the available fill currently on-site. The results show that a greater quantity of fill exists on-site than is needed to meet the reclamation slope requirements. The DXF format files can be used in most 3-D software packages to calculate volumes.

SCQ supplied Benchmark Resources with DXF files for:

- Parcel B material stockpile cut,
- Parcel A material stockpile cut,
- fill-pit profile,
- 2:1 fill to top of fill pit, and
- cut fill (3-pole area).

The amount of fill available was determined by SCQ by subtracting current and reclaimed surfaces using digital terrain models. The calculations indicate that the fill available in both Parcels A and B exceeds 2,285,000 cubic yards. Therefore, the fill available on-site exceeds the 1,450,000 cubic yards required to complete the slope requirements; thus, no imported fill is needed.



APPENDIX D

NORTH SLOPE GEOTECHNICAL REPORT

NORFLEET CONSULTANTS

Engineering
Geology
Geohydrology
Geophysics

6430 Preston Ave.
Suite A
Livermore, CA 94551
(925) 606-8595

January 5, 2016

Mr. R. Voss
Stevens Creek Quarry
2100 Stevens Canyon Road
Cupertino CA 95014

Proj. No. 141781.4

RE: Movement on the North Slope of Stevens Creek Quarry, fall, 2015

Dear Mr. Voss,

In the fall of 2015, you contacted me concerning recent movement of the upper and lower parts of the actively mined face in the middle of the north wall of the quarry. This movement was observed by the County Geologist, Mr. Baker in September, 2015. Mr. Baker is concerned that the current movement in the lower face in the north wall has reactivated the slope above this area. These two areas of movement could merge, creating a larger area of instability that could extend beyond the mining boundary and onto the adjacent property.

Background

The north face began to be mined circa 2008. Mining began at the northeast corner of the quarry and progressed westward. The ground surface rises from east to west. The mined face extended from the ground surface down to elevation 750-700 feet. This mining phase finished about mid-2014. During this mining phase, there were slope instabilities in the eastern area in 2008 and in the middle area in 2012-2013. The eastern instability was discussed in a written report, dated January 22, 2008. It was stabilized by construction of an engineered buttress fill. The middle instability was discussed in a written report, dated January 16, 2014. This period of movement was well defined with movement of several feet (Figure 4), but movement features and amounts were (and are) obscured by on-going mining activities. Little to no deformation was visible in the toe area. By late 2013, the entire upper north face had been reconfigured to an overall 1.5 to 1 slope that included seven benches and placement of uncompacted fill along the top of the northeast part of the face (spoil storage). The reconfiguration covered/destroyed many of the existing surface features, making it difficult to compare pre- and post-reconfiguration photographs of the north face. There was some slide movement after reconfiguration, but the movement appears to be small, in the range of a foot or two at the top of the slide (Figure 3). This is an estimate. I did not visit the site between fall 2013 and fall 2015. This zone of instability episodically moves in response to mining and winter rains.

Circa late 2013, mining of the lower part of the northern face (below 700-750 feet elevation) began at the northeast corner of the quarry and progressed west. By mid-2015, mining had reached the middle part of the face, below the middle zone of stability in the upper part of the face. In early fall 2015, the lower part of the excavated face begun to move (Figure 1 and Photo 1). At about the same time, movement in the upper part of the face was observed (benches 1, 2, and 3, Figure 2 and Photos 2 and 3). In November 2015, an engineered buttress was constructed

to provide support to the recently excavated area (below bench 7, photo 4). The buttress extends up to approximately 735 ft. elevation, near the top of the recently excavated section.

A PG&E power line extends east-west along the northern property line of the quarry. The middle pole was moved west circa 2008 in response to the 2008 slope instability. The middle pole was moved east in early 2015, apparently as part of reconfiguration of the perimeter road along the top of the north face. There is no indication that slope instability triggered this pole movement.

Observations

I observed the north face on October 13, November 4, November 19 and December 7, 2015. The north face, as of October 13, 2015, is shown in Figure 1. An unmarked view is shown in Photo 1. The light brown material scattered throughout the face is remnant side cast fill. There are faults above bench 1, but they are not visible because of the angle of the photograph. Faulting at the top of the slope is shown in Figure 2. The fault locations in both figures are based on my field observation between October and December, 2015.

The slope failure below bench 7 is obvious (Photo 1). The face contains the same rock type, but structural variations control the style of failure. The material to the left (west) of the green line is jointed rock (labeled 1 in Figure 1 and Photos 5 and 8). The intact rock in this area is hard. Larger blocks had to be broken with a large impact hammer. The joints in this zone, which are pervasive, have a variable spacing, length, and orientation. Even though the intact rock is quite hard, the joint density sufficiently weakens the rock mass so that it can be excavated. The wide variation in block size illustrates the effect of the joint density and complexity.

The fault marked A (at the lower left side of Figure 1) is an unusual feature (Photo 6). Its orientation is very different and it does not appear to be associated with any other feature. The relative fault displacement is backwards with respect to the slope. The up-hill side of the fault is down with respect to the downhill side. I suspect that this is a stress release fracture. As this part of the slope was excavated, the lateral support was removed, allowing the rock to expand horizontally out of the slope creating this fracture. This type of feature is restricted to this area because of the rock hardness.

The material to the right (east) of the green line is the same rock, but it is highly sheared (labeled 2 in Figure 1 and Photo 7). The shearing is so pervasive that this material has an almost soil-like behavior. Boundary faults of the recent failure are visible, but there is little obvious slide-related faulting within the body of the slide mass. It is likely that this is the upper part of the Berrocal Fault zone that crops out just east of the quarry (Figure 2).

The green line continues up slope but the rock strength differential on either side of the green line reduces because of weathering. In the upper part of the face, the green line is difficult to locate (shown as a dashed line).

It appears that excavation of the sheared rock zone below bench 7 in fall 2015 (Figure 1, location 2) removed basal support from the uphill slide, causing it to reactivate. There was no obviously visible increase in movement of the uphill zone after early November 2015 (Photos 2, 9, 10, and 11). It is unclear if movement of the fractured rock zone (Figure 1, location 1) had any effect on the uphill zone.

Construction of an engineered buttress fill across the sheared and fractured rock zones began in early November 2015 (Photos 4 and 12). The buttress reached elevation 735 in mid-November.

Figure 2 shows the faults at the top of the middle of the north face (Photos 2, 3, 4, 13, 14, 15, and 16). I did not have a recent plan map of this area and used a March, 2015 Google photo as a base. There has been minor reconfiguration of the perimeter road and the eastern storm water retention pond since the photograph was taken. The benches (blue lines) and numbers in both figures are the same.

The current movement does not appear to have extended beyond previous identified movement zones in this area. The eastern boundary is unclear. The area east of benches 2 to 4 is covered with erosional features making identification of faults difficult. I walked benches 1 and 2, but did not walk the lower benches (3 to 6) or the area east of benches 3 and 4.

The uphill scarp (Photos 15 and 16) became visible in November after a series of rains. It is likely that the uphill scarp developed earlier, but it is located in a haul road and had been covered/filled with dust and loose debris that were removed by the December rains. There was no visible increase in movement on these faults in November and December 2015. The northern-most (uphill) scarp extends several hundred feet to the west. The power pole is a few feet below the scarp. Just east of the power pole, the scarp has a 1 to 2 foot offset. North of the power pole, the offset reduces to a few inches (Photo 16).

Figure 3 shows the top of the middle of the north face. It uses the same base as Figure 2, but only the faults that existed at the time of the photograph (March, 2015) are shown. Two faults are visible (black lines) at the top of the slope (above bench 3). These occurred in the same areas as features mapped in 2012 (Figure 4), but their presence in 2013 shows that there was minor slope movement after slope reconstruction. There had been heavy rains in March 2015, sufficient enough to create fresh erosional features. These, combined with the limited resolution of the photograph, make identification/separation of smaller faults questionable. The sun angle is from the south, casting shadows on the north (uphill) side of surface features.

Figure 4 (dated April, 2013) shows the 2012 slope movement on top of north face. Comparison of Figures 2 and 4 shows that the 2015 movement reactivated the 2012 failure.

Conclusions

Excavation of the slope below bench 7 appears to have reactivated the old slide at the top of the face. As a result, a section of bench 1 dropped several feet, and the western side scarp extended down to bench 3. There does not appear to be a well-defined east side scarp. Instead, the movement appeared to be absorbed by an adjacent secondary/parasitic slide. There is no visible toe. The benches between bench 3 and 7 exhibit no gross movement, but a detailed examination of those benches may reveal some movement.

It appears that the slide zones are confined to the sheared rock zone that crops out east of the fractured rock. The green line (Figure 1) marks the boundary between the two rock types. This concept was discussed in my 2012 report and the current pattern of movement supports this idea.

Since the initial movement in early October 2015, there has been no obvious subsequent movement. The construction of the buttress appears to have stabilized the lower part of the slope, returning the upper slope to the stability level it had earlier in the year. The pre-existing slide at the top of the north face has a history of episodic movement. It moves a few feet and then stabilizes until either mining activity or rain reactivates the slide again. Mining is no longer occurring on this slope. Eventually, this part of the quarry will be filled to within about 100 feet of the top of slope.

The primary concern is winter rains. El Nino conditions are projected to develop in mid-January 2016. The surface configuration of the perimeter road and benches 1, 2, and 3 directs surface runoff into open fault scarps where water can then flow down to the failure surface. This can cause the slide to activate. Appropriate water diversion measures should be taken to direct as much surface water as possible away from the head of the landslide. Such measures could include grading, installation of drains, covering ground with plastic and pouring neat cement into wider cracks in roads. These measures would have to be re-evaluated/re-constructed yearly or as needed. I discussed this problem with Mr. Voss in the field during my December site visit.

A large-scale, catastrophic failure has not occurred on this slope. This does not mean that it could not occur, but history suggests that it is unlikely. If one occurs, I suspect that rain will be the causative factor. The large buttress directly to the east of this area should be extended west (Figure 2 and Photo 4) as material becomes available.

Limitations

We have employed generally accepted civil engineering and engineering geology procedures. Our observations, professional opinions and conclusions were made using that degree of care and skill ordinarily exercised, under similar conditions, by civil engineers and engineering geologists practicing in this area at this time. This report is base on reconnaissance level mapping. I did not have a recent plan map of the north face area on which to plot data. No formal slope stability analyses were performed of the slope or the buttress. Opinions concerning slope stability are estimates only. No rock or soil sampling/testing was performed. Norfleet consultants expressly deny any third party liability arising from the unauthorized use of this report.

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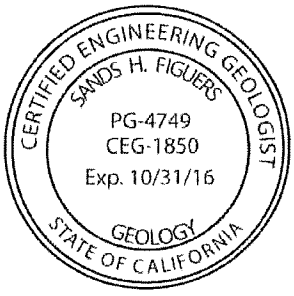

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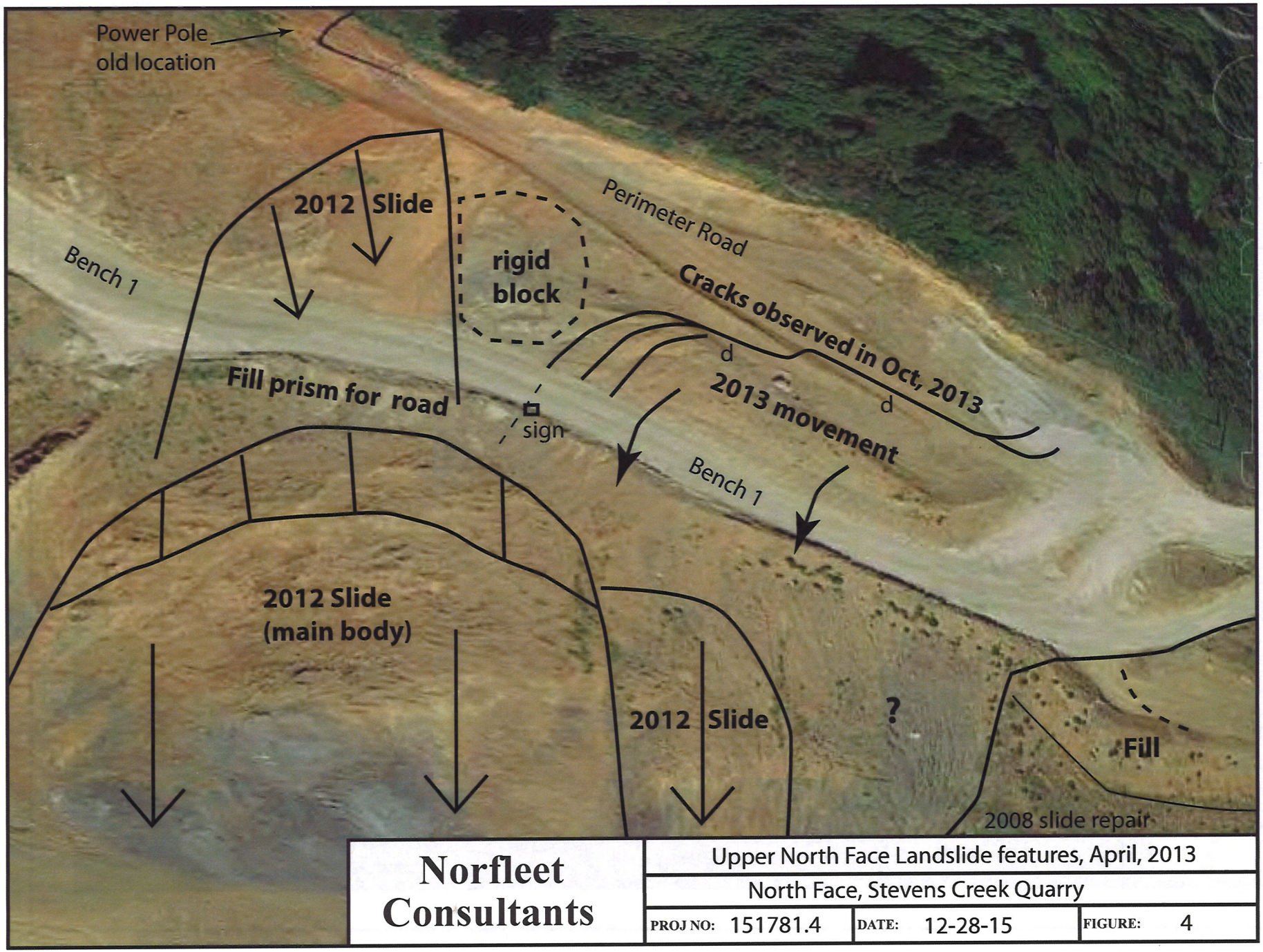
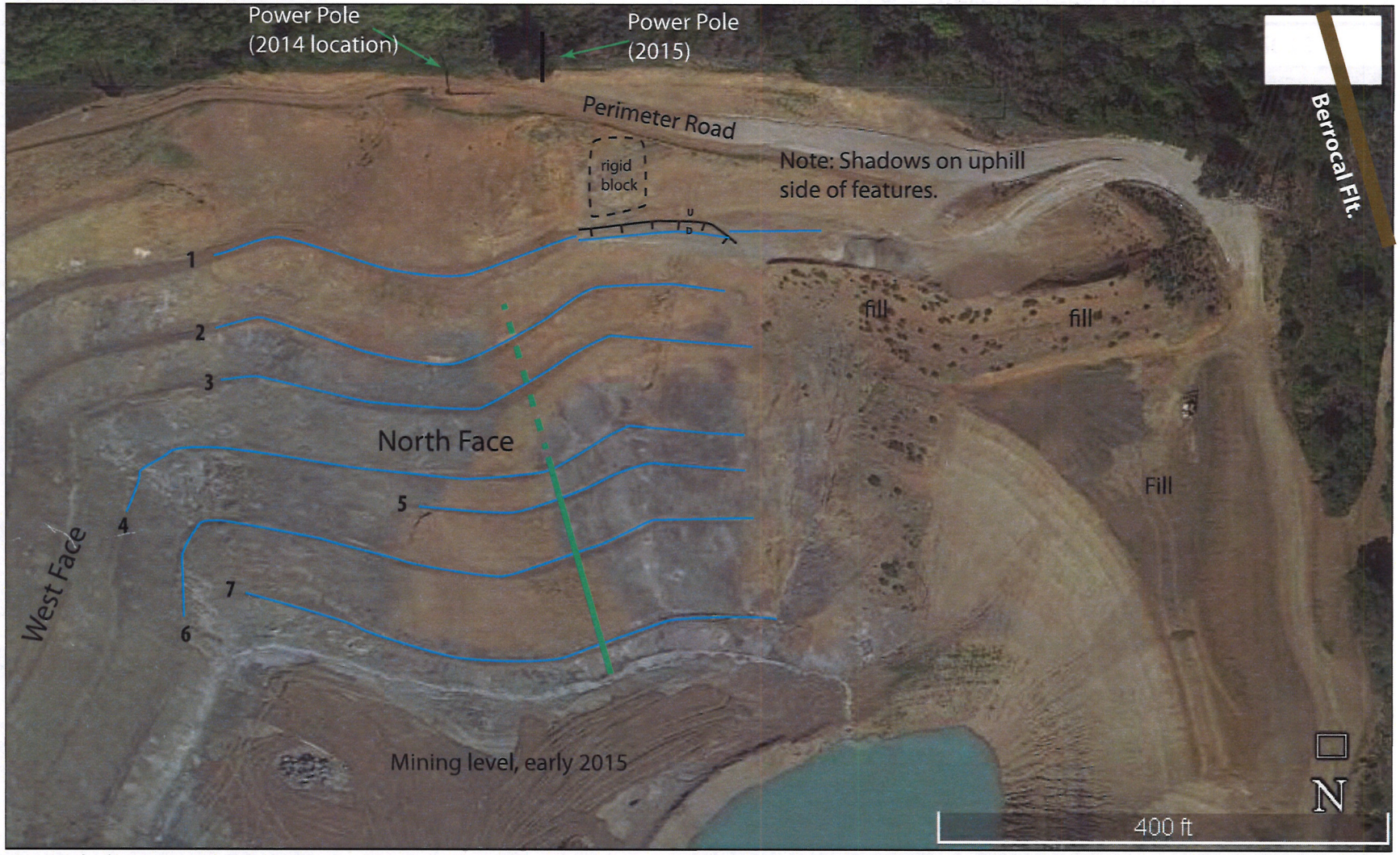


Norfleet Consultants	Upper North Face Landslide features, April, 2013		
	North Face, Stevens Creek Quarry		
	PROJ NO: 151781.4	DATE: 12-28-15	FIGURE: 4



Photograph date - March 28, 2015

Fault/shear with visible offset

Material boundary

Bench

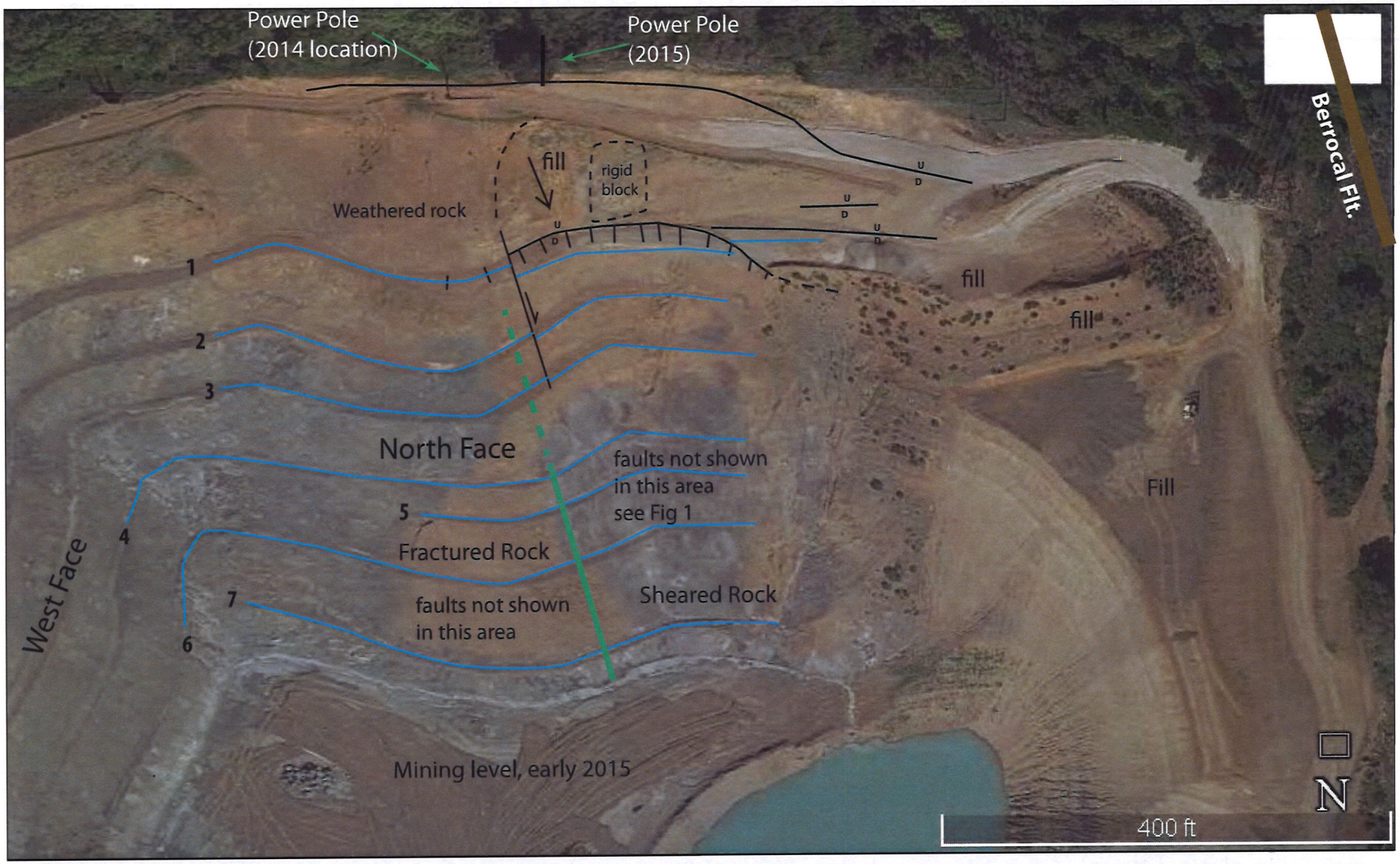
Google Photo

Norfleet Consultants

Upper North face Landslide Features as of March 28, 2015

North Face, Stevens Creek Quarry

PROJ NO:	151781.4	DATE:	12-28-2015	FIGURE:	3



Photograph date - March 28, 2015

Fault/shear with visible offset

Material boundary

Bench

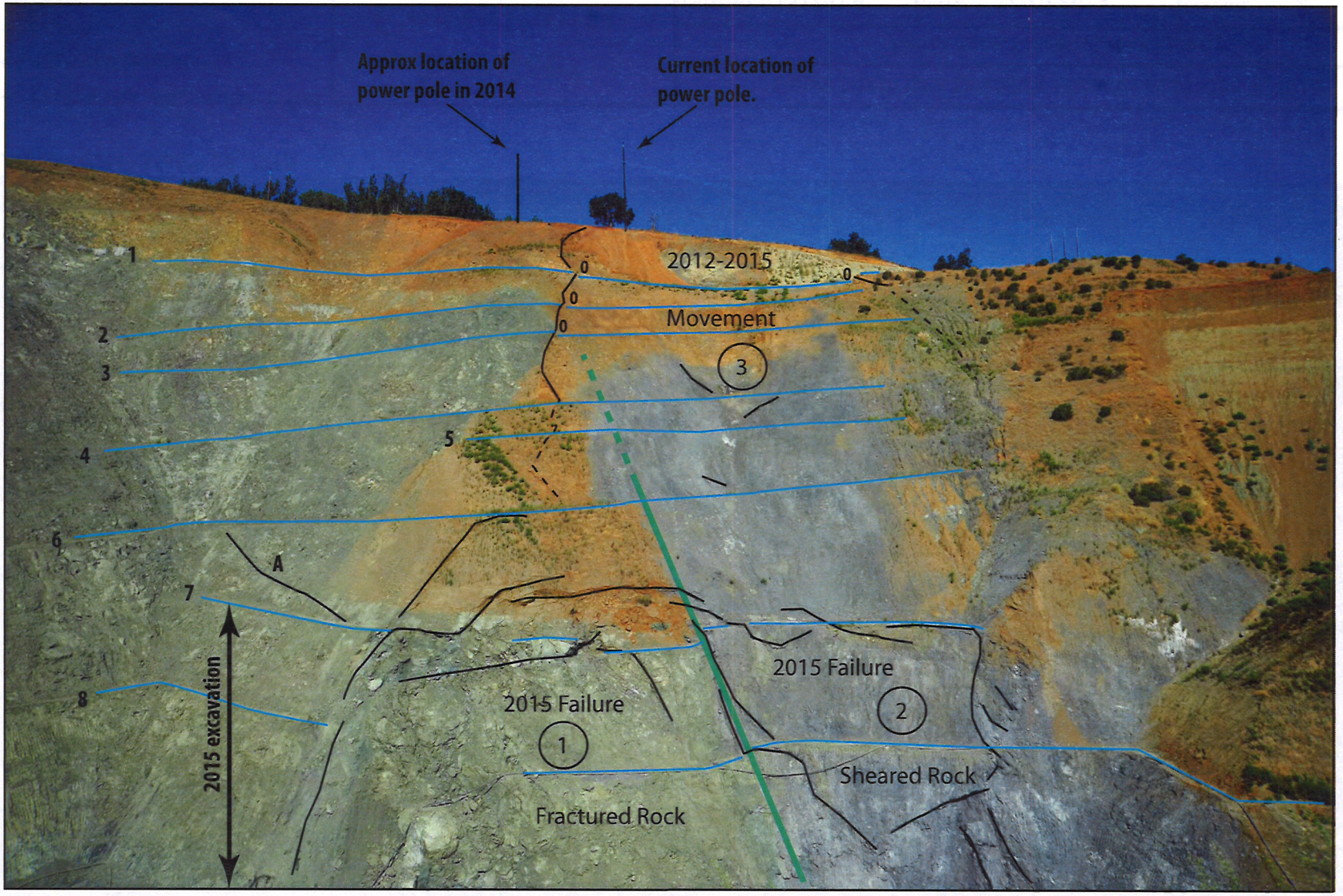
Google Photo

Norfleet Consultants

Upper North face Landslide Features as of Dec. 7, 2015

North Face, Stevens Creek Quarry

PROJ NO:	151781.4	DATE:	12-28-2015	FIGURE:	2



Looking North

0 Observed Offset (see figure 2 for top of slope offsets)

Fault/shear

Material boundary

5 Bench & no. **A**- see text

dsc1985,10-13- 2015

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Fall 2015, Landslide Features on Lower Face

North Face, Stevens Creek Quarry

PROJ NO: 151781.4	DATE: 12-12-2015	FIGURE: 1

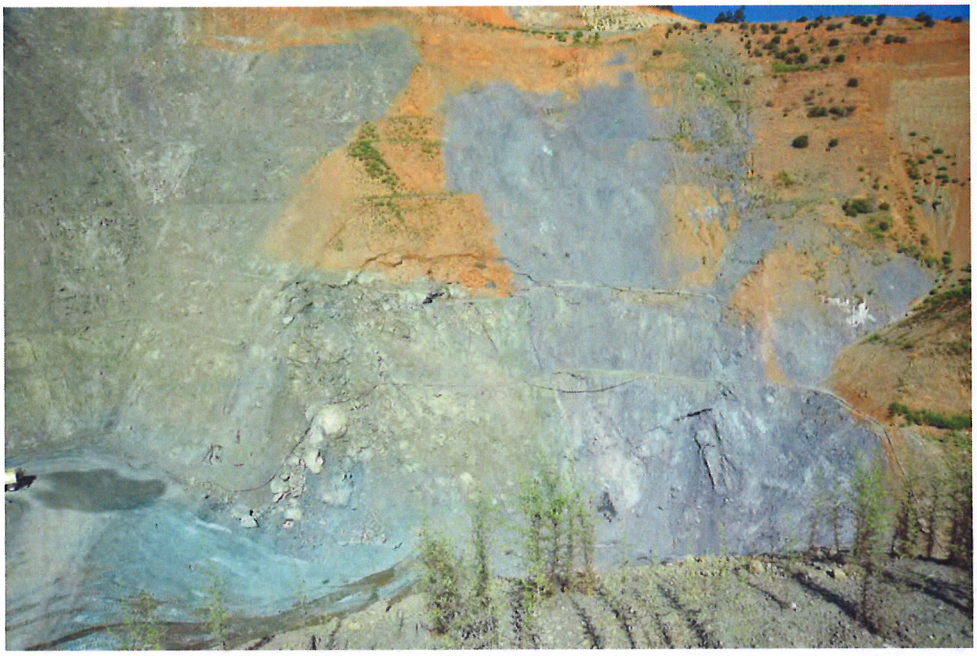

Photo 1: Failure of the lower north face, mid-October. 2015. Looking north.

Photo 2: Movement across bench 1 (Oct 13, 2015). Looking east.

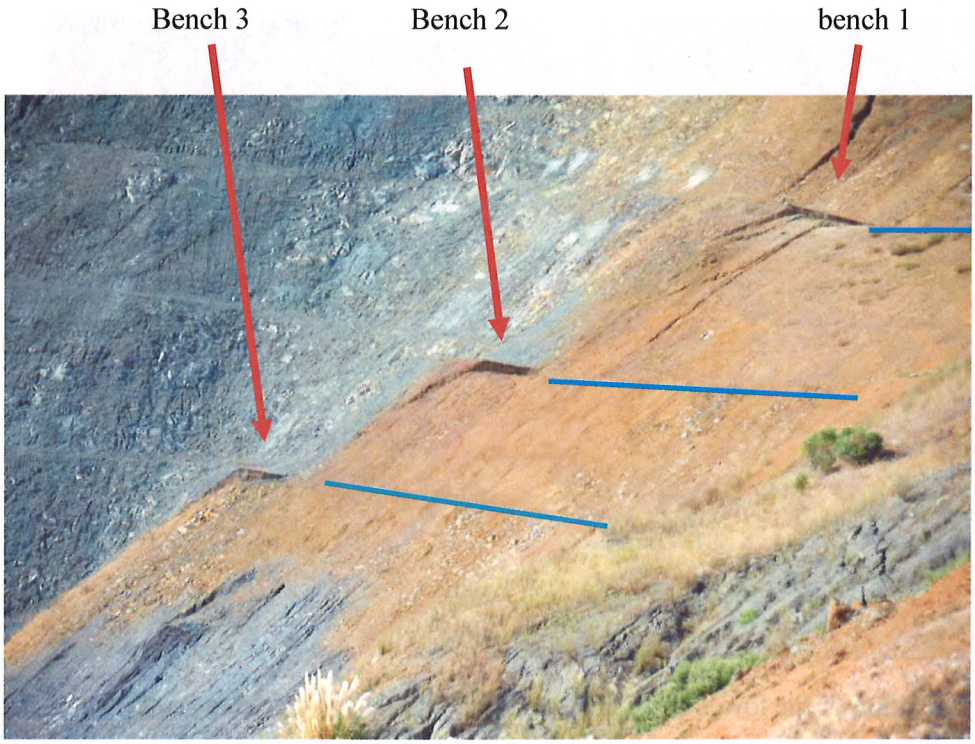

Photo 3: Off set of benches 1, 2 and 3, west side of failure (Nov 4, 2015). Looking west.

Photo 4: Construction of the buttress (arrow), Nov 19, 2015. Looking northeast.

Photo 9: The west scarp on bench 1, November 4, 2015. Looking west.

Photo 10: The west scarp on bench 1, November 11, 2015. Looking west.