

APPENDIX C-2
PUBLIC HEALTH RISK ASSESSMENT

**RMC PACIFIC MATERIALS, LLC. (CEMEX)
ELIOT QUARRY SMP-23 RECLAMATION PLAN AMENDMENT**

**PUBLIC HEALTH RISK ASSESSMENT
OF SITE RECLAMATION**

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1.0 INTRODUCTION

Compass Land Group (“Compass”) has prepared this Public Health Risk Assessment of Site Reclamation (“HRA”) in support of the RMC Pacific Materials, LLC. (“CEMEX”) Eliot Quarry SMP-23 Reclamation Plan Amendment Project in unincorporated Alameda County, California (“Project”). This HRA evaluates the potential air quality related public health risks associated with the proposed Project’s reclamation activities. Public health risks are compared against significance thresholds adopted by the Bay Area Air Quality Management District (“BAAQMD”). This HRA is intended to support the lead agency’s evaluation of air quality related public health impacts pursuant to the California Environmental Quality Act (“CEQA”).

The sections that follow provide a description of the Project, scope of the risk assessment, BAAQMD significance thresholds, exposure assessment, and risk analysis for use in Project CEQA review.

1.1 Project Description

Project Overview

CEMEX owns and operates the Eliot Quarry, a ±920-acre sand and gravel mining facility, located between the cities of Livermore and Pleasanton, at 1544 Stanley Boulevard in unincorporated Alameda County. See Figure 1, Project Location and Site Map. CEMEX and its predecessors-in-interest have been continuously mining for sand and gravel at the Eliot Quarry since at least 1906. In addition to mining and reclamation, existing permitted and accessory uses at the Eliot Quarry include aggregate, asphalt and ready-mix concrete processing, as well as ancillary uses such as aggregate stockpiling, load-out, sales, construction materials recycling, and equipment storage and maintenance. CEMEX’s mining operations at the site are vested per pre-1957 mining activities and Alameda County Quarry Permits Q-1 (1957), Q-4 (1957), and Q-76 (1969). Surface mining reclamation activities at the site are currently conducted pursuant to Surface Mining Permit and Reclamation Plan No. SMP-23 (“SMP-23”), approved in 1987. Reclamation plans are mandated by state law under the California Surface Mining and Reclamation Act (Cal. Public Resources Code Section 2710 et seq.). Thus, not implementing a reclamation plan at this site is not an option.

Under the Project, CEMEX proposes a revised Reclamation Plan that serves to adjust reclamation boundaries and contours, enhance drainage and water conveyance facilities, incorporate a pedestrian and bike trail, and achieve current surface mining reclamation standards. Reclamation activities will generally begin as mining activities cease in each area. However, the reduction in mining emissions has not been taken into account in this HRA consistent with guidance from the County. As discussed later in this report (e.g., at Section 5.2), reclamation emissions from the proposed Project are not considered new. The planned post-mining end uses are water management, open space, and agriculture (non-prime).

Consistent with prior approvals, the Project will develop Lake A and Lake B, which are the first two lakes in the Chain of Lakes pursuant to the Alameda County Specific Plan for Livermore-

Amador Valley Quarry Area Reclamation adopted in 1981 ("Specific Plan"). Upon reclamation, Lake A and Lake B, along with their appurtenant water conveyance facilities, will be dedicated to the Zone 7 Water Agency ("Zone 7") for purposes of water storage, conveyance and recharge management.

Lake A reclamation will include installation of a surface water diversion from the Arroyo del Valle ("ADV") to Lake A; conversion of a berm that crosses the west side of the lake to a small island to allow water to flow across the lake; installation of a water conveyance pipeline from Lake A to future Lake C (located off-site to the northwest); and an overflow outlet to allow water to flow back into ADV when Lake A water levels are high to prevent flooding in the localized area. The final surface area of Lake A will be 81 acres as compared to 208 acres in SMP-23. No further mining will occur in Lake A.

Lake B reclamation will include installation of a pipeline turn-out from Lake A, a water pipeline conduit to future Lake C, and an overflow outlet to allow water to flow back into ADV when Lake B water levels are high. The final bottom elevation of Lake B is proposed at 150 feet above mean sea level ("msl"), in order to maximize the available aggregate resource. The final surface area of Lake B will be 208 acres as compared to 243 acres in SMP-23.

To facilitate the southerly progression of Lake B, the Project includes realignment and restoration of a $\pm 5,800$ linear foot reach of the ADV. The proposed ADV realignment will result in an enhanced riparian corridor that flows around, rather than through (as currently anticipated in SMP-23), Lake B. The ADV realignment was contemplated in the Specific Plan and subject to environmental review in 1981.

Outside of Lake A and Lake B, reclamation treatment for other disturbed areas, including the Lake J excavation (not part of the Chain of Lakes), processing plant sites, and process water ponds will involve backfills and/or grading for a return to open space and/or agriculture. These areas are referred to as the North Areas for purposes of this study.

The Project is a modification of an approved reclamation plan project (i.e., SMP-23) for a vested mining operation. Except as outlined above, CEMEX proposes no change to any fundamental element of the existing operation (e.g., mining methods, processing operations, production levels, truck traffic, or hours of operation). A more complete description of the proposed Project is contained in CEMEX's Project Description, Revised Reclamation Plan, and other application materials provided to the County.

Project Reclamation Schedule

An estimated time schedule for Project reclamation construction activity is provided in Table 1, Anticipated Reclamation Schedule and Duration. This anticipated sequence and schedule is dependent upon many factors such as securing regulatory entitlements, fluctuations in market demands, and need for specific aggregate products. The reclamation finish (end) dates listed represent the anticipated date by which physical reclamation activity will be complete.

TABLE 1
ANTICIPATED RECLAMATION SCHEDULE AND DURATION

Area	Timing²	Est. Duration
1. Lake A		
a. Convert berm to island	2022	2 weeks
b. Berm between ADV and Lake A	2022	2 weeks
c. Overflow outlet to ADV	2022	1 week
d. Pipeline from Lake A to Lake C ²	2022	3 months
e. Diversion structure – ADV**	2023	2 months
f. Fill percolation ponds ⁵	2023	1 week
g. Revegetation	2023	1 month
2. Lake B		
a. Realigned Arroyo del Valle**	2022	7 months
b. Berm between ADV and Lake B	2022	2 weeks
c. Pedestrian and bike trail ³	2028	6 months
d. Conduit from Lake B to C	2031	1 week
e. Overflow outlet to ADV	2056	2 weeks
f. Excavate Shark's fin drainage notch	2056	1 week
g. Revegetation	2056	1 week
3. North Area - Silt Ponds, Plant Site, Lake J⁴		
a. Resoiling cap – main silt pond	2030	2 weeks
b. Revegetation – main silt pond	2030	1 week
a. Plant site removal	2056	3 months
a. Contour grading / resoiling	2056	1 month
b. Retention ponds	2056	2 weeks
c. Revegetation – plant site and Lake J	2056	3 weeks

Notes:

** Timing for these reclamation items contingent on obtaining regulatory agency authorizations (e.g., 404, 401, and 1600 authorizations).

1. Anticipated progression is approximate only. Actual timelines will vary depending on market and geologic conditions. The reclamation schedule assumes anticipated average mine production of 1,000,000 tons per year.
2. Pipeline from Lake A to Lake C includes turn-out into Lake B.
3. Pedestrian and bike trail south of the realigned ADV is assumed to be developed after an estimated five-year revegetation monitoring period for the realigned ADV.
4. The Lake J excavation will be repurposed as a silt pond after mining is complete (anticipated year 2030).
5. The percolation ponds have a clean, gravel substrate to promote water infiltration to ground. No products have been stored in the percolation ponds that would require any remediation or cleanup.

The reclamation activities listed in the table above would generally commence after mining is complete in each area. For the Lake A area, CEMEX is planning no further mining and plans to complete reclamation and dedicate the lake to Zone 7 as early as 2023. For the Lake B area, mining is ongoing and will continue for approximately 35 years pursuant to existing vested mining rights. In the near term, CEMEX plans to realign and restore the Lake B reach of the ADV as an item of concurrent reclamation to promote the southerly progression of mining in Lake B. The large gap in time between the early reclamation activities and final reclamation is because the installation of certain items of work, such as the overflow outlet, excavation of the drainage notch in the Shark's fin area, and revegetation would not occur until mining in the Lake B area is complete. Similarly for the North reclamation areas, final reclamation including plant site removal, contour grading, installation of retention ponds, and revegetation would not occur until mining is complete in both the Lake B and Lake J areas.

As part of final reclamation, all processing facilities (including the aggregate, asphaltic-concrete, and ready-mix concrete plants), conveyors, and truck scales will be dismantled and removed. Buildings (such as the office and shop buildings), fences and the road networks servicing the quarry may be left in place to facilitate the planned end uses of water management, open space and agriculture. Any incidental refuse or garbage will be collected, hauled off-site and disposed of in accordance with state and local standards. The Project *Air and Greenhouse Gas Emissions Study* (Compass, December 2019) and this HRA account for these processing plant removal activities.

The detailed locations for Project reclamation activities are included in the Revised Reclamation Plan and its supporting figures and design sheets submitted to Alameda County as part of the application.

Project Activities Associated with Public Health Risks

As described above, reclamation would occur in three areas (see Figure 1):

1. Lake A Area
2. Lake B Area
3. North Reclamation Area

Reclamation would occur in phases and sporadically over a period of approximately 34 years (2022 to 2056) as mining is completed in each area. During the reclamation period various activities such as grading, earthmoving, excavation, construction of pipelines, paving of a public trail, and re-vegetation would take place. Each of these activities has the potential to release fugitive dust as well as exhaust from various construction equipment, but in very limited time-frames and duration. Exposure to equipment exhaust and fugitive dust can lead to various health impacts. Specifically, the following three types of public health impacts are commonly associated with exposure to trace metals in dust and diesel particulate matter:

1. Cancer risk (reported as a probability)
2. Acute non-cancer risk (reported as a hazard index)

3. Chronic non-cancer risk (reported as a hazard index)

These health impacts are more thoroughly described in Section 1.3, below. The objective of this HRA is to determine if the Project is likely to expose nearby residents or workers to significant health risks that exceed applicable thresholds. The criteria used to determine if health risks are significant is discussed in Section 2.0, below.

1.2 Scope of the Risk Assessment

The preparation of health risk assessments is a three-step process. The first step is to identify potential contaminants that may contribute to public health risks. The second step is to assess the amount of contaminants that may reach the public (exposure assessment). The third and last step is to calculate the magnitude of the health risk as a result of exposure to harmful contaminants on the basis of the toxicology of the contaminants.

The Office of Environmental Health Hazard Assessment (“OEHHA”) and BAAQMD have provided guidance on the procedures that should be used for health risk assessments, including but not limited to the use of toxicological data for individual contaminants. While this HRA uses certain procedures and data from these Guidelines, this assessment is not intended to satisfy the reporting requirements under AB-2588 “Air Toxics” Hot Spots program. The latter requires a more detailed discussion of cancer burden, health values used in dosage-response and dosage estimates, etc. The Project is not subject to this program.

The procedures and assumptions used in this HRA were discussed ahead of time with staff at BAAQMD. To assist with the scoping of this HRA, Compass prepared an initial protocol for air dispersion modeling and health risk calculations (“Modeling Protocol”). The Modeling Protocol provided details on the emission rate calculations and how public health risks would be calculated. See Appendix A, Original Modeling Protocol. The Modeling Protocol suggested the use of San Joaquin Valley Air Pollution Control District (“SJVAPCD”) default emissions factors for metal content in fugitive dust for aggregate crushing operations due to a lack of site-specific information at the time relating to trace metals content in soils. After reviewing the protocol, BAAQMD directed Compass to conduct site-specific soil sampling to inform trace metal concentrations for use in the Project health risk modeling. Compass conducted soil sampling as discussed in Section 3.0 below and used the site-specific information in place of the SJVAPCD default factors. Other methods originally proposed in the modeling protocol (e.g., grid sizing) have also been updated. The modeling parameters used in this study are described in Section 4.0 below and supersede those that are found in the original Modeling Protocol.

1.3 Toxic Air Contaminants and Fine Particulate Matter

The following discussion of toxic air contaminants and fine particulate matter is sourced from the May 2017 *California Environmental Quality Act Air Quality Guidelines* issued by BAAQMD (“BAAQMD CEQA Guidelines”) to provide information and background on the primary constituents contributing to the Project health risks that are evaluated in this report.

1.3.1 Toxic Air Contaminants

Toxic air contaminants (“TACs”) are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A wide range of sources, from industrial plants to motor vehicles, emit TACs. TAC can be emitted directly and can also be formed in the atmosphere through reactions among different pollutants. This report will focus on direct TAC emissions that would be associated with Project reclamation activities, not those formed in the atmosphere.

The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis or genetic damage; or short-term acute effects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches. For evaluation purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure. Non-carcinogenic substances differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis. Acute and chronic exposure to non-carcinogens is expressed as a hazard index (HI), which is the ratio of expected exposure levels to an acceptable reference exposure level.

TACs are primarily regulated through State and local risk management programs. These programs are designed to eliminate, avoid, or minimize the risk of adverse health effects from exposures to TACs. A chemical becomes a regulated TAC in California based on designation by OEHHA. As part of its jurisdiction under Air Toxics Hot Spots Program (Health and Safety Code Section 44360(b)(2)), OEHHA derives cancer potencies and reference exposure levels (RELs) for individual air contaminants based on the current scientific knowledge that includes consideration of possible differential effects on the health of infants, children and other sensitive subpopulations, in accordance with the mandate of the Children’s Environmental Health Protection Act (Senate Bill 25, Escutia, Chapter 731, Statutes of 1999, Health and Safety Code Sections 39669.5 et seq.).

1.3.2 Fine Particulate Matter

PM_{2.5} is a fine particulate matter with a diameter equal to or less than 2.5 micrometers. PM_{2.5} is a complex mixture of substances that includes elements such as carbon and metals; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust and wood smoke. PM_{2.5} can be emitted directly and can also be formed in the atmosphere through reactions among different pollutants. This report will focus on direct PM_{2.5} emissions that would be associated with Project reclamation activities, not those formed in the atmosphere.

Compelling evidence suggests that PM_{2.5} is by far the most harmful air pollutant in the San Francisco Bay Area Air Basin (“SFBAAB”) in terms of the associated impact on public health (BAAQMD 2017). A large body of scientific evidence indicates that both long-term and short-term

exposure to PM_{2.5} can cause a wide range of health effects (e.g., aggravating asthma and bronchitis, causing visits to the hospital for respiratory and cardio-vascular symptoms, and contributing to heart attacks and deaths). BAAQMD recommends characterizing potential health effects from exposure to direct PM_{2.5} emissions through comparison to the applicable thresholds of significance. These thresholds are presented in Section 2.0, below.

1.3.3 Impacted Communities – Project Site Not Included

In the Bay Area, there are a number of urban or industrialized communities where the exposure to TACs is relatively high in comparison to others. These same communities are often faced with other environmental and socio-economic hardships that further stress their residents and result in poor health outcomes. To address community risk from air toxics, BAAQMD initiated the Community Air Risk Evaluation (“CARE”) program in 2004 to identify locations with high levels of risk from TACs co-located with sensitive populations and use the information to help focus mitigation measures. Through the CARE program, BAAQMD developed an inventory of TAC emissions for 2005 and compiled demographic and health indicator data. According to the findings of the CARE Program, diesel particulate matter, mostly from on and off-road mobile sources, accounts for over 80 percent of the inhalation cancer risk from TACs in the Bay Area. Impacted communities as of November 2009 include the urban core areas of Concord, eastern San Francisco, western Alameda County, Redwood City/East Palo Alto, Richmond/San Pablo, and San Jose. The Project site is not located in one of these impacted communities.

1.4 Report Organization

This report is divided into seven sections along with supporting figures and appendices. Following this introduction, Section 2.0 describes the applicable significance criteria that the lead agency may use for the evaluation of Project health risks pursuant to CEQA. Section 3.0 discusses the peak hourly and annual averaged emissions and site-specific soil constituents associated with the Project. Section 4.0 describes the methods used for the exposure assessment, including the data and tools used to determine the dispersion pattern of emissions from the Project. This analysis considers the location of nearby homes, local wind patterns and topography. Section 5.0 describes the results of the Project risk assessment. Section 6.0 summarizes the results and the risk assessment findings relative to applicable thresholds of significance. Section 7.0 provides technical references. Technical data and calculations are provided in figures and appendices.

2.0 SIGNIFICANCE CRITERIA

This section describes the criteria that are used in this report to assess the significance of public health risks. These criteria are based on the May 2017 *California Environmental Quality Act Air Quality Guidelines* issued by BAAQMD (“BAAQMD CEQA Guidelines”). The BAAQMD CEQA Guidelines inform the public and lead agencies of the extent of airborne emissions from stationary sources and the potential public health impacts associated with such emissions.

To assist lead agencies in evaluating air quality impacts at the neighborhood scale, BAAQMD recommends thresholds of significance for local community risks and hazards associated with

TACs and PM_{2.5} with respect to siting a new source and/or receptor; as well as for assessing both individual source and cumulative multiple source impacts. Local community risk and hazard impacts are associated with TACs and PM_{2.5} because emissions of these pollutants can have significant health impacts at the local level. If emissions of TACs or PM_{2.5} exceed any of the thresholds of significance listed below, a proposed project would result in a significant impact:

1. Non-compliance with a qualified risk reduction plan; or
2. An excess cancer risk level of more than 10 in one million, or a non-cancer (i.e., chronic or acute) hazard index greater than 1.0 would be a cumulatively considerable contribution; or
3. An incremental increase of greater than 0.3 micrograms per cubic meter (µg/m³) annual average PM_{2.5} would be a cumulatively considerable contribution.

A project would have a cumulatively considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000 foot radius from the fence line of a source plus the contribution from the project, exceeds the following:

1. Non-compliance with a qualified risk reduction plan; or
2. An excess cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all local sources) greater than 10.0; or
3. 0.8 µg/m³ annual average PM_{2.5}.

These thresholds for local risks and hazards associated with TACs and PM_{2.5} are intended to apply to both permitted stationary sources and on- and off-road mobile sources, such as sources related to construction, busy roadways, or freight movement. While the Project does not introduce a new stationary source, the modeled Project health risks involve on- and off-road mobile sources that can be compared to the BAAQMD thresholds for purposes of CEQA analysis.

3.0 EMISSIONS SUMMARY

Project reclamation activities would release a variety of TACs, such as diesel particulate matter (“DPM”) and fugitive dust containing trace metals and respirable silica for brief periods of construction-related work. These are not prolonged exposures lasting many years.

A summary of emissions is presented in Appendix B, Modeling Emissions Inputs. DPM emissions are based on the number, type and duration of usage of construction equipment. Table 1 in Appendix B presents a breakdown of DPM by year and annual average DPM emissions. These emissions were sourced from the Project *Air and Greenhouse Gas Emissions Study* (Compass, December 2019), which relied primarily on the CalEEMod model to quantify emissions associated with reclamation activities. Project reclamation activities were modeled as independent phases in CalEEMod for each of the Lake A, Lake B, and North Areas. The phases were then combined to calculate total Project emissions.

Site-specific soil samples were collected at each of the three reclamation areas (i.e., Lake A, Lake B, and North reclamation areas) to inform emission rates for respirable silica and trace metals. No heavy metals or toxic compounds have been stored at Lakes A or B. The same is true for the North reclamation areas, except for fuels, oils and lubricants that are used for heavy equipment fueling and maintenance and aggregate processing operations. To identify trace concentrations of metals and respirable silica in soils, three soil samples were collected for each of the three reclamation areas, for a total of nine samples. Soil samples were conducted in accordance with the EPA operating procedures for soil sampling (i.e., SESDPROC-300-R3, adopted August 21, 2014) and field equipment cleaning and decontamination (i.e., SESDPROC-205-R3, adopted December 18, 2015). Samples were delivered with chain of custody to McCampbell Analytical, Inc. for analysis. Samples were analyzed by McCampbell to determine the respirable fraction of silica and trace metals concentrations. McCampbell's laboratory reports are included in Appendix C, Soils Analysis Laboratory Results.

Laboratory results were averaged for each of the three reclamation areas to determine annual and daily emission rates. This data along with annual and daily emission rates of PM₁₀ were used to quantify annual and hourly emission rates of respirable silica and trace metals. Calculations are provided in Tables 2 through 5 of Appendix B.

The emission rate for respirable silica used in this study is calculated by multiplying the respirable silica percentage (based on the site-specific soil samples) by the PM₁₀ emissions rate. The respirable silica percentage is calculated by multiplying the laboratory reported percentage weight of silica quartz in a bulk sample by a factor of 0.44 (44%) to account for the estimated respirable fraction. The respirable factor of 0.44 is based on an aggregate industry study titled, *PM₄ Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California* (Richards et al., November 2009), published in the Journal of the Air & Waste Management Association, Vol. 59, which found that the concentration of crystalline silica in respirable PM averaged 44% of the crystalline silica content of the bulk mineral.

The annual emission rate of metals in pounds is calculated by multiplying the laboratory reported average concentration for each metal (in mg/Kg, aka parts per million by weight) by the annual PM₁₀ emission rate (in tons) by 2,000 (to convert from tons to pounds) and then dividing by 1,000,000 (see Table 3 of Appendix B). The hourly emission rate of metals in pounds is calculated by multiplying the laboratory reported average concentration for each metal (in mg/Kg or ppm) by the maximum daily PM₁₀ emission rate (in pounds per day) and then dividing by 1,000,000, and then dividing again by 8 to convert from pounds per day to pounds per hour.

To address a request by the County's peer reviewer, hexavalent chromium ("Cr-VI") is accounted for in this revised risk analysis. However, based on the site-specific soil sampling the fraction of hexavalent chromium ("Cr-VI") in soils that would be disturbed during reclamation is essentially de minimis. Of the nine site-specific (9) samples that were analyzed, only one sample detected Cr-VI at a level that is above the laboratory detection limit of 0.2 mg/Kg (ppm). The reported value for the single sample for the Lake B Arroyo del Valle berm area is 0.24 mg/Kg, which is just above the detection limit of 0.2 mg/Kg. Please refer to Appendix C at pp. 13-15 for the analytical

results for Cr-VI (non-detect for all but the one noted sample), which was then compared to the analytical results for total chromium at pp. 16-24. based on the site-specific sampling, the computed emission rate for Cr-VI in the Lake B area is only 4.99×10^{-5} pounds per year, which corresponds to a 0.193% fraction of the total chromium found in the Lake B area soils. Compass' calculation for the annual emission rate of Cr-VI at Lake B (the only location where Cr-VI was detected) is presented below. For Lake B, the Cr-VI emission rate used for purposes of modeling is based on the average concentration of the three Lake B samples assuming one-half the detection limit (or 0.10 mg/Kg) for the two non-detect samples in the mining and TopCon areas. While Cr-VI is accounted for in the modeling, it does not meaningfully change the results of the risk assessment due to the very low level found in only one sample on the site.

			Assume 0 Concentration if Not Detected		Assume 1/2 of detection limit if Not Detected	
	Lake B Lab Analysis	Pit	0	mg/Kg	0.10	1/2 Det Limit
		TopCon	0	mg/Kg	0.10	1/2 Det Limit
		Adv Berm	0.24	mg/Kg	0.24	
	Aver Concentration of Cr+6		0.08	mg/Kg	0.147	
	Annual PM-10 Emission Rate (From Table 3)		0.17		0.17	tons/yr
			340		340	lbs/yr
	Cr+6 Emission Rate (e.g., $0.08 \times 340 / 1,000,000$)		2.72E-05		4.99E-05	lbs/yr
	Total Cr Emission Rate		2.58E-02		2.58E-02	lbs/yr
	Ratio Cr+6/Cr		1.05E-03		1.93E-03	
	% Cr+6 as fraction of total Cr		0.105%		0.193%	

4.0 METHODS FOR EVALUATING EXPOSURE

Exposure assessment involves translating the emission rate (e.g., lbs/hr) of individual TACs (presented in Tables 1 to 5 of Appendix B) into a concentration (e.g., grams/cubic meter or parts per million) of each TAC. The key step in performing an exposure assessment is the application of an air dispersion model. The dispersion model incorporates the local meteorological data (wind speed, wind direction, local temperature, inversion heights, etc.), stack height, and exhaust flow characteristics into the concentration of individual air contaminant.

Dispersion modeling was performed using the latest version of the AERMOD Modeling System version 19121. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. AERMOD, like most dispersion models, uses mathematical formulations to characterize the atmospheric processes that disperse pollutants emitted by a source. Using source emission rates, exhaust parameters, terrain characteristics, and meteorological inputs, AERMOD calculates down-wind pollutant concentrations at specified receptor locations. AERMOD is recommended by both the EPA and BAAQMD for stationary source air dispersion modeling.

4.1 Model Setup and Options

The EPA and BAAQMD recommended AERMOD dispersion model was employed in the current exposure assessment. Model selection parameters are listed in Table 2, below.

4.2 Modeling Grid

Two modeling grids were used. Grid 1 provides an overall distribution of risk. A second, smaller grid provides a more detailed calculation of risk. The first grid covers an area 5,880 meters x 4,620 meters and uses a 140-meter spacing. This grid consists of 1,764 individual locations. The second grid covers an area 3,750 meters x 3,250 meters. The second grid is divided into 50-meter cells for a total of 4,875 individual receptors in the vicinity of the Project. In addition, discrete receptors were located at nearby homes, school and hospital. The maximum risk at discrete receptors does not depend on the choice of grid. See Figure 2, Modeling Grid. The final grid employed was larger than what had been proposed in the original Modeling Protocol (Appendix A). The expanded grid was selected to provide additional coverage to the east of the site.

4.3 Meteorological Data

Five years of meteorological data was used in the exposure assessment. The surface data (wind speed, wind direction, temperature, etc.) were recorded at Livermore airport for the period January 1, 2009 to December 31, 2013. This is the most recent data available from the California Air Resources Board ("CARB"). Figure 3, Distribution of Winds, shows the overall wind patterns based on the five years of hourly wind data. This figure shows that the winds are predominantly from the northwest with an average annual speed of 5.5 knots. Calm winds occur approximately 31% of the time.

In addition to surface meteorological data, hourly inversion height data were also required. Five years of data from the nearest upper air station (Oakland Airport, CA) were used to develop hourly inversion heights.

TABLE 2
MODEL SELECTION AND PARAMETERS

Category	Selection / Parameter	Notes
Pollutants Modeled	1. Toxic Metals in fugitive dust 2. Diesel Particulate Matter (DPM)	Annual, 1-Hour concentrations were calculated at each receptor.
Model Selection	AERMOD Version 19121	Industry standard.
Emission Sources and Source Geometry	<p>Various diesel fueled construction equipment and fugitive dust emissions from material handling, excavation, site work, etc.</p> <p>Emissions are modeled as single, elevated (5-meter height) area sources for each of the three reclamation areas.</p> <p>For TACs, a unit emission rate (1 gram/sec) is assigned to each of the three area sources.</p> <p>For PM_{2.5}, the annual emission rates of PM₁₀ for Lake A and Lake B are divided by the area and results are input in terms of grams/square meter per second. See detailed calculation in Appendix F.</p>	<p>Emission rates of DPM and fugitive dust were determined using the CalEEMod model.</p> <p>The emission rates of metals were calculated from metal composition of fugitive dust based on site specific soil samples. Three samples were collected from each of the three sites, for a total of nine samples.</p>
Modeling Grid(s)	<p>Grid 1: 5,880 meters x 4,620 meters with a 140-meter spacing</p> <p>Grid 2: 3,750 meters x 3,250 meters with a 50-meter spacing</p>	See Figure 2.
Sensitive Receptors	1. Nearest Residences 2. Schools and hospitals	See Figure 2 showing location of nearby residences.
Meteorological Data	1. 5 years of data 2009 to 2013 from Livermore Airport 2. Upper Air Data from Oakland Airport 3. Base elevation of 110.58 meters	The meteorological data was obtained from CARB.
Model Options	<p>The following options were used</p> <ul style="list-style-type: none"> - Non-Regulatory Option to Allow use of U-Star adjusted met data - Terrain option (option used) 	

5.0 RISK ANALYSIS

Health risks from public exposure to various TACs is discussed in this section. The emission rates of various TACs referenced in Section 3.0 are used as a basis to quantify various health risks. The HARP2 risk model developed by the CARB and OEHHA¹ was used to calculate the health risks. As described in Section 1.0, three types of health risks were calculated (cancer, chronic non-cancer and acute non-cancer).

5.1 Project Risk Analysis

The project's risks were evaluated using the HARP2 risk model using the OEHHA Derived calculation method. Residential cancer risk is based on a 30-year exposure and worker cancer risk is based on a 25-year exposure consistent with BAAQMD and OEHHA guidelines. For cancer and chronic risks, the minimum mandatory exposure pathways were selected. For acute risks, inhalation pathway was selected.

Since the project is surrounded by an urban residential area, exposure pathways such as home grown produce, raising of animals (cows, pigs, chickens, etc.) for food were not considered. In addition, the area is served by municipal water supply via underground utilities. Therefore, drinking water would not be impacted from any emissions from the project.

The Project's incremental maximum cancer risk at nearby homes is estimated to be 0.8 cancers per million. The risk varies from approximately 0.8 to less than 0.1 excess cancers per million depending on the exposure scenario (residential or sensitive receptor) and location. Cancer risk at nearby businesses is estimated to be 0.03 cancers per million. These results are presented in terms of a probability (cancers risk per million). The spatial distribution of residential and worker cancer risk is shown on Figures 4 and 7, respectively.

The highest residential risk levels are along Vetta Drive, east of Isabel Avenue and north of Lake A in the vicinity of the future construction of the Lake A to C water conveyance pipeline. See Figure 5, Location of Maximum Residential Cancer Risk. Risk at nearby schools and hospitals are estimated to be below 0.04 cancers per million. The highest worker risk occurs southwest of the intersection of Isabel Avenue and East Vineyard Avenue.

The maximum non-cancer risks at nearby homes and businesses are calculated in terms of a hazard index ("HI"). The spatial distribution of acute hazard index is shown on Figure 6. Chronic hazard index was below 0.002 at all locations and as a result a contour map could not be created. The risks for both residential and worker locations are summarized in Table 3.

Excerpts of the HARP2 model inputs are included in Appendix D. HARP model risk tables showing the calculated health risks (including cancer risk and hazard indices) are provided in Appendix E.

¹ OEHHA Hotspots Analysis and Reporting Program (HARP) available at:
<https://ww3.arb.ca.gov/toxics/harp/harp.htm>

5.2 Project Annual Average PM_{2.5} Concentrations

AERMOD is used to model the Project's incremental annual average PM_{2.5} concentration. The emission rate input into AERMOD is in terms of grams per second per square meter. The highest annual emissions occur during year 2022. During that year, 0.09 tons and 0.28 tons of PM_{2.5} are released from Lake A and B areas, respectively. No reclamation-related emissions from the North Area are expected in 2022.

The Project's incremental annual average PM_{2.5} concentration is 0.26 micrograms per cubic meter (µg/m³), which is less than the applicable threshold of greater than 0.3 µg/m³. Inputs and excerpts of the PM_{2.5} modeling are provided in Appendix F. In addition, impacts associated with PM_{2.5} emissions were previously evaluated in the Project *Air and Greenhouse Gas Emissions Study* (Compass, December 2019). Compass' study demonstrated that impacts from PM_{2.5} were less than significant.

5.3 Cumulative Impacts Resulting from TAC and PM_{2.5} Emissions

The BAAQMD establishes CEQA thresholds of significance for local community and risk hazard impacts for new sources that result in an increase in daily or annual emission levels of any TAC. Current cumulative conditions at the site include on-going mining operations, an approved reclamation plan (SMP-23), and associated TAC and PM_{2.5} emissions. Mining activities, and emissions associated with mining, will generally cease in each area when the majority of reclamation activities begin. As a result, the cumulative TAC and PM_{2.5} emissions in the Project area will be significantly reduced when mining ends and reclamation begins in each area. In addition, State and local law mandate the reclamation of surface mining operations, so reclamation must occur under the approved reclamation plan if the reclamation plan amendments are not approved. Therefore, reclamation emissions from the proposed Project are not considered new. The Project will not have a cumulatively considerable contribution to TAC and PM_{2.5} emissions, as the Project involves amendments to an existing reclamation plan, and these proposed amendments do not implicate an increase in TACs or PM_{2.5} above baseline conditions. Thus, the cumulative impacts related to TAC and PM_{2.5} emissions are less-than-significant.

6.0 RESULTS AND CONCLUSIONS

Table 3 below summarizes the Project health risks in comparison to BAAQMD significance thresholds. The Project's potential health risk impact in terms of excess cancer risk, non-cancer hazards, and maximum incremental annual average PM_{2.5} concentrations is **less than significant**.

The risk assessment process contains numerous, conservative assumptions to ensure that public health risks are not underestimated. These assumptions are related to the exposure duration, toxicity data and use of Gaussian type statistical atmospheric dispersion models. For example, it is unlikely that any individual would remain in the same location for 30 years. As a result, these modeling assumptions may overstate the Project's contribution and the public's exposure to health risks.

TABLE 3
SUMMARY OF MAXIMUM LONG-TERM HEALTH RISKS AT THE PROJECT AREA

Risk Metric	Maximum Off-Site Value	Significance Threshold	Significant?
Residential Cancer Risk per Million (30-year exposure)	0.769	10	No
Worker Cancer Risk (25-year exposure)	0.027	10	No
Cancer Risk per Million at Sensitive Receptors (schools, hospitals)	0.039 at Granada High School 0.029 at Stanford Valley Health Center	10	No
Chronic Hazard Index	Residential 0.0019 Worker 0.0012	1.0	No
Acute Hazard Index	Residential 0.065 Worker 0.028	1.0	No
Annual PM _{2.5}	0.26 ug/m3	> 0.3 ug/m3	No

Recommendations for air quality related best management practices for Project construction activities were included in the Air Quality and Greenhouse Gas Emissions Study (Compass, December 2019).

7.0 REFERENCES

BAAQMD (2017). California Environmental Quality Act Air Quality Guidelines. May 2017.

CalEPA (2012). Technical Support Document for Exposure Assessment and Stochastic Analysis. Office of Environmental Health Hazard Assessment. California Environmental Protection Agency. August 2012.

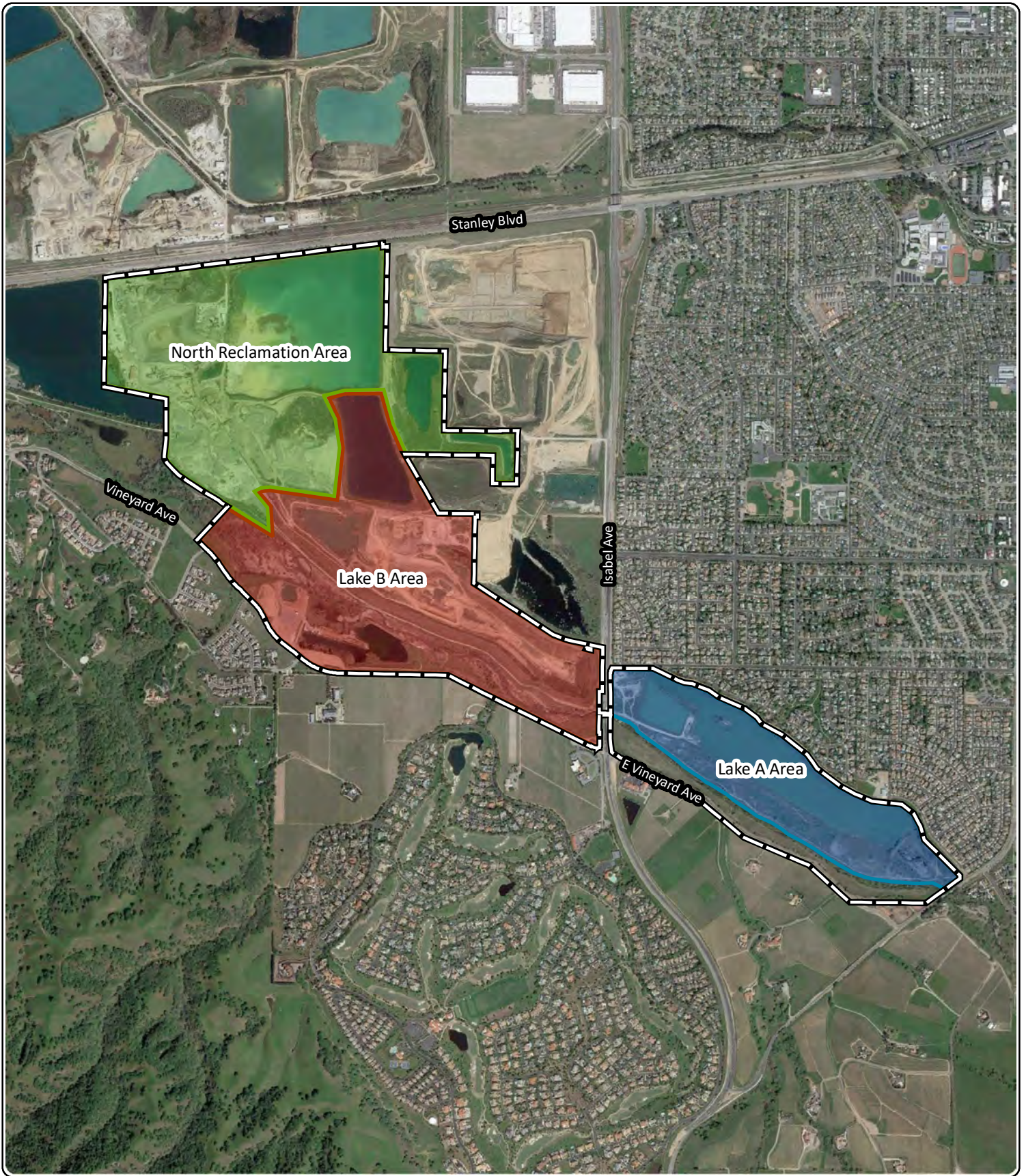
CARB (2003). HARP User's Guide. Available at: <http://www.arb.ca.gov/toxics/harp/harp.htm>. December 2003.

Compass Land Group (2019). Air and Greenhouse Gas Emissions Study. December 2019 (Revised).

EPA (2004). User's Guide for the AMS/EPA Regulatory Model – AERMOD. EPA Document No. EPA=454/B-03-001. September 2004.





OEHHA (2014). Consolidated Table of Approved health Risk Values. Cal EPA, Office of Environmental Health Hazard Assessment. July 3, 2014.

Richards et al. (2009). PM₄ Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California. Journal of the Air & Waste Management Association, Vol. 59. November 2009.



Aerial photo adapted from Google Earth Maps Imagery Date 6/28/2018.

Legend:

-  Reclamation Plan Boundary
-  North Reclamation Area
-  Lake B Area
-  Lake A Area

0 0.25 0.5 Miles



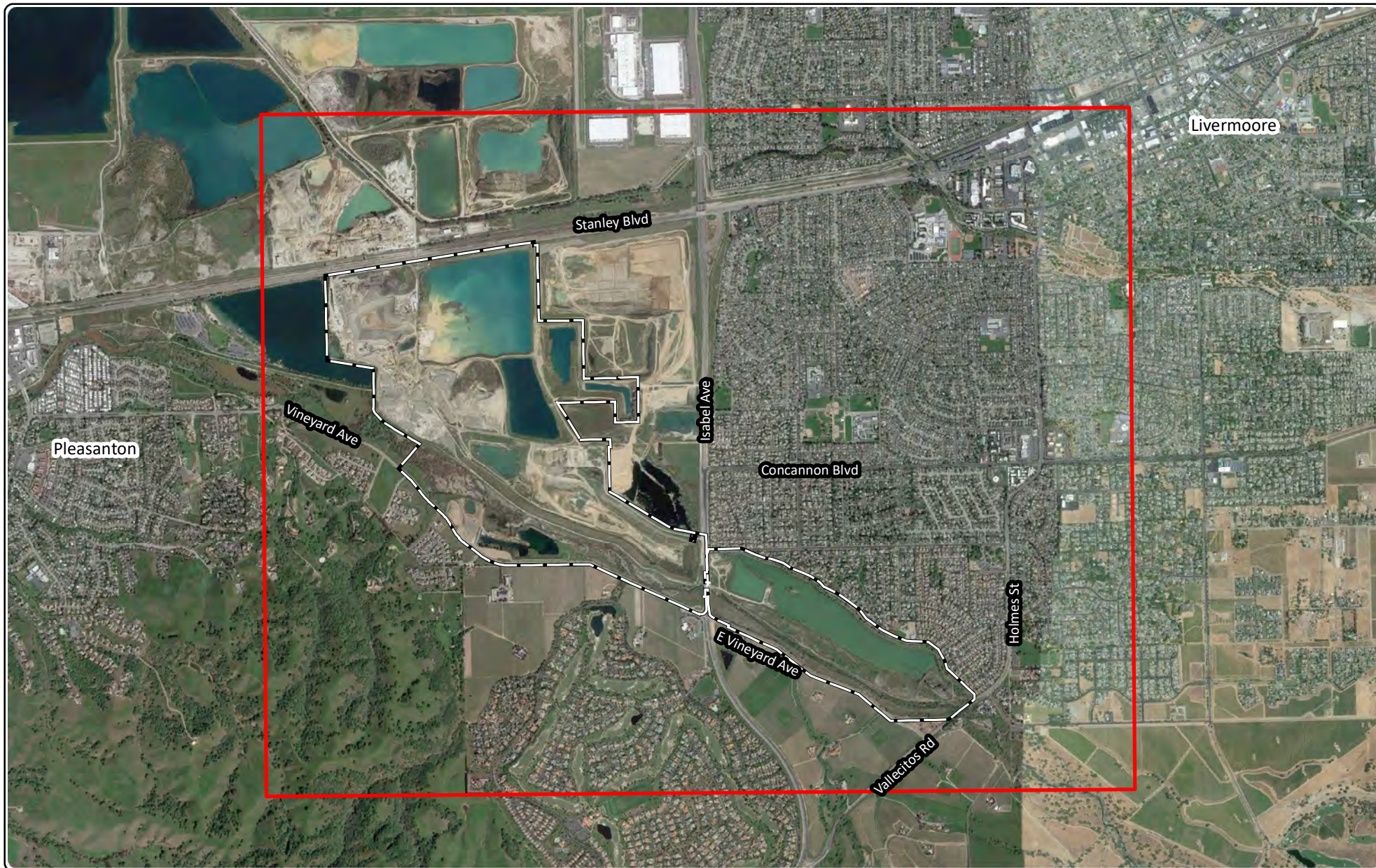
Project Location and Site Map
Eliot Quarry - SMP 23
CEMEX Construction Materials Pacific, LLC.
Alameda County, California

Figure 1

6/17/2020

Disclaimer: The data was mapped for planning purposes only. No liability is assumed for accuracy of the data shown.

COMPASS LAND
GROUP



Aerial photo adapted from Google Earth Imagery dated 4/3/2018.

Legend:

- Modeling Grid
- Project/Plan Boundary

0 0.5 1 Miles



Modeling Grid
Eliot Quarry - SMP 23
CEMEX Construction Materials Pacific, LLC.
Alameda County, California

Figure 2

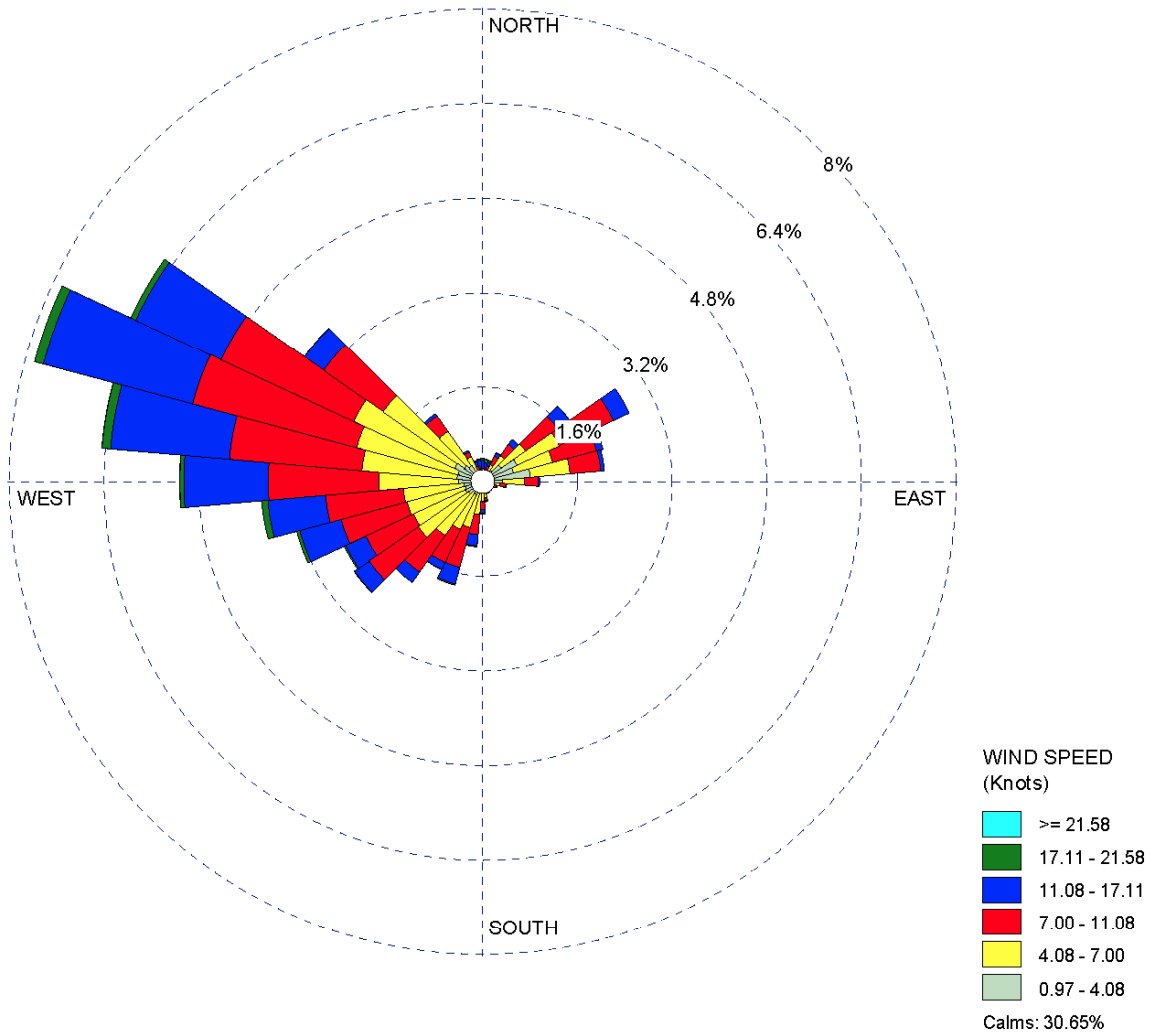
6/17/2020

Disclaimer: The data was mapped for planning purposes only. No liability is assumed for accuracy of the data shown.

COMPASS LAND
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WIND ROSE PLOT:
Station #23285

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:

DATA PERIOD:

Start Date: 1/1/2009 - 00:00
End Date: 1/2/2014 - 23:59

COMPANY NAME:

MODELER:

CALM WINDS:

30.65%

TOTAL COUNT:

42342 hrs.

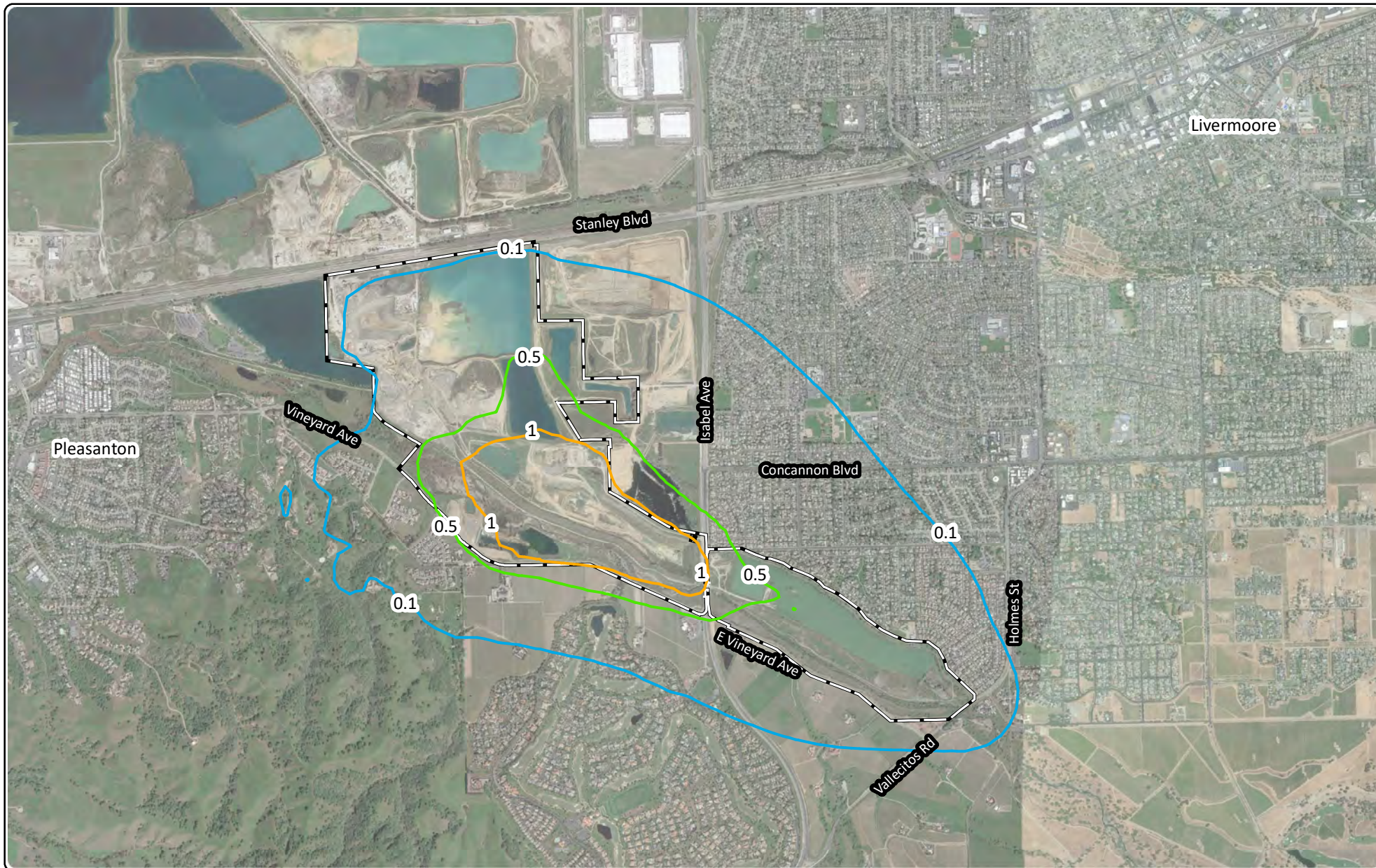
AVG. WIND SPEED:

5.49 Knots

DATE:

3/9/2020

PROJECT NO.:



Aerial photo adapted from Google Earth Imagery dated 4/3/2018.

Legend:

Project/Plan Boundary

Cancer Risk:

1.0 per million

0.5 per million

0.1 per million

0 0.5 1 Miles



Spatial Distribution of 30 Year Residential Cancer Risk
Eliot Quarry - SMP 23
CEMEX Construction Materials Pacific, LLC.
Alameda County, California

Figure 4

6/17/2020

Disclaimer: The data was mapped for planning purposes only. No liability is assumed for accuracy of the data shown.

COMPASS LAND
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Aerial photo adapted from Google Earth Imagery dated 4/3/2018.

Legend:



Project/Plan Boundary

Cancer Risk:

— 1.0 per million

— 0.5 per million

0 150 300 Feet



Location of Maximum Residential Cancer Risk
 Eliot Quarry - SMP 23
 CEMEX Construction Materials Pacific, LLC.
 Alameda County, California

Figure 5

6/17/2020


Disclaimer: The data was mapped for planning purposes only. No liability is assumed for accuracy of the data shown.

COMPASS LAND
 GROUP




Aerial photo adapted from Google Earth Imagery dated 4/3/2018.

Legend:

 Project/Plan Boundary

Acute Hazard Index

 0.05

0 2,000 4,000 Feet



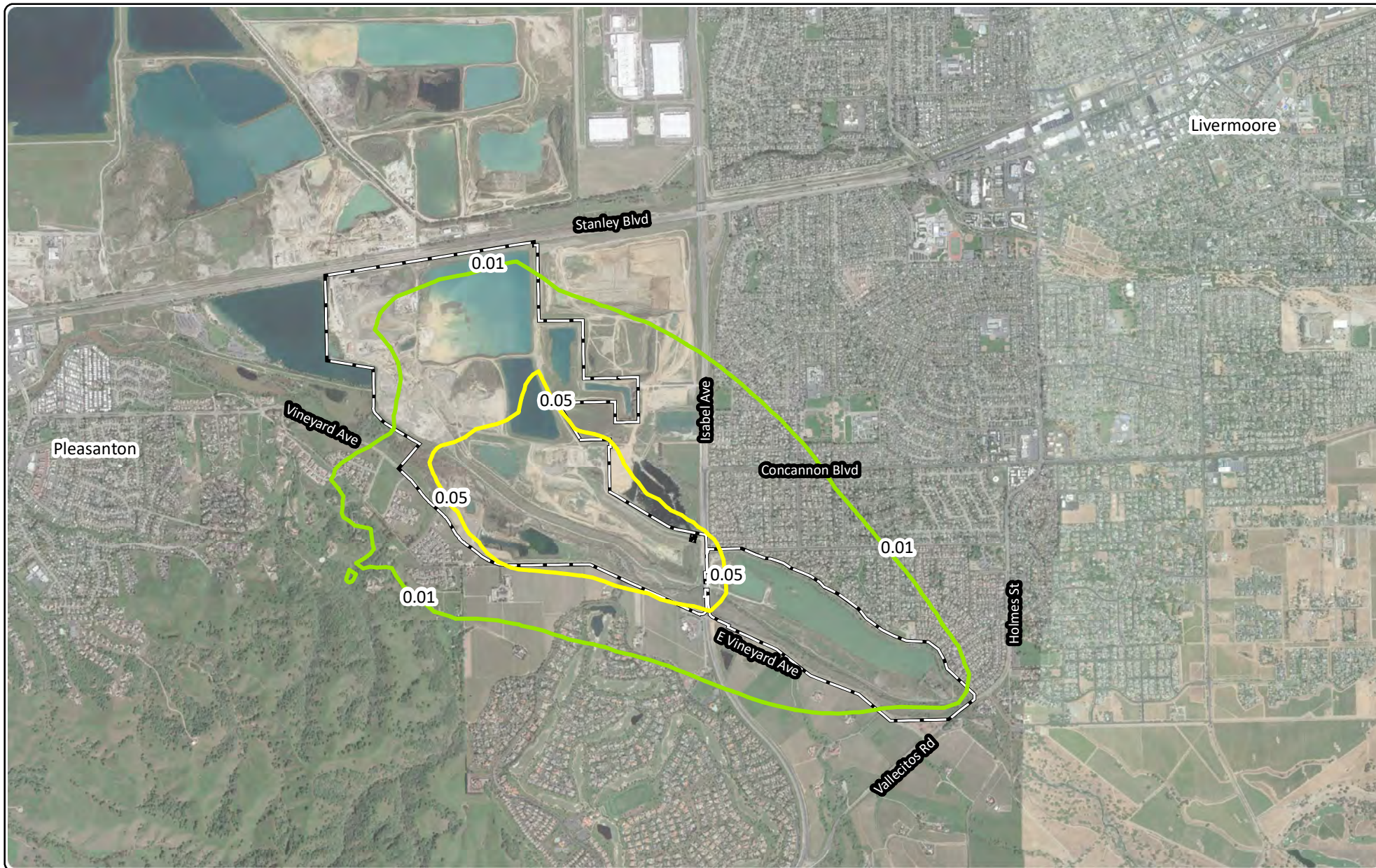
Spatial Distribution of Acute Hazard Index
Eliot Quarry - SMP 23
CEMEX Construction Materials Pacific, LLC.
Alameda County, California

Figure 6

6/17/2020

Disclaimer: The data was mapped for planning purposes only. No liability is assumed for accuracy of the data shown.

COMPASS LAND
GROUP



Aerial photo adapted from Google Earth Imagery dated 4/3/2018.

Legend:



Project/Plan Boundary

Cancer Risk:

0.05 per million

0.01 per million

0 0.5 1 Miles



Worker Cancer Risk
Eliot Quarry - SMP 23
CEMEX Construction Materials Pacific, LLC.
Alameda County, California

Figure 7

6/17/2020

Disclaimer: The data was mapped for planning purposes only. No liability is assumed for accuracy of the data shown.

COMPASS LAND
GROUP

Protocol for Air Dispersion Modeling and Health Risk Calculations

Reclamation Activities

Eliot Quarry SMP-23 Reclamation Plan Amendment Project

INTRODUCTION

CEMEX Construction Materials Pacific, LLC. ("CEMEX") owns and operates the Eliot Quarry, a ±920-acre sand and gravel mining facility, located between the cities of Livermore and Pleasanton, at 1544 Stanley Boulevard in unincorporated Alameda County. Under the Eliot Quarry SMP-23 Reclamation Plan Amendment Project ("Project"), CEMEX is seeking Alameda County approval of a Revised Reclamation Plan that serves to adjust reclamation boundaries and contours, enhance drainage and water conveyance facilities, incorporate a pedestrian and bike trail, and achieve current surface mining reclamation standards. Pending Project approval, CEMEX plans to carry out reclamation activities in a phased manner over approximately 30 years in the following three areas:

1. Lake A Area
2. Lake B Area
3. North Reclamation Areas

These three areas are shown in the attached Figure 1.

Specific activities are summarized below:

Description	Timing	Duration
Lake A Area		
a. Excavation to convert a berm near the west side of the lake to an island	2022	~2 weeks
b. Installation of a berm along the Arroyo del Valle (creek)	2022	~2 weeks
c. Installation of an overflow outlet atop the berm to be installed along the Arroyo del Valle	2022	~1 week
d. Installation of a water conveyance pipelines from Lake A to Lakes B and C (Lake C is located off of CEMEX property and pipe will be capped at CEMEX property line)	2022	~3 months
e. Installation of a diversion structure to move water from the Arroyo del Valle into Lake A	2023	~2 months
f. Fill percolation ponds	2023	~1 week
g. Revegetation	2023	~1 month
Lake B Area		
a. Realignment of a ~5,800 linear foot reach of the Arroyo del Valle	2022	~7 months
b. Installation of a berm along the Arroyo del Valle	2022	~2 weeks
c. Installation of a pedestrian and bike trail on the south side of the realigned Arroyo del Valle along Vineyard Avenue	2028	~6 months

Description	Timing	Duration
d. Installation of a water conveyance conduit between Lakes B and C (Lake C is located off of CEMEX property and pipe will be capped at CEMEX property line)	2031	~1 week
e. Installation of an overflow outlet atop the berm to be installed along the Arroyo del Valle	2056	~2 weeks
f. Excavation to create a drainage notch in an existing embankment referred to as the "Shark's fin"	2056	~1 week
g. Revegetation	2056	~1 week
North Reclamation Areas		
a. Place soil cap over the main silt pond	2030	~2 weeks
b. Removal of processing plants	2056	~3 months
c. Grading of plant site and Lake J areas (the Lake J mining area will be backfilled as a component of mining operations and will require minor grading at final reclamation to prepare the area for a return to open space and/or agriculture)	2056	~1 month
d. Installation of retention ponds for post-reclamation stormwater management	2056	~2 weeks
e. Revegetation	2056	~3 weeks

A health risk assessment (HRA), including atmospheric dispersion modeling will be conducted to determine public health risks associated with the reclamation activities. Prior to commencing the HRA, this protocol has been prepared to document the proposed methodology and assumptions. This protocol is being submitted to the BAAQMD for their review and comments prior to commencing the HRA.

Dispersion Modeling

Modeling Element	Content	Comments
Pollutants Modeled	Toxic Metals in fugitive dust Diesel Particulate Matter (DPM)	Annual, 1-Hour concentrations will be calculated at each receptor
Model Selection	AERMOD Version 19121	
Emission Sources and Source Geometry	Various diesel fueled construction equipment and fugitive dust emissions from material handling, excavation, site work, etc. Emissions would be modeled as single areas sources for each of the three reclamation areas	Emission rates of DPM from equipment will be determined using the OFFROAD emissions model and CARB recommended load factors. Emissions of PM-10 will be considered the same as emissions of DPM. Emissions of fugitive dust will be calculated per emission factors in AP-42 for site activities.

		The emission rates of metals will be calculated from metal composition of fugitive dust per guidance from SJVAPCD. Copy of the recommended metal content is shown in Figure 2.
Modeling Grid	5,500 meters x 4,300 meters with a 50 meter spacing	See Figure 3
Sensitive Receptors	Nearest Residences. All schools, hospitals and day care centers within 3 kilometers of project site	See Figure 3 showing location of nearby residences
Meteorological Data	5 years of U-Star Adjusted 2014 to 2018 from Livermore Upper Air Data from Oakland	The meteorological data will be requested from BAAQMD
Model Options	The following options will be Used <ul style="list-style-type: none"> - Non-Regulatory Option to Allow use of U-Star adjusted met data - Terrain option 	

Risk Calculation

Risk Calculation	Content	Comments
Toxic Pollutants Modeled	Diesel Particulate Matter (DPM) Trace Metals (in fugitive dust)	Assume emissions occur 10 hours/day between 7 am and 5 pm, 6 days/week. Construction duration assumed for modeling will vary by task.
Calculation of Annual Emission Rates	Emission Rates for 30 Years Divided by 30 Years	
Risk Calculated	Residential and Worker Cancer Risk per Million, Acute and Chronic Hazard Index	
Calculation Methodology	Use HARP2 Risk model to Calculate 30 year cancer risk 1-Hour Acute Hazard Index Chronic Hazard Index	Use the most current ADMRT Dispersion Modeling and Risk Tool Version 19121. This tool incorporates the current OEHHA Guidelines for exposure and toxicity of various compounds

Figure 1

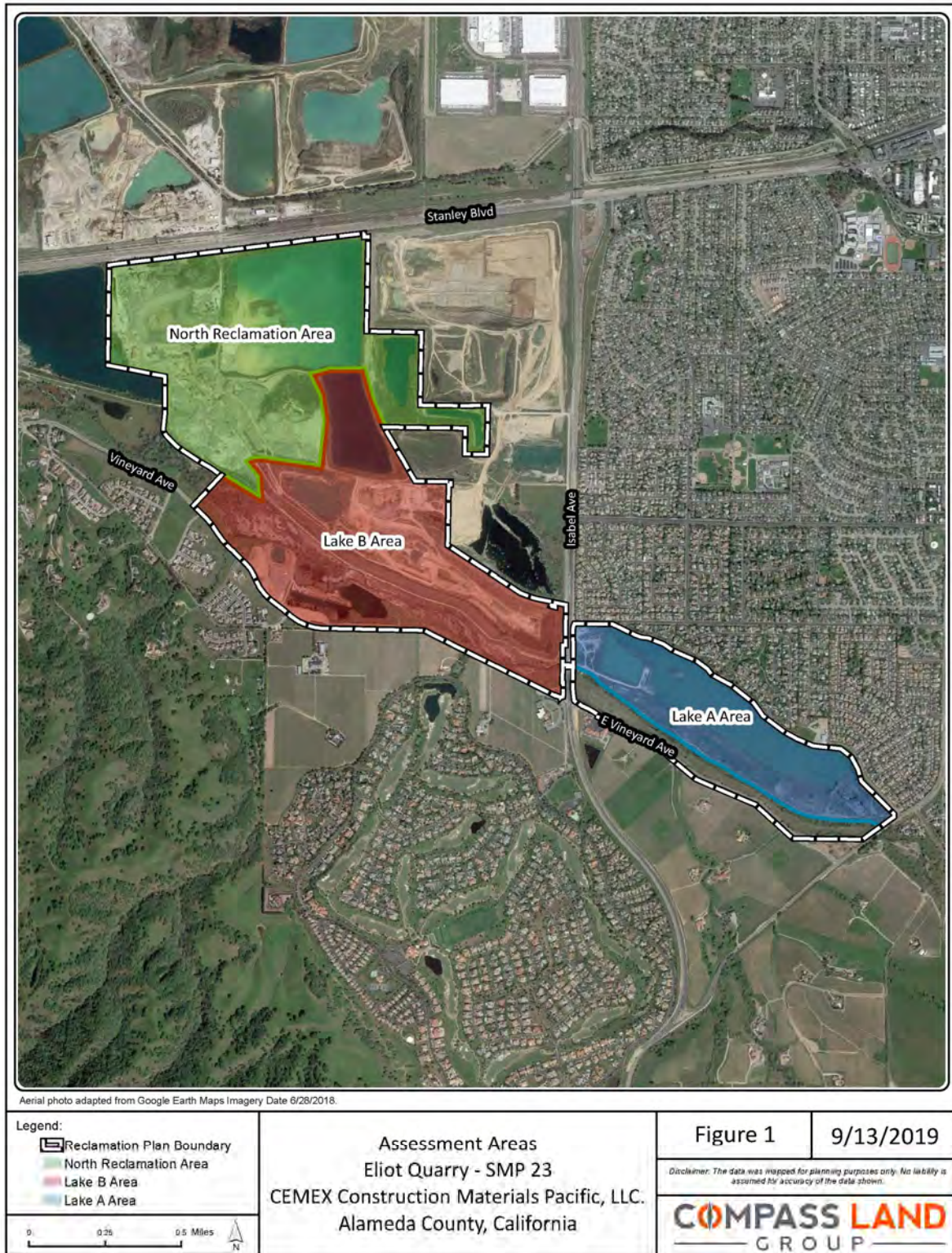


Figure 2

Default Values for Metal Content in Fugitive Dust

Name	Aggregate (Sand & Gravel) PM ₁₀							
Applicability	Use this spreadsheet to calculate PM ₁₀ emissions generated from Aggregate Plant operations (Crushing, Screening, and Transfer Points). Entries required in yellow areas, output in grey areas.							
Author or updater	Matthew Cegielski	Last Update	June 23, 2016					
Facility:	Cemex Pleasanton Reclamation							
ID#:								
Project #:								
Inputs	lb/hr	lb/yr	Formula					
PM ₁₀ Process Rate	0.46	1095.40	Emissions are calculated by the multiplication of PM ₁₀ Rates and Emission Factors.					
Substance	CAS#	Wt Fraction Aggregate*	Aggregate LB/HR	Aggregate LB/YR				
Aluminum	7429905	1.50E-02	6.90E-03	1.64E+01				
Arsenic	7440382	2.20E-05	1.01E-05	2.41E-02				
Barium	7440393	2.25E-04	1.04E-04	2.46E-01				
Beryllium	7440417	1.00E-06	4.60E-07	1.10E-03				
Cadmium	7440439	1.00E-06	4.60E-07	1.10E-03				
Chromium	7440473	2.80E-05	1.29E-05	3.07E-02				
Cobalt	7440484	1.10E-05	5.06E-06	1.20E-02				
Copper	7440508	3.70E-05	1.70E-05	4.05E-02				
Hexavalent Chromium!	18540299	1.40E-06	6.44E-07	1.53E-03				
Lead	7439921	5.00E-05	2.30E-05	5.48E-02				
Manganese	7439965	5.30E-04	2.44E-04	5.81E-01				
Nickel	7440020	2.80E-05	1.29E-05	3.07E-02				
Respirable Silica**	1175	6.38E-02	2.94E-02	6.99E+01				
Selenium	7782492	1.00E-06	4.60E-07	1.10E-03				
Zinc	7440666	9.90E-05	4.55E-05	1.08E-01				
References:	<p>*The emission factors are from the table, "DEFAULT VALUES - TRACE METAL CONCENTRATIONS" in the November 1998 San Diego Air Pollution Control District document, <i>Aggregate Crushing Operations</i>.</p> <p>Pollutants required for toxic reporting: TACs w/o Risk Factor Current as of update date</p> <p>!5% of Chromium considered Hexavalent Chromium (District Policy).</p> <p>**The emission factor is derived from ratio of Silica PM₄ to PM₁₀ in the 2009 technical paper from the Journal of Air and Waste Management Association (JAWMA), PM₄ Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California. The average of the equipment data from the Vernalis plant in Tracy was used.</p>							

Figure 3

Modeling Domain

5,500 meters x 4,300 meters

50 meter grid spacing



Table 1
Summary of Annual DPM Emissions

CEMEX Construction Materials Pacific, LLC.
Eliot Quarry SMP-23 Reclamation Plan Amendment Project
Health Risk Assessment



AVERAGE ANNUAL PM2.5 EXHAUST EMISSIONS (TONS/YEAR)

Lake A Area Reclamation			Lake B Area Reclamation			North Area Reclamation		
		PM2.5			PM2.5			PM2.5
Year	Calendar Year	Exhaust (tons/yr)	Year	Calendar Year	Exhaust (tons/yr)	Year	Calendar Year	Exhaust (tons/yr)
1	2022	0.0552	1	2022	0.2059	1	2022	0
2	2023	5.79E-03	2	2023	0	2	2023	0
3	2024	0	3	2024	0	3	2024	0
4	2025	0	4	2025	0	4	2025	0
5	2026	0	5	2026	0	5	2026	0
6	2027	0	6	2027	0	6	2027	0
7	2028	0	7	2028	0.0128	7	2028	0
8	2029	0	8	2029	0	8	2029	0
9	2030	0	9	2030	3.10E-04	9	2030	3.37E-03
10	2031	0	10	2031	0	10	2031	0
11	2032	0	11	2032	0	11	2032	0
12	2033	0	12	2033	0	12	2033	0
13	2034	0	13	2034	0	13	2034	0
14	2035	0	14	2035	0	14	2035	0
15	2036	0	15	2036	0	15	2036	0
16	2037	0	16	2037	0	16	2037	0
17	2038	0	17	2038	0	17	2038	0
18	2039	0	18	2039	0	18	2039	0
19	2040	0	19	2040	0	19	2040	0
20	2041	0	20	2041	0	20	2041	0
21	2042	0	21	2042	0	21	2042	0
22	2043	0	22	2043	0	22	2043	0
23	2044	0	23	2044	0	23	2044	0
24	2045	0	24	2045	0	24	2045	0
25	2046	0	25	2046	0	25	2046	0
26	2047	0	26	2047	0	26	2047	0
27	2048	0	27	2048	0	27	2048	0
28	2049	0	28	2049	1.18E-03	28	2049	0.0125
29	2050	0	29	2050	0	29	2050	0
30	2051	0	30	2051	0	30	2051	0
Average:		0.002033	Average:		0.00734	Average:		0.000529

Source:

Air and Greenhouse Gas Emissions Study (Compass Land Group, December 2019).

Notes:

1. For Lake A Area Reclamation, results from Appendix A-3.
2. For Lake B Area Reclamation, results from Appendix A-4 and A-5. Year 28 (2049) result is CalEEMod proxy for 2056 reclamation emissions.
3. For North Area Reclamation, results from Appendix A-6. Year 28 (2049) result is CalEEMod proxy for 2056 reclamation emissions.

Table 2
Estimate of Annual Daily Emissions of Respirable Silica

Area	%	PM-10 Emissions		Respirable Silica Emissions		
	Respirable Silica	Max. Annual	Max. Daily	Annual	Daily	Hourly
		(tons/yr)	(lbs/day)	(lbs/yr)	(lbs/day)	(lbs/hr)
Lake A Area	5.4%	0.27	69.64	29.16	18.8	1.88
Lake B Area	5.8%	0.17	33.62	19.72	5.7	0.57
North Area	5.0%	0.10	52.43	10.0	5.2	0.52

Notes

1. PM-10 Emissions from Table A-1 and A-2, Appendix A. Air and Greenhouse Study, Rev. December 2019

2. Calculations:

Annual Silica (lbs/yr) = Annual PM-10 Emissions x % Silica x 2000 lbs/ton

Daily Silica (lbs/day) = Daily PM-10 Emissions x % Silica

Hourly Silica (lbs/hr) = $\frac{\text{Daily PM-10 Emissions} \times \% \text{ Silica}}{10 \text{ hrs/day}}$

Table 3
Annual Emission Rates of Metals (lbs/yr) Based on Lab Analysis of Metal Content of Soil
[Metal Concentration Units: mg/Kg or ppm by wt.]

			Al	Sb	As	Ba	Be	Cr	Co	Cu	Pb	Hg	Ni	V	Zn		
North Reclamation Plant			18,000	0	5.6	170		64	9.8	25	10		71	53	50		
North Reclamation Pond			11,000	0	3.6	210		45	6.2	17	5.5		52	36	31		
North Reclamation Stockpiles			23,000	0.56	5.8	130		65	10	25	7		71	48	50		
Average (ppm by wt)			17,333	0.19	5.00	170.00	0.00	58.00	8.67	22.33	7.50	0.00	64.67	45.67	43.67		
Max. Annual PM-10 Emission Rate (Ref: Table A-2 Appendix A)			(tons/yr)	0.1	3.47E+00	3.73E-05	1.00E-03	3.40E-02	0.00E+00	1.16E-02	1.73E-03	4.47E-03	1.50E-03	0.00E+00	1.29E-02	9.13E-03	8.73E-03
Lake B Pit			15,000		5	110		49	8.3	24	4.7	0.064	79	34	41		
Lake B TopCon			20,000	0.57	7	220	0.5	84	11	29	9		89	59	61		
Lake B ADV Berm			21,000	0.6	7.5	240	0.54	95	14	30	11	0.096	110	54	65		
Average (ppm by wt)			18,667	0.39	6.50	190.00	0.35	76.00	11.10	27.67	8.23	0.05	92.67	49.00	55.67		
Max. Annual PM-10 Emission Rate (Ref: Table A-2 Appendix A)			(tons/yr)	0.17	6.35E+00	1.33E-04	2.21E-03	6.46E-02	1.18E-04	2.58E-02	3.77E-03	9.41E-03	2.80E-03	1.81E-05	3.15E-02	1.67E-02	1.89E-02
Lake A Pipe			21,000	0.27	7.7	190	0.55	80	14	30	9.8	0.054	100	53	62		
Lake A Stockpile			16,000	0.54	6.4	160		78	12	29	19	0.065	95	46	66		
Lake A DivStr			19,000	6.9	140	140		85	11	29	6.3	0.078	110	42	49		
Average (ppm by wt)			18,667	2.57	51.37	163.33	0.18	81.00	12.33	29.33	11.70	0.07	101.67	47.00	59.00		
Max. Annual PM-10 Emission Rate (Ref: Table A-2 Appendix A)			(tons/yr)	0.27	1.01E+01	1.39E-03	2.77E-02	8.82E-02	9.90E-05	4.37E-02	6.66E-03	1.58E-02	6.32E-03	3.55E-05	5.49E-02	2.54E-02	3.19E-02

Table 4
Hourly Emission Rates of Metals Based on Lab Analysis of Metal Content of Soil
[Metal Concentration Units: mg/Kg or ppm by wt.]

			Al	Sb	As	Ba	Be	Cr	Co	Cu	Pb	Hg	Ni	V	Zn
North Reclamation Plant			18,000	0	5.6	170		64	9.8	25	10		71	53	50
North Reclamation Pond			11,000	0	3.6	210		45	6.2	17	5.5		52	36	31
North Reclamation Stockpiles			23,000	0.56	5.8	130		65	10	25	7		71	48	50
Average (ppm by wt)			17,333	0.19	5.00	170.00	0.00	58.00	8.67	22.33	7.50	0.00	64.67	45.67	43.67
Max. daily PM-10 Emission Rate (Ref: Table A-1 Appendix A)	(lbs/day)	8.67	1.50E-01	1.62E-06	4.34E-05	1.47E-03	0.00E+00	5.03E-04	7.51E-05	1.94E-04	6.50E-05	0.00E+00	5.61E-04	3.96E-04	3.79E-04
	(lbs/hr)	1.0838	1.88E-02	2.02E-07	5.42E-06	1.84E-04	0.00E+00	6.29E-05	9.39E-06	2.42E-05	8.13E-06	0.00E+00	7.01E-05	4.95E-05	4.73E-05

Lake B Pit			15,000		5	110		49	8.3	24	4.7	0.064	79	34	41
Lake B TopCon			20,000	0.57	7	220	0.5	84	11	29	9		89	59	61
Lake B ADV Berm			21,000	0.6	7.5	240	0.54	95	14	30	11	0.096	110	54	65
Average (ppm by wt)			18,667	0.39	6.50	190.00	0.35	76.00	11.10	27.67	8.23	0.05	92.67	49.00	55.67
Max. Daily PM-10 Emission Rate (Ref: Table A-1 Appendix A)	(lbs/day)	52.43	9.79E-01	2.04E-05	3.41E-04	9.96E-03	1.82E-05	3.98E-03	5.82E-04	1.45E-03	4.32E-04	2.80E-06	4.86E-03	2.57E-03	2.92E-03
	(lbs/hr)	6.5538	1.22E-01	2.56E-06	4.26E-05	1.25E-03	2.27E-06	4.98E-04	7.27E-05	1.81E-04	5.40E-05	3.50E-07	6.07E-04	3.21E-04	3.65E-04

Lake A Pipe			21,000	0.27	7.7	190	0.55	80	14	30	9.8	0.054	100	53	62
Lake A Stockpile			16,000	0.54	6.4	160		78	12	29	19	0.065	95	46	66
Lake A DivStr			19,000	6.9	140	140		85	11	29	6.3	0.078	110	42	49
Average (ppm by wt)			18,667	2.57	51.37	163.33	0.18	81.00	12.33	29.33	11.70	0.07	101.67	47.00	59.00
Max. Daily PM-10 Emission Rate (Ref: Table A-1 Appendix A)	(lbs/day)	69.64	1.30E+00	1.79E-04	3.58E-03	1.14E-02	1.28E-05	5.64E-03	8.59E-04	2.04E-03	8.15E-04	4.57E-06	7.08E-03	3.27E-03	4.11E-03
	(lbs/hr)	8.705	1.62E-01	2.24E-05	4.47E-04	1.42E-03	1.60E-06	7.05E-04	1.07E-04	2.55E-04	1.02E-04	5.72E-07	8.85E-04	4.09E-04	5.14E-04

Table 5
Estimate of Fraction of Respirable Silica

CEMEX Construction Materials Pacific, LLC.
Eliot Quarry SMP-23 Reclamation Plan Amendment Project
Health Risk Assessment



RESPIRABLE SILICA WEIGHT FRACTION (BASED ON SITE-SPECIFIC SOIL SAMPLING)
(to be multiplied by PM₁₀ process rate for use in analysis)

Lab ID	Description	Quartz Weight %	Respirable Factor ¹	Est. Respirable Silica %	Max. Annual PM-10 Emissions (tons/yr)	Max. Annual Silica Emissions (lbs/yr)
Lake A Area Reclamation						
1911996-007A	Lake A Rec - Future Pipe to Lakes B/C	11.5	0.44	5.1		
1911996-008A	Lake A Rec - Stockpile	11.4	0.44	5.0		
1911996-009A	Lake A Rec - Future ADV Diversion Structure	13.6	0.44	6.0		
	Average:	12.2	0.44	5.4	0.27	28.91
Lake B Area Reclamation						
1911996-004A	Lake B Rec - Mining Pit	16.0	0.44	7.0		
1911996-005A	Lake B Rec - Topcon Area	12.3	0.44	5.4		
1911996-006A	Lake B Rec - Berm along Arroyo del Valle	11.3	0.44	5.0		
	Average:	13.2	0.44	5.8	0.17	19.75
North Area Reclamation						
1911996-001A	North Area Rec - Plant Site	12.6	0.44	5.5		
1911996-002A	North Area Rec - Silt Pond	8.6	0.44	3.8		
1911996-003A	North Area Rec - Stockpile	12.8	0.44	5.6		
	Average:	11.3	0.44	5.0	0.1	9.97

Sources:

1. Analytical Report, Eliot Metals Soil Sampling (McC Campbell Analytical, Inc. December 6, 2019).
2. *PM₄ Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California* (Richards et al., November 2009), published in the Journal of the Air & Waste Management Association, Vol. 59.

Notes:

1. Based on the aggregate industry study (Richards et al., November 2009), the concentration of crystalline silica in PM₄ (respirable) PM averaged 44% of the crystalline silica content of the bulk mineral.



McC Campbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1911996

Report Created for: Compass Land Group

3140 Peacekeeper Way #102
McClellan Park, CA 95652

Project Contact: Yasha Saber

Project P.O.: 012

Project: Eliot Metals Soil Sampling

Project Received: 11/21/2019

Analytical Report reviewed & approved for release on 12/02/2019 by:

Christine Askari
Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.





Glossary of Terms & Qualifier Definitions

Client: Compass Land Group
Project: Eliot Metals Soil Sampling
WorkOrder: 1911996

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
LQL	Lowest Quantitation Level
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
TZA	TimeZone Net Adjustment for sample collected outside of MAI's UTC.
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)



X-Ray Diffraction Analysis of Project "Eliot Metals Soil Sampling"

[MAI ID 1911996-001A to -009A]

Report prepared by Kelly Chen

McC Campbell Analytical received samples 1911996-001A to -009A for X-ray diffraction (XRD) analysis on 11/21/2019. A table of the client and laboratory sample IDs is listed in Table 1. The samples were ground using a Spex 8000-D Mixer Mill and passed through a No. 325 (45 μ m) sieve. The powders were pressed into poly(methyl methacrylate) sample holders and measured using a Bruker D8 Advance Series I X-ray diffractometer with a Cu K α monochromatic source operating at 40 kV and 30 mA and fitted with a 9-position flipstick autosampler. The measurements were obtained from 5 to 70°2 θ at a stepsize of 0.05° and steptime of 1 second/step.

Client ID	Lab ID
NRA-Plant	1911996-001A
NRA-Pond	1911996-002A
NRA-Stockpile	1911996-003A
LB-Pit	1911996-004A
LB-TopCon	1911996-005A
LB-ADVBerm	1911996-006A
LA-Pipe	1911996-007A
LA-Stockpile	1911996-008A
LA-DivStr	1911996-009A

Table 1. Client and lab sample IDs.

The identities of the crystalline components of the samples are made by comparing the measured sample patterns to known reference patterns using the International Centre for Diffraction Data PDF-2 database. The XRD patterns of samples 1911996-001A to -009A are shown in Figures 1-9. The crystalline components of 1911996-001A to -009A is varying amounts of silica (quartz) based on the three main peaks at 20.85, 26.66, and 50.16°2 θ and sodium aluminum silicate. Due to the low intensities of the XRD patterns, crystalline silica is likely a minor component of the overall samples.

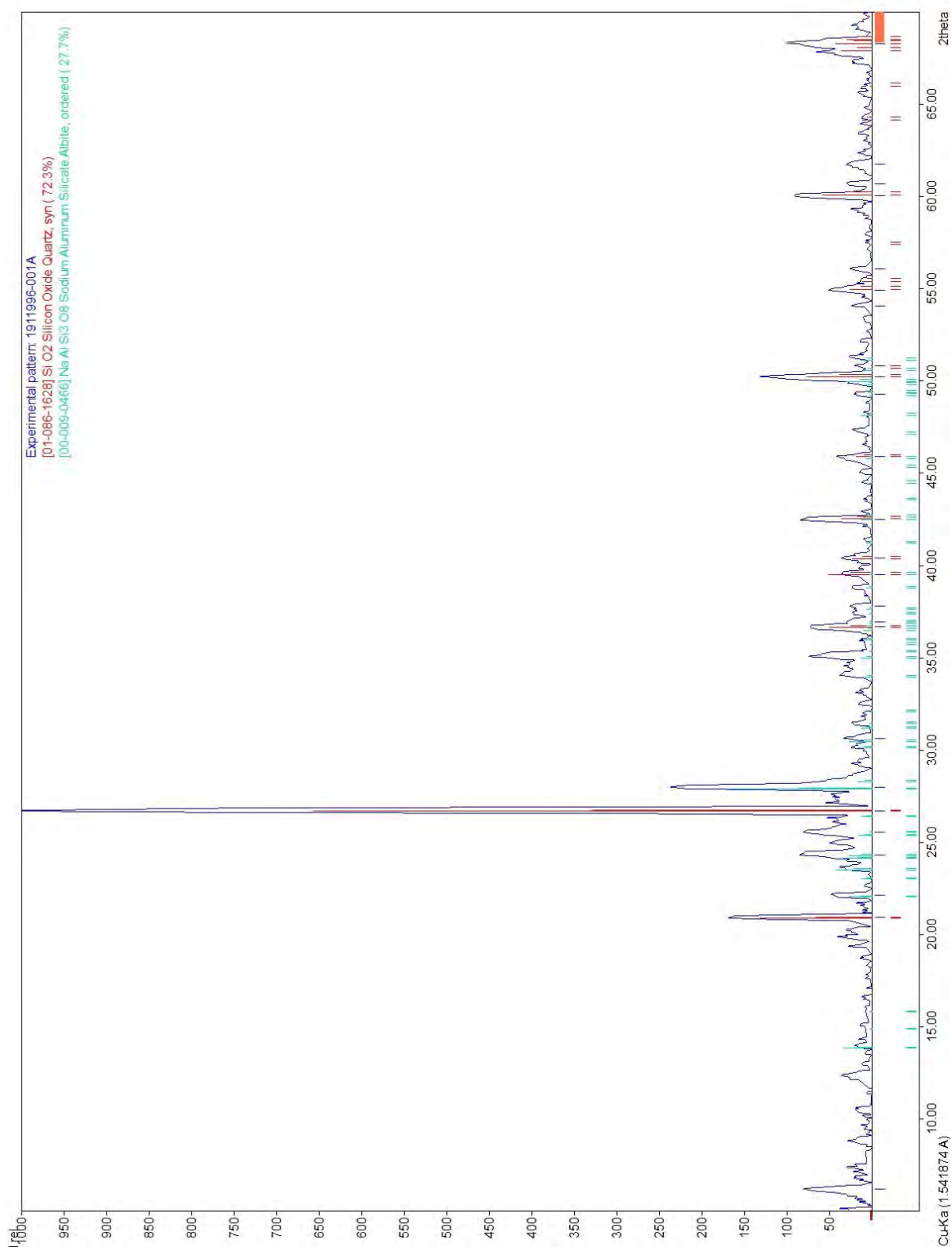


Figure 1. XRD pattern of 1911996-001A (blue trace), quartz (red lines), and sodium aluminum silicate (green lines).

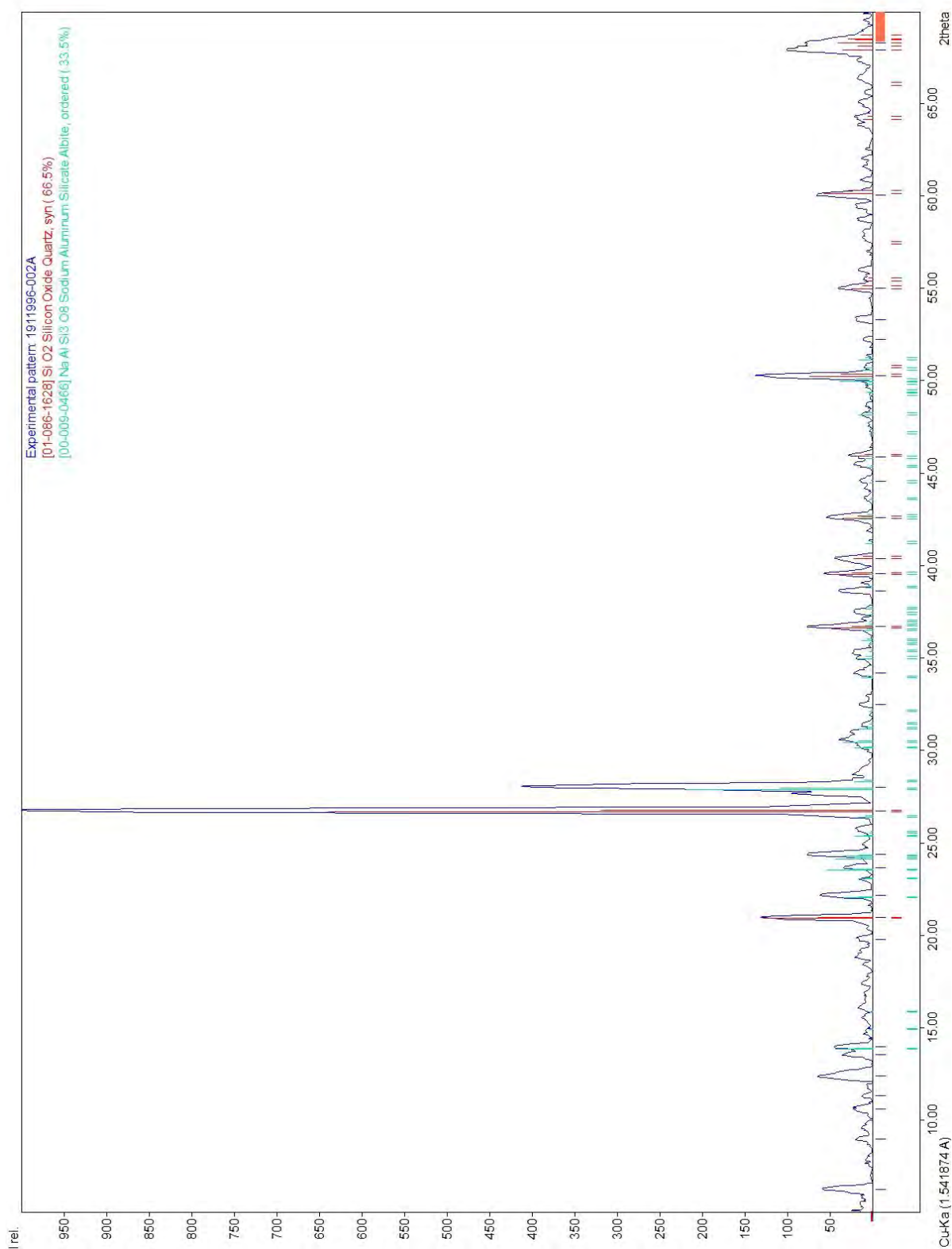


Figure 2. XRD pattern of 1911996-002A (blue trace), quartz (red lines), and sodium aluminum silicate (green lines).

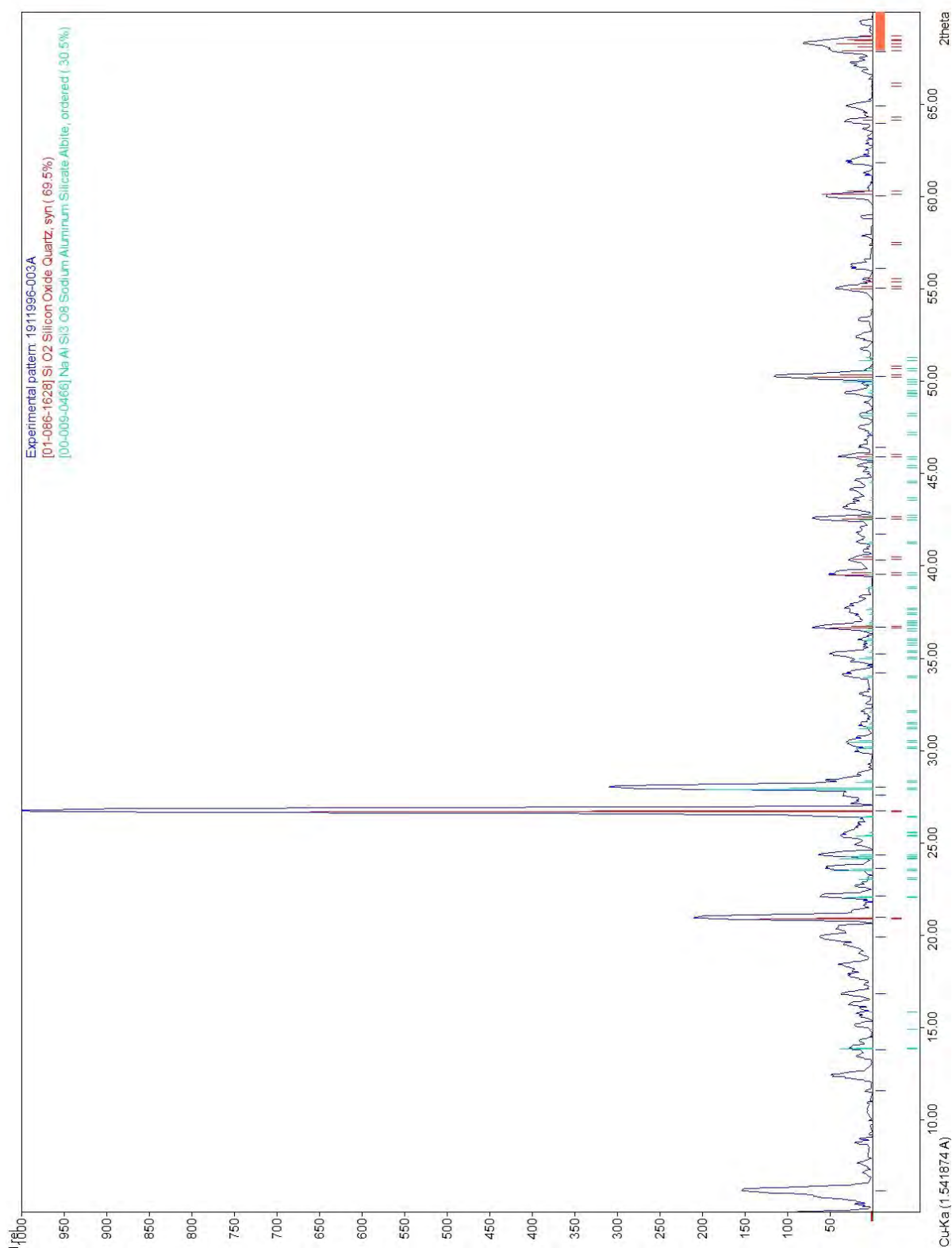


Figure 3. XRD pattern of 1911996-003A (blue trace), quartz (red lines), and sodium aluminum silicate (green lines).

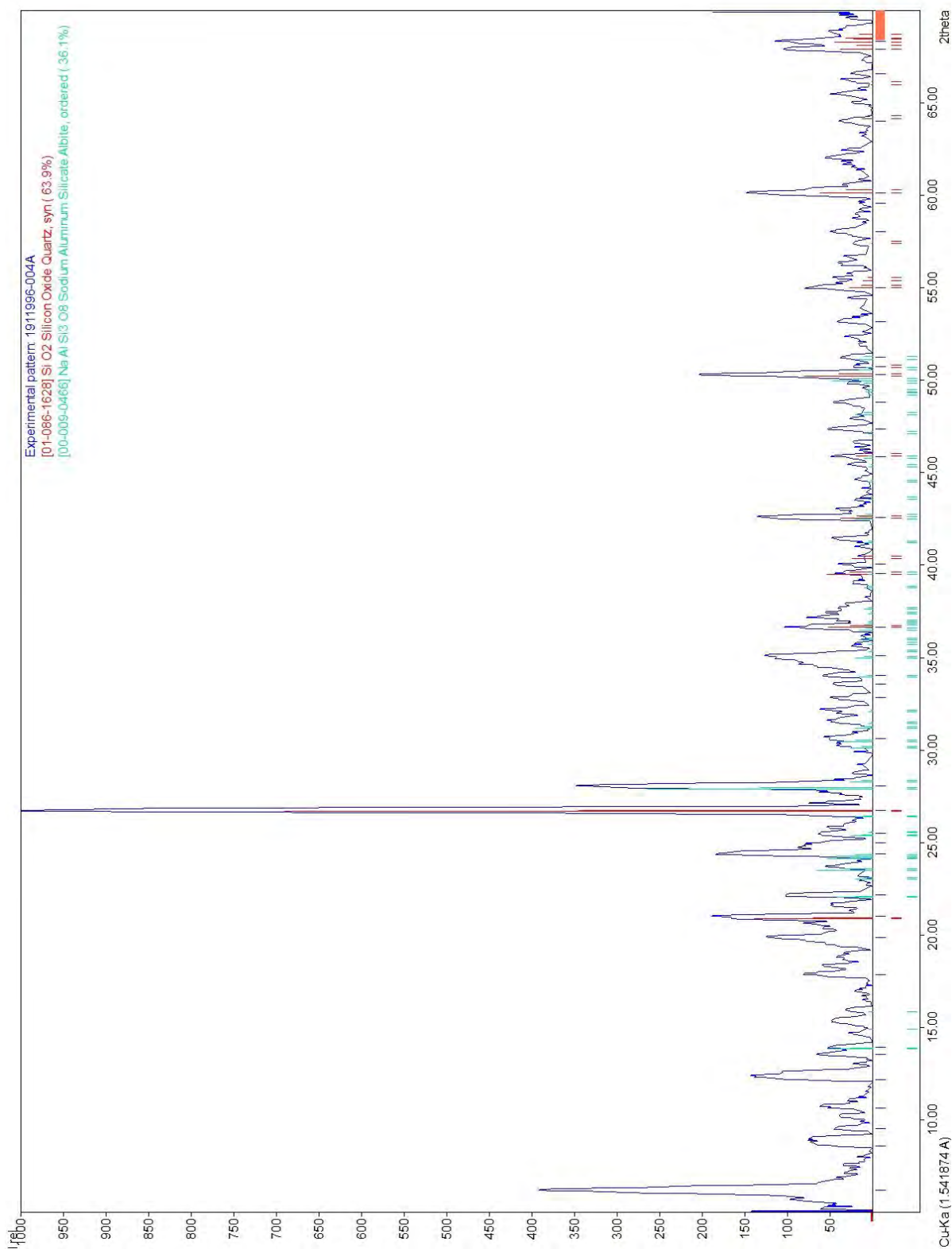


Figure 4. XRD pattern of 1911996-004A (blue trace), quartz (red lines), and sodium aluminum silicate (green lines).

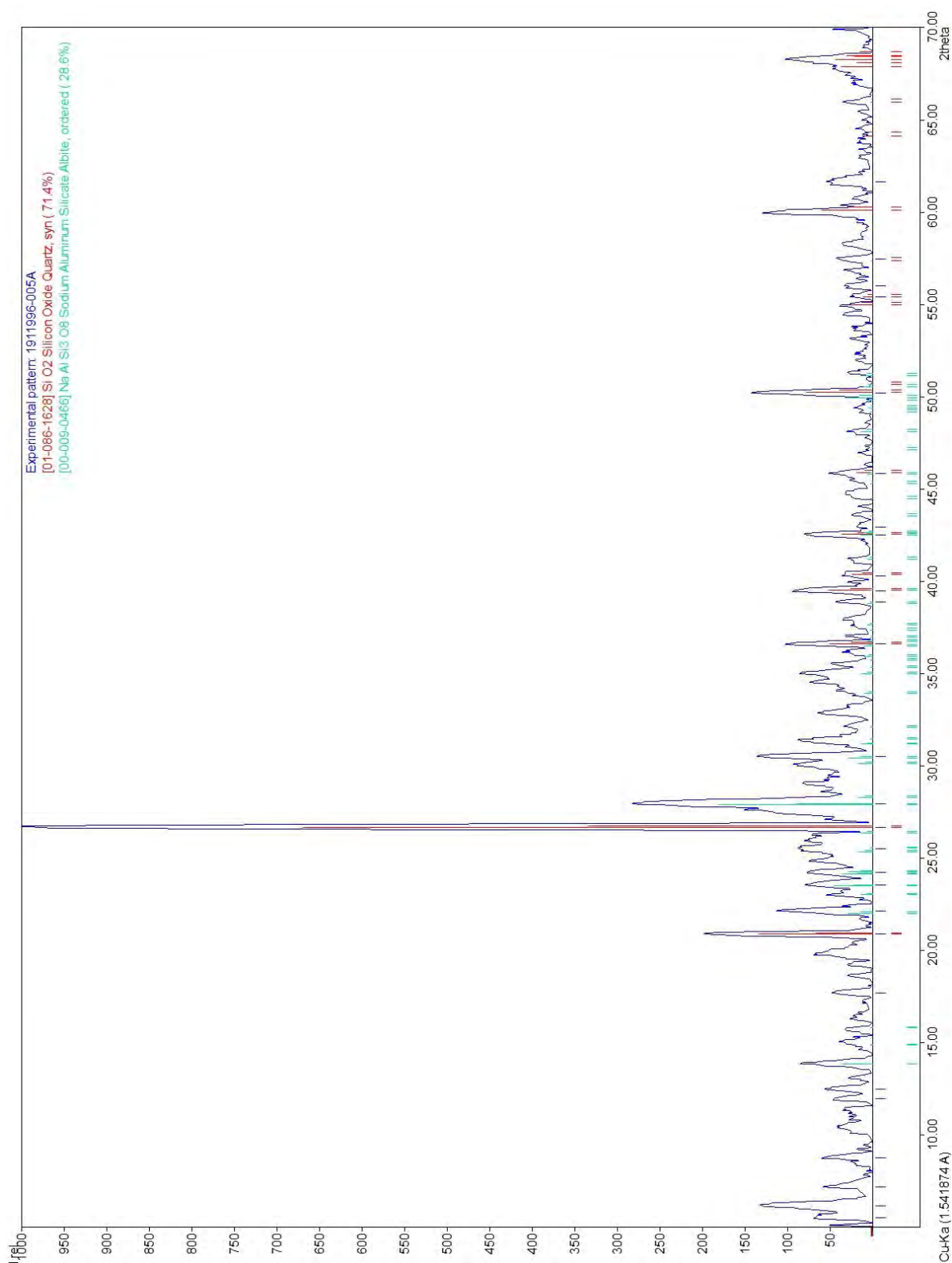


Figure 5. XRD pattern of 1911996-005A (blue trace), quartz (red lines), and sodium aluminum silicate (green lines).

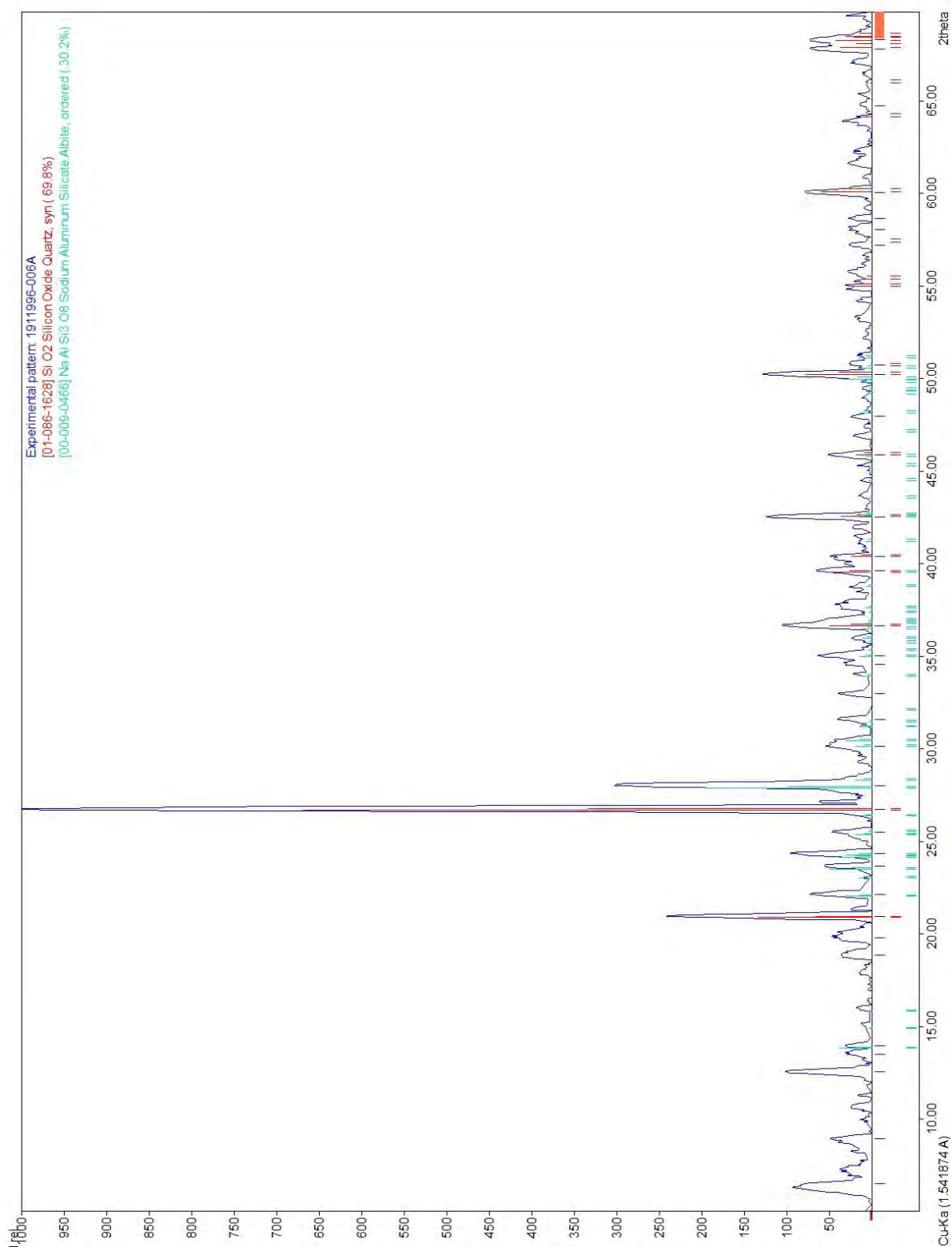


Figure 6. XRD pattern of 1911996-006A (blue trace), quartz (red lines), and sodium aluminum silicate (green lines).

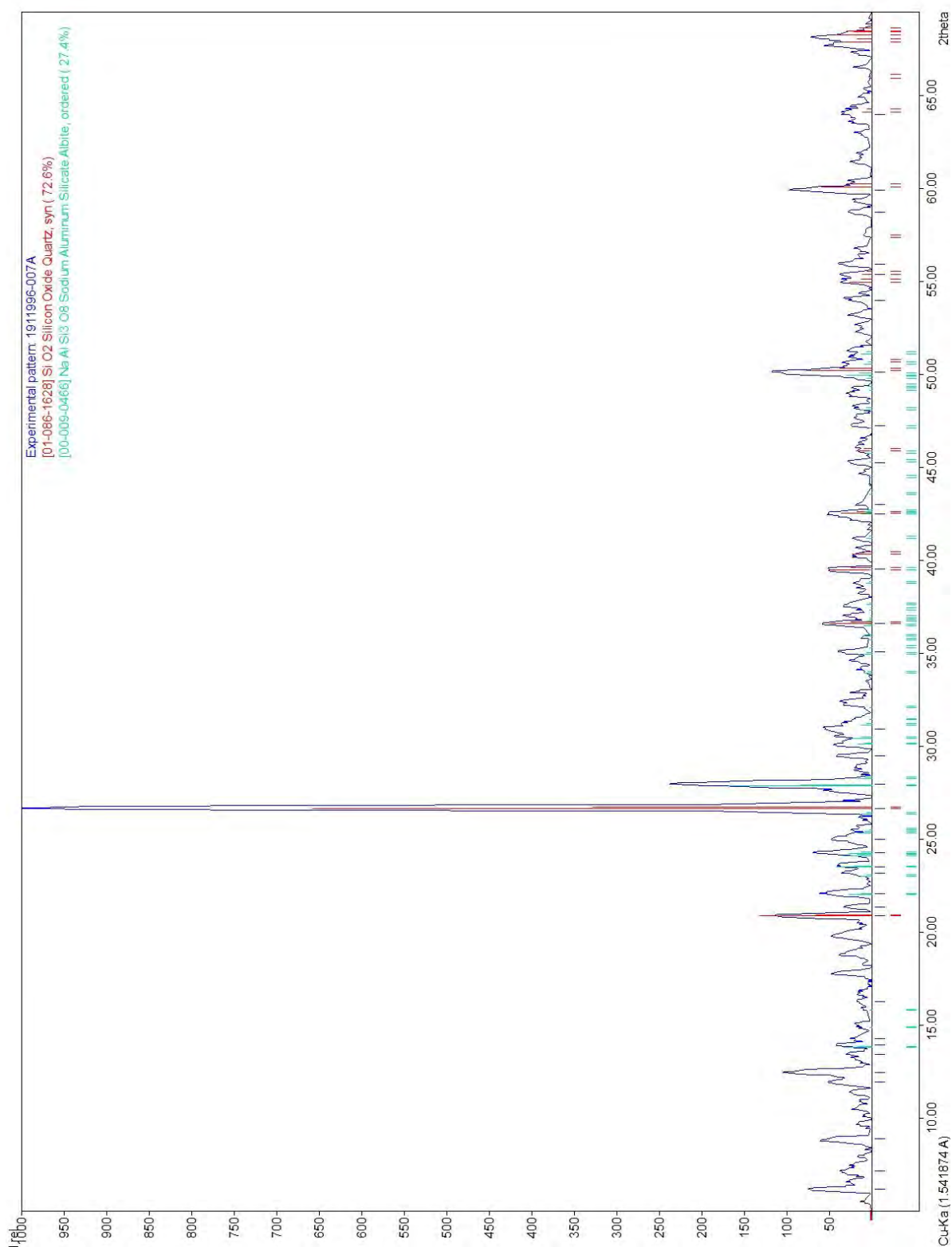


Figure 7. XRD pattern of 1911996-007A (blue trace), quartz (red lines), and sodium aluminum silicate (green lines).

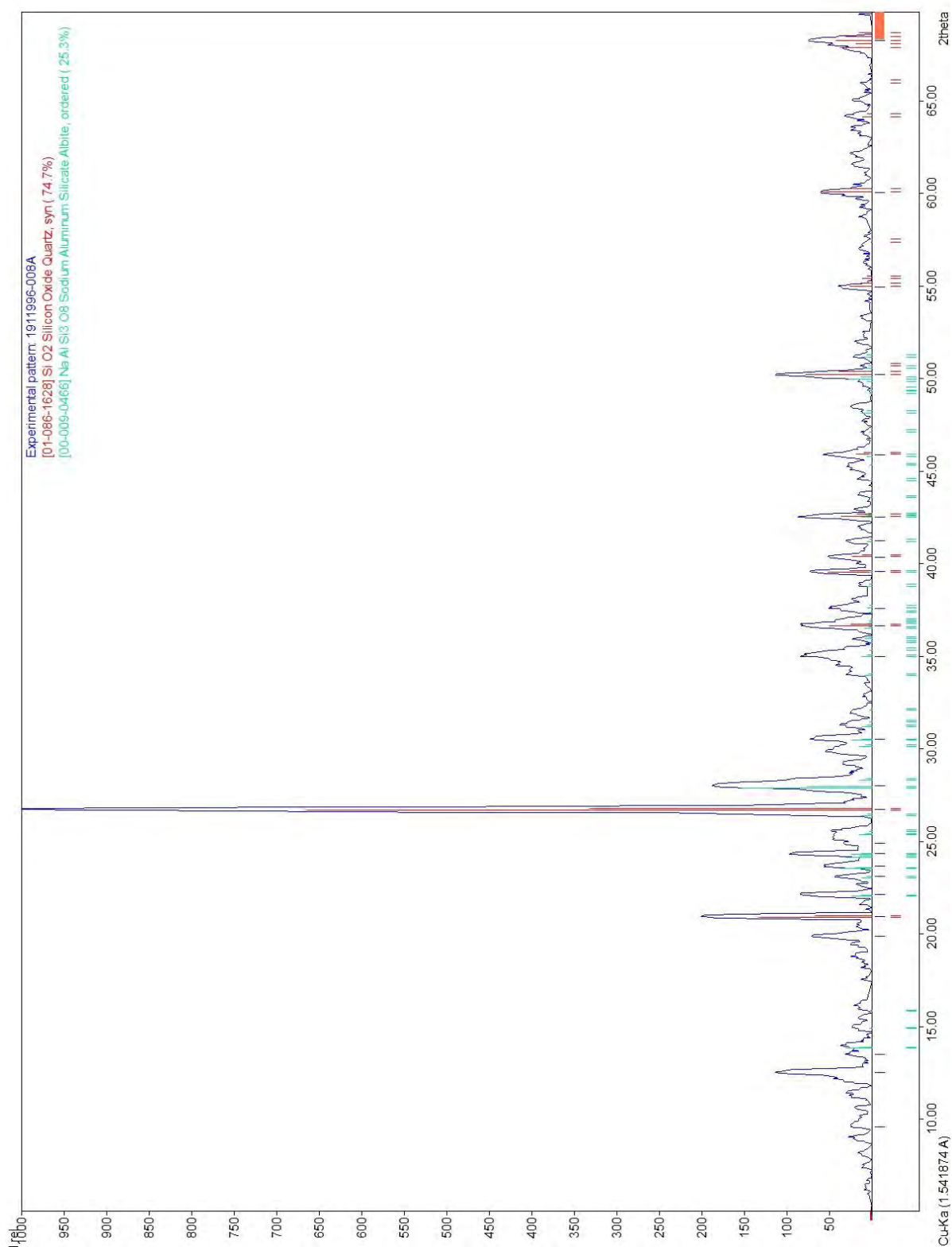


Figure 8. XRD pattern of 1911996-008A (blue trace), quartz (red lines), and sodium aluminum silicate (green lines).

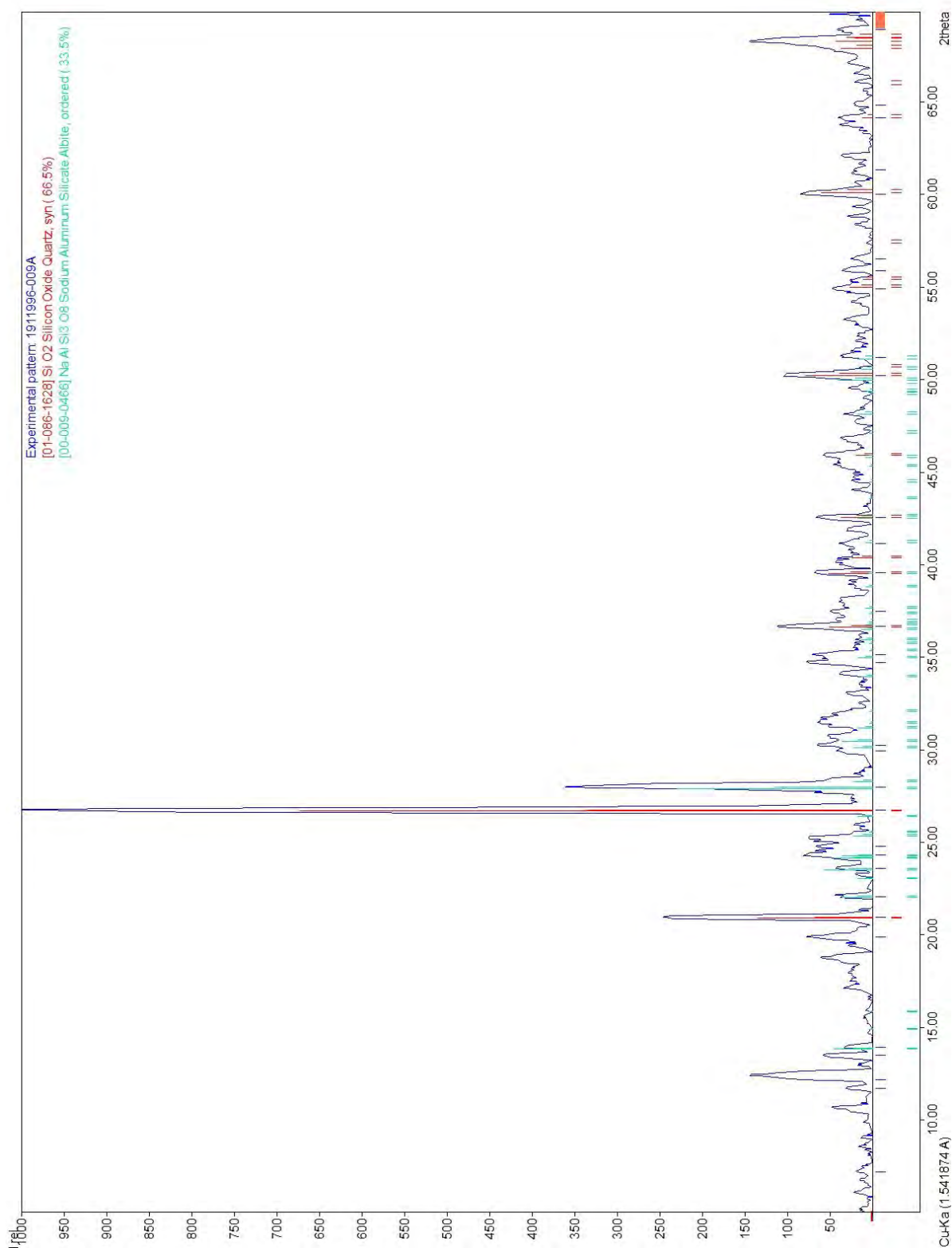


Figure 9. XRD pattern of 1911996-009A (blue trace), quartz (red lines), and sodium aluminum silicate (green lines).



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/22/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3060A
Analytical Method: SW7199
Unit: mg/Kg

Hexavalent chromium by Alkaline Digestion and IC Analysis

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
NRA-Plant	1911996-001A	Soil	11/21/2019 12:45	IC2 19112510.CHW	189426

Analytes	Result	RL	DF	Date Analyzed
Hexavalent chromium	ND	0.20	1	11/25/2019 14:39

Analyst(s): AO

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
NRA-Pond	1911996-002A	Soil	11/21/2019 13:02	IC2 19112511.CHW	189426

Analytes	Result	RL	DF	Date Analyzed
Hexavalent chromium	ND	0.20	1	11/25/2019 14:51

Analyst(s): AO

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
NRA-Stockpile	1911996-003A	Soil	11/21/2019 12:26	IC2 19112514.CHW	189426

Analytes	Result	RL	DF	Date Analyzed
Hexavalent chromium	ND	0.20	1	11/25/2019 15:28

Analyst(s): AO

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LB-Pit	1911996-004A	Soil	11/21/2019 12:08	IC2 19112515.CHW	189426

Analytes	Result	RL	DF	Date Analyzed
Hexavalent chromium	ND	0.20	1	11/25/2019 15:40

Analyst(s): AO

(Cont.)



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/22/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3060A
Analytical Method: SW7199
Unit: mg/Kg

Hexavalent chromium by Alkaline Digestion and IC Analysis

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LB-TopCon	1911996-005A	Soil	11/21/2019 10:07	IC2 19112516.CHW	189426

Analytes	Result	RL	DF	Date Analyzed
Hexavalent chromium	ND	0.20	1	11/25/2019 15:52

Analyst(s): AO

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LB-ADV Berm	1911996-006A	Soil	11/21/2019 10:21	IC2 19112517.CHW	189426

Analytes	Result	RL	DF	Date Analyzed
Hexavalent chromium	0.24	0.20	1	11/25/2019 16:04

Analyst(s): AO

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LA-Pipe	1911996-007A	Soil	11/21/2019 10:50	IC2 19112518.CHW	189426

Analytes	Result	RL	DF	Date Analyzed
Hexavalent chromium	ND	0.20	1	11/25/2019 16:16

Analyst(s): AO

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LA-Stockpile	1911996-008A	Soil	11/21/2019 11:04	IC2 19112519.CHW	189426

Analytes	Result	RL	DF	Date Analyzed
Hexavalent chromium	ND	0.20	1	11/25/2019 16:29

Analyst(s): AO

(Cont.)



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/22/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3060A
Analytical Method: SW7199
Unit: mg/Kg

Hexavalent chromium by Alkaline Digestion and IC Analysis

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LA-DivStr	1911996-009A	Soil	11/21/2019 11:23	IC2 19112520.CHW	189426

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Hexavalent chromium	ND	0.20	1	11/25/2019 16:41

Analyst(s): AO



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/21/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg

CAM / CCR 17 Metals + Misc. Elements

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
NRA-Plant	1911996-001A	Soil	11/21/2019 12:45	ICP-MS3 072SMPL.D	189281

Analytes	Result	RL	DF	Date Analyzed
Aluminum	18,000	500	10	11/22/2019 16:15
Antimony	ND	0.50	1	11/22/2019 14:56
Arsenic	5.6	0.50	1	11/22/2019 14:56
Barium	170	5.0	1	11/22/2019 14:56
Beryllium	ND	0.50	1	11/22/2019 14:56
Cadmium	ND	0.25	1	11/22/2019 14:56
Chromium	64	0.50	1	11/22/2019 14:56
Cobalt	9.8	0.50	1	11/22/2019 14:56
Copper	25	0.50	1	11/22/2019 14:56
Lead	10	0.50	1	11/22/2019 14:56
Mercury	ND	0.050	1	11/22/2019 14:56
Molybdenum	ND	0.50	1	11/22/2019 14:56
Nickel	71	0.50	1	11/22/2019 14:56
Selenium	ND	0.50	1	11/22/2019 14:56
Silver	ND	0.50	1	11/22/2019 14:56
Thallium	ND	0.50	1	11/22/2019 14:56
Vanadium	53	0.50	1	11/22/2019 14:56
Zinc	50	5.0	1	11/22/2019 14:56

Surrogates	REC (%)	Limits	
Terbium	120	70-130	11/22/2019 14:56

Analyst(s): ND



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/21/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg

CAM / CCR 17 Metals + Misc. Elements

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
NRA-Pond	1911996-002A	Soil	11/21/2019 13:02	ICP-MS3 073SMPL.D	189281

Analytes	Result	RL	DF	Date Analyzed
Aluminum	11,000	500	10	11/22/2019 16:22
Antimony	ND	0.50	1	11/22/2019 15:02
Arsenic	3.6	0.50	1	11/22/2019 15:02
Barium	210	5.0	1	11/22/2019 15:02
Beryllium	ND	0.50	1	11/22/2019 15:02
Cadmium	ND	0.25	1	11/22/2019 15:02
Chromium	45	0.50	1	11/22/2019 15:02
Cobalt	6.2	0.50	1	11/22/2019 15:02
Copper	17	0.50	1	11/22/2019 15:02
Lead	5.5	0.50	1	11/22/2019 15:02
Mercury	ND	0.050	1	11/22/2019 15:02
Molybdenum	ND	0.50	1	11/22/2019 15:02
Nickel	52	0.50	1	11/22/2019 15:02
Selenium	ND	0.50	1	11/22/2019 15:02
Silver	ND	0.50	1	11/22/2019 15:02
Thallium	ND	0.50	1	11/22/2019 15:02
Vanadium	36	0.50	1	11/22/2019 15:02
Zinc	31	5.0	1	11/22/2019 15:02

Surrogates	REC (%)	Limits	
Terbium	119	70-130	11/22/2019 15:02

Analyst(s): ND

(Cont.)



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/21/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg

CAM / CCR 17 Metals + Misc. Elements

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
NRA-Stockpile	1911996-003A	Soil	11/21/2019 12:26	ICP-MS3 074SMPL.D	189281

Analytes	Result	RL	DF	Date Analyzed
Aluminum	23,000	500	10	11/22/2019 16:28
Antimony	0.56	0.50	1	11/22/2019 15:08
Arsenic	5.8	0.50	1	11/22/2019 15:08
Barium	130	5.0	1	11/22/2019 15:08
Beryllium	ND	0.50	1	11/22/2019 15:08
Cadmium	ND	0.25	1	11/22/2019 15:08
Chromium	65	0.50	1	11/22/2019 15:08
Cobalt	10	0.50	1	11/22/2019 15:08
Copper	25	0.50	1	11/22/2019 15:08
Lead	7.0	0.50	1	11/22/2019 15:08
Mercury	ND	0.050	1	11/22/2019 15:08
Molybdenum	ND	0.50	1	11/22/2019 15:08
Nickel	71	0.50	1	11/22/2019 15:08
Selenium	ND	0.50	1	11/22/2019 15:08
Silver	ND	0.50	1	11/22/2019 15:08
Thallium	ND	0.50	1	11/22/2019 15:08
Vanadium	48	0.50	1	11/22/2019 15:08
Zinc	50	5.0	1	11/22/2019 15:08

Surrogates	REC (%)	Limits	
Terbium	112	70-130	11/22/2019 15:08

Analyst(s): ND



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/21/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg

CAM / CCR 17 Metals + Misc. Elements

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LB-Pit	1911996-004A	Soil	11/21/2019 12:08	ICP-MS3 075SMPL.D	189281

Analytes	Result	RL	DF	Date Analyzed
Aluminum	15,000	500	10	11/22/2019 16:34
Antimony	ND	0.50	1	11/22/2019 15:14
Arsenic	5.0	0.50	1	11/22/2019 15:14
Barium	110	5.0	1	11/22/2019 15:14
Beryllium	ND	0.50	1	11/22/2019 15:14
Cadmium	ND	0.25	1	11/22/2019 15:14
Chromium	49	0.50	1	11/22/2019 15:14
Cobalt	8.3	0.50	1	11/22/2019 15:14
Copper	24	0.50	1	11/22/2019 15:14
Lead	4.7	0.50	1	11/22/2019 15:14
Mercury	0.064	0.050	1	11/22/2019 15:14
Molybdenum	ND	0.50	1	11/22/2019 15:14
Nickel	79	0.50	1	11/22/2019 15:14
Selenium	ND	0.50	1	11/22/2019 15:14
Silver	ND	0.50	1	11/22/2019 15:14
Thallium	ND	0.50	1	11/22/2019 15:14
Vanadium	34	0.50	1	11/22/2019 15:14
Zinc	41	5.0	1	11/22/2019 15:14

Surrogates	REC (%)	Limits	
Terbium	111	70-130	11/22/2019 15:14

Analyst(s): ND



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/21/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg

CAM / CCR 17 Metals + Misc. Elements

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LB-TopCon	1911996-005A	Soil	11/21/2019 10:07	ICP-MS3 076SMPL.D	189281

Analytes	Result	RL	DF	Date Analyzed
Aluminum	20,000	500	10	11/22/2019 16:40
Antimony	0.57	0.50	1	11/22/2019 15:20
Arsenic	7.0	0.50	1	11/22/2019 15:20
Barium	220	5.0	1	11/22/2019 15:20
Beryllium	0.50	0.50	1	11/22/2019 15:20
Cadmium	ND	0.25	1	11/22/2019 15:20
Chromium	84	0.50	1	11/22/2019 15:20
Cobalt	11	0.50	1	11/22/2019 15:20
Copper	29	0.50	1	11/22/2019 15:20
Lead	9.0	0.50	1	11/22/2019 15:20
Mercury	ND	0.050	1	11/22/2019 15:20
Molybdenum	ND	0.50	1	11/22/2019 15:20
Nickel	89	0.50	1	11/22/2019 15:20
Selenium	ND	0.50	1	11/22/2019 15:20
Silver	ND	0.50	1	11/22/2019 15:20
Thallium	ND	0.50	1	11/22/2019 15:20
Vanadium	59	0.50	1	11/22/2019 15:20
Zinc	61	5.0	1	11/22/2019 15:20

Surrogates	REC (%)	Limits	
Terbium	118	70-130	11/22/2019 15:20

Analyst(s): ND

(Cont.)



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/21/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg

CAM / CCR 17 Metals + Misc. Elements

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LB-ADVBerm	1911996-006A	Soil	11/21/2019 10:21	ICP-MS3 077SMPL.D	189281

Analytes	Result	RL	DF	Date Analyzed
Aluminum	21,000	500	10	11/22/2019 16:46
Antimony	0.60	0.50	1	11/22/2019 15:26
Arsenic	7.5	0.50	1	11/22/2019 15:26
Barium	240	5.0	1	11/22/2019 15:26
Beryllium	0.54	0.50	1	11/22/2019 15:26
Cadmium	ND	0.25	1	11/22/2019 15:26
Chromium	95	0.50	1	11/22/2019 15:26
Cobalt	14	0.50	1	11/22/2019 15:26
Copper	30	0.50	1	11/22/2019 15:26
Lead	11	0.50	1	11/22/2019 15:26
Mercury	0.096	0.050	1	11/22/2019 15:26
Molybdenum	ND	0.50	1	11/22/2019 15:26
Nickel	110	0.50	1	11/22/2019 15:26
Selenium	ND	0.50	1	11/22/2019 15:26
Silver	ND	0.50	1	11/22/2019 15:26
Thallium	ND	0.50	1	11/22/2019 15:26
Vanadium	54	0.50	1	11/22/2019 15:26
Zinc	65	5.0	1	11/22/2019 15:26

Surrogates	REC (%)	Limits	
Terbium	115	70-130	11/22/2019 15:26

Analyst(s): ND



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/21/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg

CAM / CCR 17 Metals + Misc. Elements

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LA-Pipe	1911996-007A	Soil	11/21/2019 10:50	ICP-MS3 078SMPL.D	189281

Analytes	Result	RL	DF	Date Analyzed
Aluminum	21,000	500	10	11/22/2019 16:52
Antimony	0.57	0.50	1	11/22/2019 15:32
Arsenic	7.7	0.50	1	11/22/2019 15:32
Barium	190	5.0	1	11/22/2019 15:32
Beryllium	0.55	0.50	1	11/22/2019 15:32
Cadmium	ND	0.25	1	11/22/2019 15:32
Chromium	80	0.50	1	11/22/2019 15:32
Cobalt	14	0.50	1	11/22/2019 15:32
Copper	30	0.50	1	11/22/2019 15:32
Lead	9.8	0.50	1	11/22/2019 15:32
Mercury	0.054	0.050	1	11/22/2019 15:32
Molybdenum	ND	0.50	1	11/22/2019 15:32
Nickel	100	0.50	1	11/22/2019 15:32
Selenium	ND	0.50	1	11/22/2019 15:32
Silver	ND	0.50	1	11/22/2019 15:32
Thallium	ND	0.50	1	11/22/2019 15:32
Vanadium	53	0.50	1	11/22/2019 15:32
Zinc	62	5.0	1	11/22/2019 15:32

Surrogates	REC (%)	Limits	
Terbium	119	70-130	11/22/2019 15:32

Analyst(s): ND

(Cont.)



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/21/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg

CAM / CCR 17 Metals + Misc. Elements

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LA-Stockpile	1911996-008A	Soil	11/21/2019 11:04	ICP-MS3 079SMPL.D	189281

Analytes	Result	RL	DF	Date Analyzed
Aluminum	16,000	500	10	11/22/2019 16:58
Antimony	0.54	0.50	1	11/22/2019 15:38
Arsenic	6.4	0.50	1	11/22/2019 15:38
Barium	160	5.0	1	11/22/2019 15:38
Beryllium	ND	0.50	1	11/22/2019 15:38
Cadmium	ND	0.25	1	11/22/2019 15:38
Chromium	78	0.50	1	11/22/2019 15:38
Cobalt	12	0.50	1	11/22/2019 15:38
Copper	29	0.50	1	11/22/2019 15:38
Lead	19	0.50	1	11/22/2019 15:38
Mercury	0.065	0.050	1	11/22/2019 15:38
Molybdenum	ND	0.50	1	11/22/2019 15:38
Nickel	95	0.50	1	11/22/2019 15:38
Selenium	ND	0.50	1	11/22/2019 15:38
Silver	ND	0.50	1	11/22/2019 15:38
Thallium	ND	0.50	1	11/22/2019 15:38
Vanadium	46	0.50	1	11/22/2019 15:38
Zinc	66	5.0	1	11/22/2019 15:38

Surrogates	REC (%)	Limits	
Terbium	126	70-130	11/22/2019 15:38

Analyst(s): ND



Analytical Report

Client: Compass Land Group
Date Received: 11/21/19 14:24
Date Prepared: 11/21/19
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg

CAM / CCR 17 Metals + Misc. Elements

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
LA-DivStr	1911996-009A	Soil	11/21/2019 11:23	ICP-MS3 080SMPL.D	189281
<u>Analytes</u>	<u>Result</u>		<u>RL</u> <u>DF</u>		<u>Date Analyzed</u>
Aluminum	19,000		500 10		11/22/2019 17:04
Antimony	ND		0.50 1		11/22/2019 15:44
Arsenic	6.9		0.50 1		11/22/2019 15:44
Barium	140		5.0 1		11/22/2019 15:44
Beryllium	ND		0.50 1		11/22/2019 15:44
Cadmium	ND		0.25 1		11/22/2019 15:44
Chromium	85		0.50 1		11/22/2019 15:44
Cobalt	11		0.50 1		11/22/2019 15:44
Copper	29		0.50 1		11/22/2019 15:44
Lead	6.3		0.50 1		11/22/2019 15:44
Mercury	0.078		0.050 1		11/22/2019 15:44
Molybdenum	ND		0.50 1		11/22/2019 15:44
Nickel	110		0.50 1		11/22/2019 15:44
Selenium	ND		0.50 1		11/22/2019 15:44
Silver	ND		0.50 1		11/22/2019 15:44
Thallium	ND		0.50 1		11/22/2019 15:44
Vanadium	42		0.50 1		11/22/2019 15:44
Zinc	49		5.0 1		11/22/2019 15:44
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
Terbium	111		70-130		11/22/2019 15:44
<u>Analyst(s):</u> ND					



Quality Control Report

Client: Compass Land Group
Date Prepared: 11/22/19
Date Analyzed: 11/25/19
Instrument: IC2
Matrix: Soil
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
BatchID: 189426
Extraction Method: SW3060A
Analytical Method: SW7199
Unit: mg/Kg
Sample ID: MB/LCS/LCSD-189426

QC Summary Report for SW7199 (Hexavalent chromium)

Analyte	MB Result	MDL	RL			
Hexavalent chromium	ND	0.20	0.20	-	-	-

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Hexavalent chromium	4.1	3.9	4	102	99	70-130	3.09	10



Quality Control Report

Client: Compass Land Group
Date Prepared: 11/21/19
Date Analyzed: 11/22/19
Instrument: ICP-MS2, ICP-MS4
Matrix: Soil
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
BatchID: 189281
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg
Sample ID: MB/LCS/LCSD-189281

QC Summary Report for Metals

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Aluminum	ND	3.6	50	-	-	-
Antimony	ND	0.094	0.50	-	-	-
Arsenic	ND	0.14	0.50	-	-	-
Barium	ND	0.97	5.0	-	-	-
Beryllium	ND	0.072	0.50	-	-	-
Cadmium	ND	0.058	0.25	-	-	-
Chromium	ND	0.092	0.50	-	-	-
Cobalt	ND	0.056	0.50	-	-	-
Copper	ND	0.069	0.50	-	-	-
Lead	ND	0.094	0.50	-	-	-
Mercury	ND	0.0050	0.050	-	-	-
Molybdenum	ND	0.23	0.50	-	-	-
Nickel	ND	0.072	0.50	-	-	-
Selenium	ND	0.13	0.50	-	-	-
Silver	ND	0.055	0.50	-	-	-
Thallium	ND	0.10	0.50	-	-	-
Vanadium	ND	0.064	0.50	-	-	-
Zinc	ND	1.4	5.0	-	-	-
Surrogate Recovery						
Terbium	540			500	108	70-130

(Cont.)



Quality Control Report

Client: Compass Land Group
Date Prepared: 11/21/19
Date Analyzed: 11/22/19
Instrument: ICP-MS2, ICP-MS4
Matrix: Soil
Project: Eliot Metals Soil Sampling

WorkOrder: 1911996
BatchID: 189281
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg
Sample ID: MB/LCS/LCSD-189281

QC Summary Report for Metals

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Aluminum	510	520	500	103	104	75-125	0.870	20
Antimony	47	47	50	94	95	75-125	0.614	20
Arsenic	49	50	50	99	100	75-125	1.07	20
Barium	500	500	500	101	101	75-125	0	20
Beryllium	51	52	50	103	104	75-125	1.02	20
Cadmium	50	49	50	100	99	75-125	1.55	20
Chromium	52	52	50	104	104	75-125	0	20
Cobalt	50	51	50	101	102	75-125	0.830	20
Copper	50	50	50	101	100	75-125	1.24	20
Lead	49	49	50	99	98	75-125	0.0609	20
Mercury	1.2	1.2	1.25	95	98	75-125	3.15	20
Molybdenum	48	48	50	96	96	75-125	0	20
Nickel	50	51	50	100	101	75-125	0.655	20
Selenium	49	49	50	98	99	75-125	1.26	20
Silver	45	45	50	89	90	75-125	0.313	20
Thallium	46	46	50	92	91	75-125	0.634	20
Vanadium	52	52	50	104	104	75-125	0	20
Zinc	490	490	500	98	97	75-125	0.390	20
Surrogate Recovery								
Terbium	530	530	500	107	107	70-130	0	20



1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

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CHAIN-OF-CUSTODY RECORD

Page 1 of 1

WorkOrder: 1911996

ClientCode: CLGMP

QuoteID: 193311

☐ Excel ☐ EQuIS ☐ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag
☐ Detection Summary ☐ Dry-Weight

Report to:

Yasha Saber
Compass Land Group
3140 Peacekeeper Way #102
McClellan Park, CA 95652
(916) 825-4997 FAX:

Email: ysaber@compassland.net
cc/3rd Party: sage@compassland.net;
PO: 012
Project: Eliot Metals Soil Sampling

Bill to:

Accounts Payable
Compass Land Group
3140 Peacekeeper Way #102
McClellan Park, 95652
ysaber@compassland.net

Requested TAT: 5 days;

Date Received: 11/21/2019

Date Logged: 11/21/2019

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
1911996-001	NRA-Plant	Soil	11/21/2019 12:45	<input type="checkbox"/>	A	A	A	A								
1911996-002	NRA-Pond	Soil	11/21/2019 13:02	<input type="checkbox"/>	A	A	A	A								
1911996-003	NRA-Stockpile	Soil	11/21/2019 12:26	<input type="checkbox"/>	A	A	A	A								
1911996-004	LB-Pit	Soil	11/21/2019 12:08	<input type="checkbox"/>	A	A	A	A								
1911996-005	LB-TopCon	Soil	11/21/2019 10:07	<input type="checkbox"/>	A	A	A	A								
1911996-006	LB-ADV Berm	Soil	11/21/2019 10:21	<input type="checkbox"/>	A	A	A	A								
1911996-007	LA-Pipe	Soil	11/21/2019 10:50	<input type="checkbox"/>	A	A	A	A								
1911996-008	LA-Stockpile	Soil	11/21/2019 11:04	<input type="checkbox"/>	A	A	A	A								
1911996-009	LA-DivStr	Soil	11/21/2019 11:23	<input type="checkbox"/>	A	A	A	A								

Test Legend:

1	7199_TTLC_LL_S
5	
9	

2	CAMMETMS_TTLC_S
6	
10	

3	PRDisposal Fee
7	
11	

4	XRD ANALYSIS_SOLID
8	
12	

Project Manager: Angela Rydelius

Prepared by: Lilly Ortiz

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.



McC Campbell Analytical, Inc.

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1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mcccampbell.com / E-mail: main@mcccampbell.com

WORK ORDER SUMMARY

Client Name: COMPASS LAND GROUP

Project: Eliot Metals Soil Sampling

Work Order: 1911996

Client Contact: Yasha Saber

QC Level:

Contact's Email: ysaber@compassland.net

Comments:

Date Logged: 11/21/2019

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ EQUIS ☐ Email ☐ HardCopy ☐ ThirdParty ☒ J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De- chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1911996-001A	NRA-Plant	Soil	XRD Analysis	1	16OZ GJ, Unpres	<input type="checkbox"/>	11/21/2019 12:45	5 days		<input type="checkbox"/>	
			SW6020 (Metals) <Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc>			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
			SW7199 (Hexavalent chromium, Low- Level)			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
1911996-002A	NRA-Pond	Soil	XRD Analysis	1	16OZ GJ, Unpres	<input type="checkbox"/>	11/21/2019 13:02	5 days		<input type="checkbox"/>	
			SW6020 (Metals) <Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc>			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
			SW7199 (Hexavalent chromium, Low- Level)			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
1911996-003A	NRA-Stockpile	Soil	XRD Analysis	1	16OZ GJ, Unpres	<input type="checkbox"/>	11/21/2019 12:26	5 days		<input type="checkbox"/>	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.



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WORK ORDER SUMMARY

Client Name: COMPASS LAND GROUP

Client Contact: Yasha Saber

Contact's Email: ysaber@compassland.net

Project: Eliot Metals Soil Sampling

Comments:

Work Order: 1911996

QC Level:

Date Logged: 11/21/2019

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ EQUIS ☐ Email ☐ HardCopy ☐ ThirdParty ☒ J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De- chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1911996-003A	NRA-Stockpile	Soil	SW6020 (Metals) <Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc> SW7199 (Hexavalent chromium, Low- Level)	1	16OZ GJ, Unpres	<input type="checkbox"/> <input type="checkbox"/>	11/21/2019 12:26	5 days 5 days		<input type="checkbox"/> <input type="checkbox"/>	
1911996-004A	LB-Pit	Soil	XRD Analysis SW6020 (Metals) <Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc> SW7199 (Hexavalent chromium, Low- Level)	1	16OZ GJ, Unpres	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	11/21/2019 12:08	5 days 5 days		<input type="checkbox"/> <input type="checkbox"/>	
1911996-005A	LB-TopCon	Soil	XRD Analysis SW6020 (Metals) <Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc>	1	16OZ GJ, Unpres	<input type="checkbox"/> <input type="checkbox"/>	11/21/2019 10:07	5 days 5 days		<input type="checkbox"/> <input type="checkbox"/>	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

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WORK ORDER SUMMARY

Client Name: COMPASS LAND GROUP

Project: Eliot Metals Soil Sampling

Work Order: 1911996

Client Contact: Yasha Saber

QC Level:

Contact's Email: ysaber@compassland.net

Comments:

Date Logged: 11/21/2019

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ EQUIS ☐ Email ☐ HardCopy ☐ ThirdParty ☒ J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De- chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1911996-005A	LB-TopCon	Soil	SW7199 (Hexavalent chromium, Low-Level)	1	16OZ GJ, Unpres	<input type="checkbox"/>	11/21/2019 10:07	5 days		<input type="checkbox"/>	
1911996-006A	LB-ADV Berm	Soil	XRD Analysis	1	16OZ GJ, Unpres	<input type="checkbox"/>	11/21/2019 10:21	5 days		<input type="checkbox"/>	
			SW6020 (Metals) <Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc>			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
			SW7199 (Hexavalent chromium, Low-Level)			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
1911996-007A	LA-Pipe	Soil	XRD Analysis	1	16OZ GJ, Unpres	<input type="checkbox"/>	11/21/2019 10:50	5 days		<input type="checkbox"/>	
			SW6020 (Metals) <Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc>			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
			SW7199 (Hexavalent chromium, Low-Level)			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
1911996-008A	LA-Stockpile	Soil	XRD Analysis	1	16OZ GJ, Unpres	<input type="checkbox"/>	11/21/2019 11:04	5 days		<input type="checkbox"/>	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

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WORK ORDER SUMMARY

Client Name: COMPASS LAND GROUP

Client Contact: Yasha Saber

Contact's Email: ysaber@compassland.net

Project: Eliot Metals Soil Sampling

Comments:

Work Order: 1911996

QC Level:

Date Logged: 11/21/2019

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ EQUIS ☐ Email ☐ HardCopy ☐ ThirdParty ☒ J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De- chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1911996-008A	LA-Stockpile	Soil	SW6020 (Metals) <Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc> SW7199 (Hexavalent chromium, Low- Level)	1	16OZ GJ, Unpres	<input type="checkbox"/> <input type="checkbox"/>	11/21/2019 11:04	5 days 5 days		<input type="checkbox"/> <input type="checkbox"/>	
1911996-009A	LA-DivStr	Soil	XRD Analysis SW6020 (Metals) <Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc> SW7199 (Hexavalent chromium, Low- Level)	1	16OZ GJ, Unpres	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	11/21/2019 11:23	5 days 5 days		<input type="checkbox"/> <input type="checkbox"/>	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

1911996



McCAMPBELL ANALYTICAL, INC.

1534 Willow Pass Rd. Pittsburg, Ca. 94565-1701

Telephone: (877) 252-9262 / Fax: (925) 252-9269

www.mccampbell.com
main@mccampbell.com

CHAIN OF CUSTODY RECORD

Turn Around Time: 1 Day Rush	2 Day Rush	3 Day Rush	STD	X	Quote #	193311
J-Flag / MDL	ESL	Cleanup Approved	Dry Weight	Bottle Order #		
Delivery Format: PDF	GeoTracker EDF	EDD	Write On (DW)	Detect Summary		

Report To: Yasha Saber; Sage Thurmond	Bill To: Yasha Saber
Company: Compass Land Group	
Email: ysaber@compassland.net	
Alt Email: sage@compassland.net	Tele: (916) 767-1602
Project Name: Eliot Metals Soil Sampling	Project #:
Project Location: 1544 Stanley Blvd, Pleasanton	PO # 012
Sampler Signature: <i>[Signature]</i>	

Analysis Requested

Company: Compass Land Group						XRD Analysis (Crystalline Silica) USGS 01041	SW7199 (Hexavalent chromium, Low-Level)	SW6020 (Metals)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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MAI clients MUST disclose any dangerous chemicals known to be present in their submitted samples in concentrations that may cause immediate harm or serious future health endangerment as a result of brief, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate \$250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding and for allowing us to work safely.

* If metals are requested for water samples and the water type (Matrix) is not specified on the chain of custody, MAI will default to metals by E200.8.

Please provide an adequate volume of sample. If the volume is not sufficient for a MS/MSD a LCS/LCSD will be prepared in its place and noted in the report.

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
<i>[Signature]</i> CLG	11-21-19	14:24	Nancy Palacios	11-21-19	14:24

Comments / Instructions

* Set upper quote

Matrix Code: DW=Drinking Water, GW=Ground Water, WW=Waste Water, SW=Seawater, S=Soil, SL=Sludge, A=Air, WP=Wipe, O=Other

Preservative Code: 1=4°C 2=HCl 3=H₂SO₄ 4=HNO₃ 5=NaOH 6=ZnOAc/NaOH 7=None

Temp *D. Hart* °C Initials *JS*



Sample Receipt Checklist

Client Name: **Compass Land Group**
Project: **Eliot Metals Soil Sampling**

Date and Time Received: **11/21/2019 14:24**

Date Logged: **11/21/2019**

Received by: **Nancy Palacios**

Logged by: **Lilly Ortiz**

WorkOrder No: **1911996** Matrix: Soil
Carrier: Client Drop-In

Chain of Custody (COC) Information

Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample IDs noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Date and Time of collection noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sampler's name noted on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
COC agrees with Quote?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper containers/bottles?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Samples Received on Ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

(Ice Type: WET ICE)

Sample/Temp Blank temperature	Temp: 0.4°C	NA <input type="checkbox"/>
Water - VOA vials have zero headspace / no bubbles?	Yes <input type="checkbox"/> No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Sample labels checked for correct preservation?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
pH acceptable upon receipt (Metal: <2; Nitrate 353.2/4500NO3: <2; 522: <4; 218.7: >8)?	Yes <input type="checkbox"/> No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

UCMR Samples:

pH tested and acceptable upon receipt (200.8: ≤2; 525.3: ≤4; 530: ≤7; 541: <3; 544: <6.5 & 7.5)?	Yes <input type="checkbox"/> No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Free Chlorine tested and acceptable upon receipt (<0.1mg/L)?	Yes <input type="checkbox"/> No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Comments:



McC Campbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1911996 A

Report Created for: Compass Land Group

3140 Peacekeeper Way #102
McClellan Park, CA 95652

Project Contact: Yasha Saber

Project P.O.: 012

Project: Eliot Metals Soil Sampling

Project Received: 11/21/2019

Analytical Report reviewed & approved for release on 12/06/2019 by:

Christine Askari
Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.





Glossary of Terms & Qualifier Definitions

Client: Compass Land Group
Project: Eliot Metals Soil Sampling
WorkOrder: 1911996 A

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
LQL	Lowest Quantitation Level
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
TZA	TimeZone Net Adjustment for sample collected outside of MAI's UTC.
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)



Bulk Crystalline Silica Analysis by Modified NIOSH 7602 Method, Issue 4, 2017

[MAI ID 1911996-001A to -009A]

Report prepared by Kelly Chen

McC Campbell Analytical received samples 1911996-001A to -009A for bulk crystalline silica analysis by a modified NIOSH 7602 method on 11/21/2019. A table of the client and laboratory sample IDs is listed in Table 1.

Client ID	Lab ID
NRA-Plant	1911996-001A
NRA-Pond	1911996-002A
NRA-Stockpile	1911996-003A
LB-Pit	1911996-004A
LB-TopCon	1911996-005A
LB-ADV Berm	1911996-006A
LA-Pipe	1911996-007A
LA-Stockpile	1911996-008A
LA-DivStr	1911996-009A

Table 1. Client and lab sample IDs.

Samples 1911996-001A to -009A were prepared and analyzed according to the NIOSH 7602 method with the following modifications. The soil samples were ground using a Bico plate mill and passed through a No. 500 (25 μm) sieve. 1mg of sample was mixed with 299mg FTIR Grade KBr using an agate mortar and pestle. The KBr pellet was prepared as described in the published method. FTIR analysis was performed using a ABB MB3000 FTIR spectrometer. The modified quartz calibration was based on the peak at 694 cm^{-1} due to interferences present at the major peak at 800 cm^{-1} . The cristobalite calibration was based on the peak at 623 cm^{-1} . Table 1 of the published method lists characteristic peaks associated with silica polymorphs and various interferences.

The crystalline silica content of the bulk soil samples are listed in Table 2. The results are calculated based on the initial 1mg sample amount used. The minimum detection limits (MDL) for quartz and cristobalite are 0.5% and 0.3%, respectively. However, the MDL for quartz is based on calibration at the 800 cm^{-1} peak.



Sample	Quartz weight %	Cristobalite weight %
1911996-001A	12.6	ND
1911996-002A	8.6	ND
1911996-003A	12.8	ND
1911996-004A	16.0	ND
1911996-005A	12.3	ND
1911996-006A	11.3	ND
1911996-007A	11.5	ND
1911996-008A	11.4	ND
1911996-009A	13.6	ND

Table 2. Crystalline silica weight % of samples 1911996-001A to -009A. ND = not detected.



1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

☐ WaterTrax ☐ WriteOn ☐ EDF

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

WorkOrder: 1911996 **A** ClientCode: CLGMP QuoteID: 193311

☐ Excel ☐ EQUIS ☐ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag
☐ Detection Summary ☐ Dry-Weight

Report to:

Yasha Saber
Compass Land Group
3140 Peacekeeper Way #102
McClellan Park, CA 95652
(916) 825-4997 FAX:

Email: ysaber@compassland.net
cc/3rd Party: sage@compassland.net;
PO: 012
Project: Eliot Metals Soil Sampling

Bill to:

Accounts Payable
Compass Land Group
3140 Peacekeeper Way #102
McClellan Park, 95652
ysaber@compassland.net

Requested TAT: 5 days;

Date Received: 11/21/2019

Date Logged: 11/21/2019

Date Add-On: 12/05/2019

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
1911996-001	NRA-Plant	Soil	11/21/2019 12:45	<input type="checkbox"/>	A											
1911996-002	NRA-Pond	Soil	11/21/2019 13:02	<input type="checkbox"/>	A											
1911996-003	NRA-Stockpile	Soil	11/21/2019 12:26	<input type="checkbox"/>	A											
1911996-004	LB-Pit	Soil	11/21/2019 12:08	<input type="checkbox"/>	A											
1911996-005	LB-TopCon	Soil	11/21/2019 10:07	<input type="checkbox"/>	A											
1911996-007	LA-Pipe	Soil	11/21/2019 10:50	<input type="checkbox"/>	A											
1911996-008	LA-Stockpile	Soil	11/21/2019 11:04	<input type="checkbox"/>	A											
1911996-009	LA-DivStr	Soil	11/21/2019 11:23	<input type="checkbox"/>	A											

Test Legend:

1	FTIR_ANALYSIS_SOLID
5	
9	

2	
6	
10	

3	
7	
11	

4	
8	
12	

Project Manager: Angela Rydelius

Prepared by: Lilly Ortiz

Add-On Prepared By: Maria Venegas

Comments: FTIR added to all samples 12/5/19 Rush TAT

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.



McC Campbell Analytical, Inc.

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

WORK ORDER SUMMARY

Client Name: COMPASS LAND GROUP

Client Contact: Yasha Saber

Contact's Email ysaber@compassland.net

Project: Eliot Metals Soil Sampling

Comments: FTIR added to all samples 12/5/19 Rush TAT

Work Order: 1911996

QC Level:

Date Logged: 11/21/2019

Date Add-On: 12/5/2019

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1911996-001A	NRA-Plant	Soil	FTIR Analysis	1	16OZ GJ, Unpres	11/21/2019 12:45	5 days		<input type="checkbox"/>	
1911996-002A	NRA-Pond	Soil	FTIR Analysis	1	16OZ GJ, Unpres	11/21/2019 13:02	5 days		<input type="checkbox"/>	
1911996-003A	NRA-Stockpile	Soil	FTIR Analysis	1	16OZ GJ, Unpres	11/21/2019 12:26	5 days		<input type="checkbox"/>	
1911996-004A	LB-Pit	Soil	FTIR Analysis	1	16OZ GJ, Unpres	11/21/2019 12:08	5 days		<input type="checkbox"/>	
1911996-005A	LB-TopCon	Soil	FTIR Analysis	1	16OZ GJ, Unpres	11/21/2019 10:07	5 days		<input type="checkbox"/>	
1911996-007A	LA-Pipe	Soil	FTIR Analysis	1	16OZ GJ, Unpres	11/21/2019 10:50	5 days		<input type="checkbox"/>	
1911996-008A	LA-Stockpile	Soil	FTIR Analysis	1	16OZ GJ, Unpres	11/21/2019 11:04	5 days		<input type="checkbox"/>	
1911996-009A	LA-DivStr	Soil	FTIR Analysis	1	16OZ GJ, Unpres	11/21/2019 11:23	5 days		<input type="checkbox"/>	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

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Page 7 of 7

Appendix D
HARP Model Excerpts
June 17, 2020



Screenshot of Emissions Inventory

Emission Inventory									
Add Import Export Delete All Options Filter: All ▾ All ▾									
	SrcID	StkID	ProID	PolID	PolAbbrev	Multiplier	Annual Ems (lbs/yr)	Max Hr Ems (lbs/hr)	MWAF
▶	AREA_A	0	0	9901	DieselExhPM	1	4.066	0	1
	LAKEB	0	0	9901	DieselExhPM	1	14.68	0	1
	NORTH	0	0	9901	DieselExhPM	1	1.058	0	1
	AREA_A	0	0	1175	Silica, Crystln	1	29.16	2.9	1
	LAKEB	0	0	1175	Silica, Crystln	1	19.72	2.18	1
	NORTH	0	0	1175	Silica, Crystln	1	10	0.36	1
	NORTH	0	0	7429905	Aluminum	1	3.47	0.0188	1
	NORTH	0	0	7440360	Antimony	1	3.73E-05	2.02E-07	1
	NORTH	0	0	7440382	Arsenic	1	0.001	5.42E-06	1
	NORTH	0	0	7440393	Barium	1	0.034	0.000184	1
	NORTH	0	0	7440417	Beryllium	1	0	0	1
	NORTH	0	0	7440473	Chromium	1	0.0116	6.29E-05	1
	NORTH	0	0	7440484	Cobalt	1	0.00173	9.39E-06	1
	NORTH	0	0	7440508	Copper	1	0.00447	2.42E-05	1
	NORTH	0	0	7439921	Lead	1	0.0015	8.13E-06	1
	NORTH	0	0	7439976	Mercury	1	0	0	1
	NORTH	0	0	7440020	Nickel	1	0.0129	7.01E-05	1
	NORTH	0	0	7440622	Vanadium	1	0.00913	4.95E-05	1
	NORTH	0	0	7440666	Zinc	1	0.00873	4.73E-05	1
	LAKEB	0	0	7429905	Aluminum	1	6.35	0.122	1
	LAKEB	0	0	7440360	Antimony	1	0.000133	2.56E-06	1
	LAKEB	0	0	7440382	Arsenic	1	0.00221	4.26E-05	1
	LAKEB	0	0	7440393	Barium	1	0.0646	0.00125	1
	LAKEB	0	0	7440417	Beryllium	1	0.000118	2.27E-06	1
	LAKEB	0	0	7440473	Chromium	1	0.0258	0.000498	1
	LAKEB	0	0	7440484	Cobalt	1	0.00377	7.27E-05	1

Screenshot of Emissions Inventory (Continued)

Emission Inventory									
Add	Import	Export	Delete All	Options	Filter:	All	All	All	
	SrcID	StkID	ProID	PolID	PolAbbrev	Multiplier	Annual Ems (lbs/yr)	Max Hr Ems (lbs/hr)	MWAF
	LAKEB	0	0	7440360	Antimony	1	0.000133	2.56E-06	1
	LAKEB	0	0	7440382	Arsenic	1	0.00221	4.26E-05	1
	LAKEB	0	0	7440393	Barium	1	0.0646	0.00125	1
	LAKEB	0	0	7440417	Beryllium	1	0.000118	2.27E-06	1
	LAKEB	0	0	7440473	Chromium	1	0.0258	0.000498	1
	LAKEB	0	0	7440484	Cobalt	1	0.00377	7.27E-05	1
	LAKEB	0	0	7440508	Copper	1	0.00941	0.000181	1
	LAKEB	0	0	7439921	Lead	1	0.0028	5.4E-05	1
	LAKEB	0	0	7439976	Mercury	1	1.81E-05	3.5E-07	1
	LAKEB	0	0	7440020	Nickel	1	0.0315	0.000607	1
	LAKEB	0	0	7440622	Vanadium	1	0.0167	0.000321	1
	LAKEB	0	0	7440666	Zinc	1	0.0189	0.000365	1
	AREA_A	0	0	7429905	Aluminum	1	10.1	1.3	1
	AREA_A	0	0	7440360	Antimony	1	0.00139	0.000179	1
	AREA_A	0	0	7440382	Arsenic	1	0.0277	0.00358	1
	AREA_A	0	0	7440393	Barium	1	0.0882	0.0114	1
	AREA_A	0	0	7440417	Beryllium	1	9.9E-05	1.28E-05	1
	AREA_A	0	0	7440473	Chromium	1	0.0437	0.00564	1
	AREA_A	0	0	7440508	Copper	1	0.0158	0.00204	1
	AREA_A	0	0	7439921	Lead	1	0.00632	0.000815	1
	AREA_A	0	0	7439976	Mercury	1	3.55E-05	4.57E-06	1
	AREA_A	0	0	7440020	Nickel	1	0.0459	0.00708	1
	AREA_A	0	0	7440622	Vanadium	1	0.0254	0.00327	1
	AREA_A	0	0	7440666	Zinc	1	0.0319	0.00411	1
	AREA_A	0	0	7440484	Cobalt	1	0.00666	0.000859	1
	LAKEB	0	0	18540299	Cr(VI)	1	4.99E-05	5.69E-09	1

Screenshot of Exposure Pathways for Cancer Risk Evaluation

Select Pathways to Evaluate and Define Site Parameters

Pathways to Evaluate ■ Inh ■ Soil ■ Derm ■ MMilk ■ Drink Water ■ Fish ■ HG Produce ■ Beef & Dairy

☐ Inhalation Only
☒ **Mandatory Minimum Pathways**
☐ Worker Pathways
☐ User Defined

☒ Inhalation (Always On)
☐ Soil Ingestion
☐ Dermal
☐ Mother's Milk
☐ Drinking Water
☐ Fish
☐ Homegrown Produce
☐ Beef
☐ Dairy Cows
☐ Pigs
☐ Chickens
☐ Eggs

Deposition Rate (for noninhalation pathways only)
☒ 0.05 m/s (uncontrolled sources)
☐ 0.02 m/s (controlled sources)
☐ Other

Advanced Options (Tier 2) - For noninhalation pathways only
☐ Change exposure frequency (days/year): [What's this do?](#)

[Help me choose](#)
[Click to select SCAQMD mandatory minimum pathways](#)

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Screenshot of Plot Files

List of PLOTFILES to Convert			
Add Import			
	Source ID	PERIOD File	Max 1-Hr File
	AREA_A	C:\Users\Owner\Documents\2020 HARP Runs\ELIOT20\ELIOT20.AD\PE00G001.PLT	C:\Users\Owner\Documents\2020 HARP Runs\
	LAKEB	C:\Users\Owner\Documents\2020 HARP Runs\ELIOT20\ELIOT20.AD\PE00G002.PLT	C:\Users\Owner\Documents\2020 HARP Runs\
▶	NORTH	C:\Users\Owner\Documents\2020 HARP Runs\ELIOT20\ELIOT20.AD\PE00G003.PLT	C:\Users\Owner\Documents\2020 HARP Runs\

Screenshot of Cancer Risk By Receptor

View Risk Results							
Cancer Chronic 8-hour Acute							
Load File Risk Views Options Export							
	REC	GRP	NETID	X	Y	RISK_SUM	SCENARIO
▶	1	ALL	UCART1	602440	4166420	1.0200e-08	30YrCancerDerived_Inh
	2	ALL	UCART1	602515	4166420	9.3651e-09	30YrCancerDerived_Inh
	3	ALL	UCART1	602590	4166420	1.1170e-08	30YrCancerDerived_Inh
	4	ALL	UCART1	602665	4166420	9.2040e-09	30YrCancerDerived_Inh
	5	ALL	UCART1	602740	4166420	9.0967e-09	30YrCancerDerived_Inh
	6	ALL	UCART1	602815	4166420	1.0628e-08	30YrCancerDerived_Inh
	7	ALL	UCART1	602890	4166420	1.1457e-08	30YrCancerDerived_Inh
	8	ALL	UCART1	602965	4166420	1.1305e-08	30YrCancerDerived_Inh
	9	ALL	UCART1	603040	4166420	9.5690e-09	30YrCancerDerived_Inh
	10	ALL	UCART1	603115	4166420	8.2675e-09	30YrCancerDerived_Inh
	11	ALL	UCART1	603190	4166420	8.3433e-09	30YrCancerDerived_Inh
	12	ALL	UCART1	603265	4166420	9.3256e-09	30YrCancerDerived_Inh
	13	ALL	UCART1	603340	4166420	9.2270e-09	30YrCancerDerived_Inh
	14	ALL	UCART1	603415	4166420	9.0005e-09	30YrCancerDerived_Inh
	15	ALL	UCART1	603490	4166420	8.4423e-09	30YrCancerDerived_Inh
	16	ALL	UCART1	603565	4166420	8.2018e-09	30YrCancerDerived_Inh
	17	ALL	UCART1	603640	4166420	8.1118e-09	30YrCancerDerived_Inh
	18	ALL	UCART1	603715	4166420	8.0268e-09	30YrCancerDerived_Inh
	19	ALL	UCART1	603790	4166420	7.7059e-09	30YrCancerDerived_Inh
	20	ALL	UCART1	603865	4166420	7.9747e-09	30YrCancerDerived_Inh
	21	ALL	UCART1	603940	4166420	7.3491e-09	30YrCancerDerived_Inh
	22	ALL	UCART1	604015	4166420	7.2213e-09	30YrCancerDerived_Inh
	23	ALL	UCART1	604090	4166420	7.4495e-09	30YrCancerDerived_Inh
	24	ALL	UCART1	604165	4166420	7.2656e-09	30YrCancerDerived_Inh
	25	ALL	UCART1	604240	4166420	6.8869e-09	30YrCancerDerived_Inh

Screenshot of Cancer Risk By Receptor (Continued)

View Risk Results							
Cancer Chronic 8-hour Acute							
Load File Risk Views Options Export							
	REC	GRP	NETID	X	Y	RISK_SUM	SCENARIO
	8083	ALL	UCART1	607840	4171760	2.0714e-08	30YrCancerDerived_Inh
	8084	ALL	UCART1	607915	4171760	2.0407e-08	30YrCancerDerived_Inh
	8085	ALL	UCART1	607990	4171760	2.0034e-08	30YrCancerDerived_Inh
	8086	ALL	UCART1	608065	4171760	1.9655e-08	30YrCancerDerived_Inh
	8087	ALL	UCART1	608140	4171760	1.9328e-08	30YrCancerDerived_Inh
	8088	ALL	UCART1	608215	4171760	1.8942e-08	30YrCancerDerived_Inh
	8089	ALL	UCART1	608290	4171760	1.8615e-08	30YrCancerDerived_Inh
	8090	ALL	UCART1	608365	4171760	1.8231e-08	30YrCancerDerived_Inh
	8091	ALL	UCART1	608440	4171760	1.7913e-08	30YrCancerDerived_Inh
	8092	ALL	UCART1	608515	4171760	1.7545e-08	30YrCancerDerived_Inh
	8093	ALL	UCART1	608590	4171760	1.7230e-08	30YrCancerDerived_Inh
	8094	ALL	UCART1	608665	4171760	1.6865e-08	30YrCancerDerived_Inh
	8095	ALL	UCART1	608740	4171760	1.6506e-08	30YrCancerDerived_Inh
	8096	ALL	UCART1	608815	4171760	1.6200e-08	30YrCancerDerived_Inh
	8097	ALL	UCART1	608890	4171760	1.5839e-08	30YrCancerDerived_Inh
	8098	ALL	UCART1	608965	4171760	1.5482e-08	30YrCancerDerived_Inh
	8099	ALL	UCART1	609040	4171760	1.5185e-08	30YrCancerDerived_Inh
	8100	ALL	UCART1	609115	4171760	1.4827e-08	30YrCancerDerived_Inh
	8101	ALL		605410	4168336	7.6858e-07	30YrCancerDerived_Inh
	8102	ALL		606909	4170423	3.9120e-08	30YrCancerDerived_Inh
	8103	ALL		607431	4170782	2.9226e-08	30YrCancerDerived_Inh
	8104	ALL		605408	4168358	7.4153e-07	30YrCancerDerived_Inh
	8105	ALL		605406	4168358	7.4774e-07	30YrCancerDerived_Inh
	8106	ALL		605460	4168378	5.8935e-07	30YrCancerDerived_Inh
	8107	ALL		605460	4168344	6.2427e-07	30YrCancerDerived_Inh

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Screenshot of Chronic Hazard Index by Receptor

View Risk Results

Cancer Chronic 8-hour Acute

Load File Risk Views Export

	REC	GRP	NETID	X	Y	SCENARIO	CV
▶	1	ALL	UCART1	602440	4166420	NonCancerChron...	4.0130e-05
	2	ALL	UCART1	602515	4166420	NonCancerChron...	3.8349e-05
	3	ALL	UCART1	602590	4166420	NonCancerChron...	4.6920e-05
	4	ALL	UCART1	602665	4166420	NonCancerChron...	4.1033e-05
	5	ALL	UCART1	602740	4166420	NonCancerChron...	4.2529e-05
	6	ALL	UCART1	602815	4166420	NonCancerChron...	5.1423e-05
	7	ALL	UCART1	602890	4166420	NonCancerChron...	5.7128e-05
	8	ALL	UCART1	602965	4166420	NonCancerChron...	5.9199e-05
	9	ALL	UCART1	603040	4166420	NonCancerChron...	5.4534e-05
	10	ALL	UCART1	603115	4166420	NonCancerChron...	5.0543e-05
	11	ALL	UCART1	603190	4166420	NonCancerChron...	5.3471e-05
	12	ALL	UCART1	603265	4166420	NonCancerChron...	6.1406e-05
	13	ALL	UCART1	603340	4166420	NonCancerChron...	6.3471e-05
	14	ALL	UCART1	603415	4166420	NonCancerChron...	6.5843e-05
	15	ALL	UCART1	603490	4166420	NonCancerChron...	6.5167e-05
	16	ALL	UCART1	603565	4166420	NonCancerChron...	6.7270e-05
	17	ALL	UCART1	603640	4166420	NonCancerChron...	7.1681e-05
	18	ALL	UCART1	603715	4166420	NonCancerChron...	7.6289e-05
	19	ALL	UCART1	603790	4166420	NonCancerChron...	7.6777e-05
	20	ALL	UCART1	603865	4166420	NonCancerChron...	8.5698e-05
	21	ALL	UCART1	603940	4166420	NonCancerChron...	8.0405e-05
	22	ALL	UCART1	604015	4166420	NonCancerChron...	8.2586e-05
	23	ALL	UCART1	604090	4166420	NonCancerChron...	9.0371e-05
	24	ALL	UCART1	604165	4166420	NonCancerChron...	9.1051e-05

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HARP Model Excerpts
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Screenshot of Chronic Hazard Index by Receptor (continued)

View Risk Results

Cancer Chronic 8-hour Acute

Load File Risk Views Export

	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL	MAXHI
	0.0000e+00	0.0000e+00	0.0000e+00	4.8535e-06	0.0000e+00	0.0000e+00	8.7107e-05
	0.0000e+00	0.0000e+00	0.0000e+00	4.7604e-06	0.0000e+00	0.0000e+00	8.5870e-05
	0.0000e+00	0.0000e+00	0.0000e+00	4.6673e-06	0.0000e+00	0.0000e+00	8.4610e-05
	0.0000e+00	0.0000e+00	0.0000e+00	4.5895e-06	0.0000e+00	0.0000e+00	8.3565e-05
	0.0000e+00	0.0000e+00	0.0000e+00	4.4969e-06	0.0000e+00	0.0000e+00	8.2261e-05
	0.0000e+00	0.0000e+00	0.0000e+00	4.4214e-06	0.0000e+00	0.0000e+00	8.1246e-05
	0.0000e+00	0.0000e+00	0.0000e+00	4.3310e-06	0.0000e+00	0.0000e+00	7.9945e-05
	0.0000e+00	0.0000e+00	0.0000e+00	4.2585e-06	0.0000e+00	0.0000e+00	7.8943e-05
	0.0000e+00	0.0000e+00	0.0000e+00	4.1733e-06	0.0000e+00	0.0000e+00	7.7707e-05
	0.0000e+00	0.0000e+00	0.0000e+00	4.1018e-06	0.0000e+00	0.0000e+00	7.6668e-05
	0.0000e+00	0.0000e+00	0.0000e+00	4.0176e-06	0.0000e+00	0.0000e+00	7.5395e-05
	0.0000e+00	0.0000e+00	0.0000e+00	3.9352e-06	0.0000e+00	0.0000e+00	7.4120e-05
	0.0000e+00	0.0000e+00	0.0000e+00	3.8666e-06	0.0000e+00	0.0000e+00	7.3067e-05
	0.0000e+00	0.0000e+00	0.0000e+00	3.7844e-06	0.0000e+00	0.0000e+00	7.1771e-05
	0.0000e+00	0.0000e+00	0.0000e+00	3.7033e-06	0.0000e+00	0.0000e+00	7.0487e-05
	0.0000e+00	0.0000e+00	0.0000e+00	3.6385e-06	0.0000e+00	0.0000e+00	6.9507e-05
	0.0000e+00	0.0000e+00	0.0000e+00	3.5592e-06	0.0000e+00	0.0000e+00	6.8296e-05
	0.0000e+00	0.0000e+00	0.0000e+00	1.4102e-04	0.0000e+00	0.0000e+00	1.8833e-03
	0.0000e+00	0.0000e+00	0.0000e+00	9.3710e-06	0.0000e+00	0.0000e+00	1.6580e-04
	0.0000e+00	0.0000e+00	0.0000e+00	7.0251e-06	0.0000e+00	0.0000e+00	1.2947e-04
	0.0000e+00	0.0000e+00	0.0000e+00	1.3637e-04	0.0000e+00	0.0000e+00	1.8186e-03
	0.0000e+00	0.0000e+00	0.0000e+00	1.3743e-04	0.0000e+00	0.0000e+00	1.8308e-03
	0.0000e+00	0.0000e+00	0.0000e+00	1.1044e-04	0.0000e+00	0.0000e+00	1.5188e-03
▶	0.0000e+00	0.0000e+00	0.0000e+00	1.1647e-04	0.0000e+00	0.0000e+00	1.6057e-03

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HARP Model Excerpts
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Screenshot of Acute Hazard Index by Receptor

View Risk Results							
Cancer Chronic 8-hour Acute							
Load File Risk Views Export							
	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DEVEL	RESP
▶	1.1196e-03	1.1201e-03	2.5184e-03	0.0000e+00	0.0000e+00	1.1201e-03	9.5894e-06
	1.0758e-03	1.0763e-03	2.4293e-03	0.0000e+00	0.0000e+00	1.0763e-03	9.2684e-06
	1.2806e-03	1.2812e-03	2.8660e-03	0.0000e+00	0.0000e+00	1.2812e-03	1.0885e-05
	1.1310e-03	1.1316e-03	2.5441e-03	0.0000e+00	0.0000e+00	1.1316e-03	9.6871e-06
	1.1570e-03	1.1575e-03	2.5889e-03	0.0000e+00	0.0000e+00	1.1575e-03	9.8322e-06
	1.3535e-03	1.3541e-03	3.0201e-03	0.0000e+00	0.0000e+00	1.3541e-03	1.1453e-05
	1.4481e-03	1.4487e-03	3.2482e-03	0.0000e+00	0.0000e+00	1.4487e-03	1.2351e-05
	1.4739e-03	1.4746e-03	3.3083e-03	0.0000e+00	0.0000e+00	1.4746e-03	1.2584e-05
	1.3840e-03	1.3846e-03	3.0869e-03	0.0000e+00	0.0000e+00	1.3846e-03	1.1704e-05
	1.2761e-03	1.2767e-03	2.8467e-03	0.0000e+00	0.0000e+00	1.2767e-03	1.0794e-05
	1.3396e-03	1.3402e-03	2.9845e-03	0.0000e+00	0.0000e+00	1.3402e-03	1.1309e-05
	1.4911e-03	1.4918e-03	3.3191e-03	0.0000e+00	0.0000e+00	1.4918e-03	1.2571e-05
	1.5211e-03	1.5218e-03	3.4400e-03	0.0000e+00	0.0000e+00	1.5218e-03	1.3134e-05
	1.5651e-03	1.5658e-03	3.4998e-03	0.0000e+00	0.0000e+00	1.5658e-03	1.3287e-05
	1.5395e-03	1.5402e-03	3.4388e-03	0.0000e+00	0.0000e+00	1.5402e-03	1.3048e-05
	1.5630e-03	1.5637e-03	3.4911e-03	0.0000e+00	0.0000e+00	1.5637e-03	1.3246e-05
	1.6650e-03	1.6657e-03	3.7098e-03	0.0000e+00	0.0000e+00	1.6657e-03	1.4058e-05
	1.7846e-03	1.7854e-03	3.9662e-03	0.0000e+00	0.0000e+00	1.7854e-03	1.5010e-05
	1.7940e-03	1.7948e-03	3.9846e-03	0.0000e+00	0.0000e+00	1.7948e-03	1.5075e-05
	2.0529e-03	2.0538e-03	4.5395e-03	0.0000e+00	0.0000e+00	2.0538e-03	1.7135e-05
	1.9123e-03	1.9131e-03	4.2372e-03	0.0000e+00	0.0000e+00	1.9131e-03	1.6011e-05
	1.9892e-03	1.9901e-03	4.4018e-03	0.0000e+00	0.0000e+00	1.9901e-03	1.6621e-05
	2.2236e-03	2.2246e-03	4.9069e-03	0.0000e+00	0.0000e+00	2.2246e-03	1.8502e-05
	2.2537e-03	2.2547e-03	4.9698e-03	0.0000e+00	0.0000e+00	2.2547e-03	1.8732e-05
	2.1614e-03	2.1624e-03	4.7721e-03	0.0000e+00	0.0000e+00	2.1624e-03	1.7999e-05

Appendix D
HARP Model Excerpts
June 17, 2020



Screenshot of Acute Hazard Index by Receptor (continued)

View Risk Results

Cancer Chronic 8-hour Acute

Load File Risk Views Export

	REC	GRP	NETID	X	Y	SCENARIO	CV
	8084	ALL	UCART1	607915	4171760	NonCancerAcute	1.9436e-03
	8085	ALL	UCART1	607990	4171760	NonCancerAcute	1.9250e-03
	8086	ALL	UCART1	608065	4171760	NonCancerAcute	1.9071e-03
	8087	ALL	UCART1	608140	4171760	NonCancerAcute	1.9059e-03
	8088	ALL	UCART1	608215	4171760	NonCancerAcute	1.8943e-03
	8089	ALL	UCART1	608290	4171760	NonCancerAcute	1.8880e-03
	8090	ALL	UCART1	608365	4171760	NonCancerAcute	1.8677e-03
	8091	ALL	UCART1	608440	4171760	NonCancerAcute	1.8576e-03
	8092	ALL	UCART1	608515	4171760	NonCancerAcute	1.8386e-03
	8093	ALL	UCART1	608590	4171760	NonCancerAcute	1.8257e-03
	8094	ALL	UCART1	608665	4171760	NonCancerAcute	1.8187e-03
	8095	ALL	UCART1	608740	4171760	NonCancerAcute	1.8105e-03
	8096	ALL	UCART1	608815	4171760	NonCancerAcute	1.7922e-03
	8097	ALL	UCART1	608890	4171760	NonCancerAcute	1.7670e-03
	8098	ALL	UCART1	608965	4171760	NonCancerAcute	1.7590e-03
	8099	ALL	UCART1	609040	4171760	NonCancerAcute	1.7562e-03
	8100	ALL	UCART1	609115	4171760	NonCancerAcute	1.7323e-03
	8101	ALL		605410	4168336	NonCancerAcute	3.0513e-02
	8102	ALL		606909	4170423	NonCancerAcute	2.7469e-03
	8103	ALL		607431	4170782	NonCancerAcute	2.3788e-03
	8104	ALL		605408	4168358	NonCancerAcute	2.7661e-02
	8105	ALL		605406	4168358	NonCancerAcute	2.7755e-02
	8106	ALL		605460	4168378	NonCancerAcute	2.3062e-02
▶	8107	ALL		605460	4168344	NonCancerAcute	2.6394e-02

Screenshot of Worker Cancer Risk Selection

Select Risk Scenario

Analysis Type	Receptor Type
<input checked="" type="radio"/> Cancer Risk	<input type="radio"/> Individual Resident
<input type="radio"/> Chronic Risk (Non-cancer)	<input type="radio"/> Population-Wide
<input type="radio"/> 8-Hour Chronic Risk (Non-cancer)	<input checked="" type="radio"/> Worker
<input type="radio"/> Acute Risk (Non-cancer)	
<input type="radio"/> Cancer, Chronic, and Acute	
Help me choose	Help me choose

Exposure Duration	Intake Rate Percentile
<input type="radio"/> 70 Year	<input checked="" type="radio"/> OEHHA Derived Method
<input type="radio"/> 30 Year	<input type="radio"/> 95th (High End)
<input checked="" type="radio"/> 25 Year (Worker)	<input type="radio"/> 65th (Mean)
<input type="radio"/> 9 Year	<input type="radio"/> Risk Management Policy (RMP) - "Inhalation Only"
<input type="radio"/> User Defined (Tier 2) 25 ▾	<input type="radio"/> RMP using the Derived Method
Start Age (years) 16 ▾	
Help me choose	Help me choose

Screenshot of Worker Cancer Exposure Pathway

Select Pathways to Evaluate and Define Site Parameters

Pathways to Evaluate ☒ Inh ☒ Soil ☒ Dem ☐ MMilk ☐ Drink Water ☐ Fish ☐ HG Produce ☐ Beef & Dairy ☐

☐ Inhalation Only
☐ Mandatory Minimum Pathways
☒ Worker Pathways
☐ User Defined

☒ Inhalation (Always On)
☐ Soil Ingestion
☐ Dermal
☐ Mother's Milk
☐ Drinking Water
☐ Fish
☐ Homegrown Produce
☐ Beef
☐ Dairy Cows
☐ Pigs
☐ Chickens
☐ Eggs

Deposition Rate (for noninhalation pathways only)
☒ 0.05 m/s (uncontrolled sources)
☐ 0.02 m/s (controlled sources)
☐ Other

Advanced Options (Tier 2) - For noninhalation pathways only
☐ Change exposure frequency (days/year): [What's this do?](#)

[Help me choose](#)
[Click to select SCAQMD mandatory minimum pathways](#)

Screenshot of Worker Cancer Risk

View Risk Results

Cancer Chronic 8-hour Acute

Load File Risk Views Options Export

	REC	GRP	NETID	X	Y	RISK_SUM	SCENARIO
▶	1	ALL	UCART1	602440	4166420	7.4843e-10	25YrCancerDerived_InhSoilDem
	2	ALL	UCART1	602515	4166420	6.8845e-10	25YrCancerDerived_InhSoilDem
	3	ALL	UCART1	602590	4166420	8.2218e-10	25YrCancerDerived_InhSoilDem
	4	ALL	UCART1	602665	4166420	6.7948e-10	25YrCancerDerived_InhSoilDem
	5	ALL	UCART1	602740	4166420	6.7325e-10	25YrCancerDerived_InhSoilDem
	6	ALL	UCART1	602815	4166420	7.8804e-10	25YrCancerDerived_InhSoilDem
	7	ALL	UCART1	602890	4166420	8.5097e-10	25YrCancerDerived_InhSoilDem
	8	ALL	UCART1	602965	4166420	8.4213e-10	25YrCancerDerived_InhSoilDem
	9	ALL	UCART1	603040	4166420	7.1660e-10	25YrCancerDerived_InhSoilDem
	10	ALL	UCART1	603115	4166420	6.2207e-10	25YrCancerDerived_InhSoilDem
	11	ALL	UCART1	603190	4166420	6.2989e-10	25YrCancerDerived_InhSoilDem
	12	ALL	UCART1	603265	4166420	7.0545e-10	25YrCancerDerived_InhSoilDem
	13	ALL	UCART1	603340	4166420	7.0032e-10	25YrCancerDerived_InhSoilDem
	14	ALL	UCART1	603415	4166420	6.8650e-10	25YrCancerDerived_InhSoilDem
	15	ALL	UCART1	603490	4166420	6.4685e-10	25YrCancerDerived_InhSoilDem
	16	ALL	UCART1	603565	4166420	6.3181e-10	25YrCancerDerived_InhSoilDem
	17	ALL	UCART1	603640	4166420	6.2930e-10	25YrCancerDerived_InhSoilDem
	18	ALL	UCART1	603715	4166420	6.2729e-10	25YrCancerDerived_InhSoilDem
	19	ALL	UCART1	603790	4166420	6.0525e-10	25YrCancerDerived_InhSoilDem
	20	ALL	UCART1	603865	4166420	6.3172e-10	25YrCancerDerived_InhSoilDem
	21	ALL	UCART1	603940	4166420	5.8338e-10	25YrCancerDerived_InhSoilDem
	22	ALL	UCART1	604015	4166420	5.7631e-10	25YrCancerDerived_InhSoilDem
	23	ALL	UCART1	604090	4166420	5.9896e-10	25YrCancerDerived_InhSoilDem
	24	ALL	UCART1	604165	4166420	5.8667e-10	25YrCancerDerived_InhSoilDem
	25	ALL	UCART1	604240	4166420	5.5721e-10	25YrCancerDerived_InhSoilDem

Screenshot of Worker Cancer Risk (Continued)

View Risk Results							
Cancer Chronic 8-hour Acute							
Load File Risk Views Options Export							
	REC	GRP	NETID	X	Y	RISK_SUM	SCENARIO
	2185	ALL	UCART1	604240	4167860	1.2013e-08	25YrCancerDerived_InhSoilDem
	2186	ALL	UCART1	604315	4167860	1.2924e-08	25YrCancerDerived_InhSoilDem
	2187	ALL	UCART1	604390	4167860	1.3974e-08	25YrCancerDerived_InhSoilDem
	2188	ALL	UCART1	604465	4167860	1.5088e-08	25YrCancerDerived_InhSoilDem
	2189	ALL	UCART1	604540	4167860	1.6205e-08	25YrCancerDerived_InhSoilDem
	2190	ALL	UCART1	604615	4167860	1.7323e-08	25YrCancerDerived_InhSoilDem
	2191	ALL	UCART1	604690	4167860	1.8396e-08	25YrCancerDerived_InhSoilDem
	2192	ALL	UCART1	604765	4167860	1.9398e-08	25YrCancerDerived_InhSoilDem
	2193	ALL	UCART1	604840	4167860	2.0393e-08	25YrCancerDerived_InhSoilDem
	2194	ALL	UCART1	604915	4167860	2.1378e-08	25YrCancerDerived_InhSoilDem
	2195	ALL	UCART1	604990	4167860	2.2417e-08	25YrCancerDerived_InhSoilDem
	2196	ALL	UCART1	605065	4167860	2.3515e-08	25YrCancerDerived_InhSoilDem
	2197	ALL	UCART1	605140	4167860	2.4696e-08	25YrCancerDerived_InhSoilDem
	2198	ALL	UCART1	605215	4167860	2.5985e-08	25YrCancerDerived_InhSoilDem
▶	2199	ALL	UCART1	605290	4167860	2.7568e-08	25YrCancerDerived_InhSoilDem
	2200	ALL	UCART1	605365	4167860	3.0474e-08	25YrCancerDerived_InhSoilDem
	2201	ALL	UCART1	605440	4167860	3.2352e-08	25YrCancerDerived_InhSoilDem
	2202	ALL	UCART1	605515	4167860	3.1021e-08	25YrCancerDerived_InhSoilDem
	2203	ALL	UCART1	605590	4167860	2.9153e-08	25YrCancerDerived_InhSoilDem
	2204	ALL	UCART1	605665	4167860	2.7605e-08	25YrCancerDerived_InhSoilDem
	2205	ALL	UCART1	605740	4167860	2.6602e-08	25YrCancerDerived_InhSoilDem
	2206	ALL	UCART1	605815	4167860	2.6270e-08	25YrCancerDerived_InhSoilDem
	2207	ALL	UCART1	605890	4167860	2.7216e-08	25YrCancerDerived_InhSoilDem
	2208	ALL	UCART1	605965	4167860	2.9936e-08	25YrCancerDerived_InhSoilDem
	2209	ALL	UCART1	606040	4167860	3.2423e-08	25YrCancerDerived_InhSoilDem

Appendix E
HARP Model Risk Tables
June 17, 2020



Cancer Risk

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	*HARP - HRACalc v19044 6/16/2020 1:06:20 PM - Cancer Risk - Input File: C:\Users\Owner\Documents\2020 HARP Runs\Eliot Quarry HRA												
2	REC	GRP	NETID	X	Y	RISK_SUM	SCENARIC	INH_RISK	SOIL_RISK	DERMAL_I	MMILK_RI	WATER_RI	FISH_RISK
3	1	ALL	UCART1	602440	4166420	1.02E-08	30YrCance	1.02E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4	2	ALL	UCART1	602515	4166420	9.37E-09	30YrCance	9.37E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5	3	ALL	UCART1	602590	4166420	1.12E-08	30YrCance	1.12E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6	4	ALL	UCART1	602665	4166420	9.20E-09	30YrCance	9.20E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7	5	ALL	UCART1	602740	4166420	9.10E-09	30YrCance	9.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	6	ALL	UCART1	602815	4166420	1.06E-08	30YrCance	1.06E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	7	ALL	UCART1	602890	4166420	1.15E-08	30YrCance	1.15E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10	8	ALL	UCART1	602965	4166420	1.13E-08	30YrCance	1.13E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
11	9	ALL	UCART1	603040	4166420	9.57E-09	30YrCance	9.57E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
12	10	ALL	UCART1	603115	4166420	8.27E-09	30YrCance	8.27E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
13	11	ALL	UCART1	603190	4166420	8.34E-09	30YrCance	8.34E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
14	12	ALL	UCART1	603265	4166420	9.33E-09	30YrCance	9.33E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
15	13	ALL	UCART1	603340	4166420	9.23E-09	30YrCance	9.23E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
16	14	ALL	UCART1	603415	4166420	9.00E-09	30YrCance	9.00E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
17	15	ALL	UCART1	603490	4166420	8.44E-09	30YrCance	8.44E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
18	16	ALL	UCART1	603565	4166420	8.20E-09	30YrCance	8.20E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
19	17	ALL	UCART1	603640	4166420	8.11E-09	30YrCance	8.11E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
20	18	ALL	UCART1	603715	4166420	8.03E-09	30YrCance	8.03E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
21	19	ALL	UCART1	603790	4166420	7.71E-09	30YrCance	7.71E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Appendix E
HARP Model Risk Tables

June 17, 2020



Cancer Risk (continued)

A	B	C	D	E	F	G	H	I	J	K	L	M
8087	ALL	UCART1	608140	4171760	1.93E-08	30YrCance	1.93E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8088	ALL	UCART1	608215	4171760	1.89E-08	30YrCance	1.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8089	ALL	UCART1	608290	4171760	1.86E-08	30YrCance	1.86E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8090	ALL	UCART1	608365	4171760	1.82E-08	30YrCance	1.82E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8091	ALL	UCART1	608440	4171760	1.79E-08	30YrCance	1.79E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8092	ALL	UCART1	608515	4171760	1.75E-08	30YrCance	1.75E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8093	ALL	UCART1	608590	4171760	1.72E-08	30YrCance	1.72E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8094	ALL	UCART1	608665	4171760	1.69E-08	30YrCance	1.69E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8095	ALL	UCART1	608740	4171760	1.65E-08	30YrCance	1.65E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8096	ALL	UCART1	608815	4171760	1.62E-08	30YrCance	1.62E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8097	ALL	UCART1	608890	4171760	1.58E-08	30YrCance	1.58E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8098	ALL	UCART1	608965	4171760	1.55E-08	30YrCance	1.55E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8099	ALL	UCART1	609040	4171760	1.52E-08	30YrCance	1.52E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8100	ALL	UCART1	609115	4171760	1.48E-08	30YrCance	1.48E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8101	ALL		605410	4168336	7.69E-07	30YrCance	7.69E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8102	ALL		606909	4170423	3.91E-08	30YrCance	3.91E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8103	ALL		607431	4170782	2.92E-08	30YrCance	2.92E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8104	ALL		605408	4168358	7.42E-07	30YrCance	7.42E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8105	ALL		605406	4168358	7.48E-07	30YrCance	7.48E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8106	ALL		605460	4168378	5.89E-07	30YrCance	5.89E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8107	ALL		605460	4168344	6.24E-07	30YrCance	6.24E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Appendix E
HARP Model Risk Tables

June 17, 2020



Acute Risk

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	*HARP - HRA Calc v19044 6/16/2020 1:09:02 PM - Acute Risk - Input File: C:\Users\Owner\Documents\2020 HARP Runs\Eliot Quarry HRA Rev 2\hra\													
2	REC	GRP	NETID	X	Y	SCENARIC	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DE	RESP	SKIN
3		1 ALL	UCART1	602440	4166420	NonCance	1.12E-03	1.12E-03	2.52E-03	0.00E+00	0.00E+00	1.12E-03	9.59E-06	0.00E+00
4		2 ALL	UCART1	602515	4166420	NonCance	1.08E-03	1.08E-03	2.43E-03	0.00E+00	0.00E+00	1.08E-03	9.27E-06	0.00E+00
5		3 ALL	UCART1	602590	4166420	NonCance	1.28E-03	1.28E-03	2.87E-03	0.00E+00	0.00E+00	1.28E-03	1.09E-05	0.00E+00
6		4 ALL	UCART1	602665	4166420	NonCance	1.13E-03	1.13E-03	2.54E-03	0.00E+00	0.00E+00	1.13E-03	9.69E-06	0.00E+00
7		5 ALL	UCART1	602740	4166420	NonCance	1.16E-03	1.16E-03	2.59E-03	0.00E+00	0.00E+00	1.16E-03	9.83E-06	0.00E+00
8		6 ALL	UCART1	602815	4166420	NonCance	1.35E-03	1.35E-03	3.02E-03	0.00E+00	0.00E+00	1.35E-03	1.15E-05	0.00E+00
9		7 ALL	UCART1	602890	4166420	NonCance	1.45E-03	1.45E-03	3.25E-03	0.00E+00	0.00E+00	1.45E-03	1.24E-05	0.00E+00
10		8 ALL	UCART1	602965	4166420	NonCance	1.47E-03	1.47E-03	3.31E-03	0.00E+00	0.00E+00	1.47E-03	1.26E-05	0.00E+00
11		9 ALL	UCART1	603040	4166420	NonCance	1.38E-03	1.38E-03	3.09E-03	0.00E+00	0.00E+00	1.38E-03	1.17E-05	0.00E+00
12		10 ALL	UCART1	603115	4166420	NonCance	1.28E-03	1.28E-03	2.85E-03	0.00E+00	0.00E+00	1.28E-03	1.08E-05	0.00E+00
13		11 ALL	UCART1	603190	4166420	NonCance	1.34E-03	1.34E-03	2.98E-03	0.00E+00	0.00E+00	1.34E-03	1.13E-05	0.00E+00
14		12 ALL	UCART1	603265	4166420	NonCance	1.49E-03	1.49E-03	3.32E-03	0.00E+00	0.00E+00	1.49E-03	1.26E-05	0.00E+00
15		13 ALL	UCART1	603340	4166420	NonCance	1.52E-03	1.52E-03	3.44E-03	0.00E+00	0.00E+00	1.52E-03	1.31E-05	0.00E+00
16		14 ALL	UCART1	603415	4166420	NonCance	1.57E-03	1.57E-03	3.50E-03	0.00E+00	0.00E+00	1.57E-03	1.33E-05	0.00E+00
17		15 ALL	UCART1	603490	4166420	NonCance	1.54E-03	1.54E-03	3.44E-03	0.00E+00	0.00E+00	1.54E-03	1.30E-05	0.00E+00
18		16 ALL	UCART1	603565	4166420	NonCance	1.56E-03	1.56E-03	3.49E-03	0.00E+00	0.00E+00	1.56E-03	1.32E-05	0.00E+00
19		17 ALL	UCART1	603640	4166420	NonCance	1.67E-03	1.67E-03	3.71E-03	0.00E+00	0.00E+00	1.67E-03	1.41E-05	0.00E+00
20		18 ALL	UCART1	603715	4166420	NonCance	1.78E-03	1.79E-03	3.97E-03	0.00E+00	0.00E+00	1.79E-03	1.50E-05	0.00E+00
21		19 ALL	UCART1	603790	4166420	NonCance	1.79E-03	1.79E-03	3.98E-03	0.00E+00	0.00E+00	1.79E-03	1.51E-05	0.00E+00

Appendix E
HARP Model Risk Tables

June 17, 2020



Acute Risk (continued)

	A	B	C	D	E	F	G	H	I	J	K	L	M
8089	8087	ALL	UCART1	608140	4171760	NonCancel	1.91E-03	1.91E-03	4.30E-03	0.00E+00	0.00E+00	1.91E-03	1.64E-03
8090	8088	ALL	UCART1	608215	4171760	NonCancel	1.89E-03	1.90E-03	4.27E-03	0.00E+00	0.00E+00	1.90E-03	1.63E-03
8091	8089	ALL	UCART1	608290	4171760	NonCancel	1.89E-03	1.89E-03	4.26E-03	0.00E+00	0.00E+00	1.89E-03	1.62E-03
8092	8090	ALL	UCART1	608365	4171760	NonCancel	1.87E-03	1.87E-03	4.21E-03	0.00E+00	0.00E+00	1.87E-03	1.61E-03
8093	8091	ALL	UCART1	608440	4171760	NonCancel	1.86E-03	1.86E-03	4.19E-03	0.00E+00	0.00E+00	1.86E-03	1.60E-03
8094	8092	ALL	UCART1	608515	4171760	NonCancel	1.84E-03	1.84E-03	4.14E-03	0.00E+00	0.00E+00	1.84E-03	1.58E-03
8095	8093	ALL	UCART1	608590	4171760	NonCancel	1.83E-03	1.83E-03	4.11E-03	0.00E+00	0.00E+00	1.83E-03	1.57E-03
8096	8094	ALL	UCART1	608665	4171760	NonCancel	1.82E-03	1.82E-03	4.10E-03	0.00E+00	0.00E+00	1.82E-03	1.56E-03
8097	8095	ALL	UCART1	608740	4171760	NonCancel	1.81E-03	1.81E-03	4.08E-03	0.00E+00	0.00E+00	1.81E-03	1.55E-03
8098	8096	ALL	UCART1	608815	4171760	NonCancel	1.79E-03	1.79E-03	4.03E-03	0.00E+00	0.00E+00	1.79E-03	1.54E-03
8099	8097	ALL	UCART1	608890	4171760	NonCancel	1.77E-03	1.77E-03	3.98E-03	0.00E+00	0.00E+00	1.77E-03	1.51E-03
8100	8098	ALL	UCART1	608965	4171760	NonCancel	1.76E-03	1.76E-03	3.95E-03	0.00E+00	0.00E+00	1.76E-03	1.51E-03
8101	8099	ALL	UCART1	609040	4171760	NonCancel	1.76E-03	1.76E-03	3.94E-03	0.00E+00	0.00E+00	1.76E-03	1.50E-03
8102	8100	ALL	UCART1	609115	4171760	NonCancel	1.73E-03	1.73E-03	3.89E-03	0.00E+00	0.00E+00	1.73E-03	1.48E-03
8103	8101	ALL		605410	4168336	NonCancel	3.05E-02	3.05E-02	6.52E-02	0.00E+00	0.00E+00	3.05E-02	2.42E-04
8104	8102	ALL		606909	4170423	NonCancel	2.75E-03	2.75E-03	6.18E-03	0.00E+00	0.00E+00	2.75E-03	2.35E-03
8105	8103	ALL		607431	4170782	NonCancel	2.38E-03	2.38E-03	5.35E-03	0.00E+00	0.00E+00	2.38E-03	2.04E-03
8106	8104	ALL		605408	4168358	NonCancel	2.77E-02	2.77E-02	5.92E-02	0.00E+00	0.00E+00	2.77E-02	2.20E-04
8107	8105	ALL		605406	4168358	NonCancel	2.78E-02	2.78E-02	5.94E-02	0.00E+00	0.00E+00	2.78E-02	2.20E-04
8108	8106	ALL		605460	4168378	NonCancel	2.31E-02	2.31E-02	4.94E-02	0.00E+00	0.00E+00	2.31E-02	1.84E-04
8109	8107	ALL		605460	4168344	NonCancel	2.64E-02	2.64E-02	5.65E-02	0.00E+00	0.00E+00	2.64E-02	2.10E-04

Appendix E
HARP Model Risk Tables
June 17, 2020



Chronic Risk

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	*HARP - HRA Calc v19044 6/16/2020 1:07:58 PM - Chronic Risk - Input File: C:\Users\Owner\Documents\2020 HARP Runs\Eliot Quarry HRA Rev 2\hra													
2	REC	GRP	NETID	X	Y	SCENARIC	CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DE	RESP	SKIN
3	1	ALL	UCART1	602440	4166420	NonCance	4.01E-05	4.01E-05	1.43E-08	3.35E-09	1.19E-09	4.02E-05	5.12E-05	4.01E-05
4	2	ALL	UCART1	602515	4166420	NonCance	3.83E-05	3.84E-05	1.32E-08	3.12E-09	1.10E-09	3.84E-05	4.86E-05	3.83E-05
5	3	ALL	UCART1	602590	4166420	NonCance	4.69E-05	4.69E-05	1.58E-08	3.75E-09	1.32E-09	4.70E-05	5.92E-05	4.69E-05
6	4	ALL	UCART1	602665	4166420	NonCance	4.10E-05	4.10E-05	1.31E-08	3.16E-09	1.09E-09	4.11E-05	5.13E-05	4.10E-05
7	5	ALL	UCART1	602740	4166420	NonCance	4.25E-05	4.25E-05	1.30E-08	3.18E-09	1.09E-09	4.26E-05	5.28E-05	4.25E-05
8	6	ALL	UCART1	602815	4166420	NonCance	5.14E-05	5.14E-05	1.53E-08	3.76E-09	1.28E-09	5.15E-05	6.35E-05	5.14E-05
9	7	ALL	UCART1	602890	4166420	NonCance	5.71E-05	5.71E-05	1.66E-08	4.10E-09	1.38E-09	5.72E-05	7.02E-05	5.71E-05
10	8	ALL	UCART1	602965	4166420	NonCance	5.92E-05	5.92E-05	1.65E-08	4.12E-09	1.38E-09	5.93E-05	7.23E-05	5.92E-05
11	9	ALL	UCART1	603040	4166420	NonCance	5.45E-05	5.45E-05	1.42E-08	3.62E-09	1.18E-09	5.46E-05	6.59E-05	5.45E-05
12	10	ALL	UCART1	603115	4166420	NonCance	5.05E-05	5.05E-05	1.24E-08	3.22E-09	1.03E-09	5.06E-05	6.05E-05	5.05E-05
13	11	ALL	UCART1	603190	4166420	NonCance	5.35E-05	5.35E-05	1.26E-08	3.32E-09	1.05E-09	5.35E-05	6.37E-05	5.35E-05
14	12	ALL	UCART1	603265	4166420	NonCance	6.14E-05	6.14E-05	1.42E-08	3.76E-09	1.18E-09	6.15E-05	7.29E-05	6.14E-05
15	13	ALL	UCART1	603340	4166420	NonCance	6.35E-05	6.35E-05	1.41E-08	3.79E-09	1.18E-09	6.35E-05	7.50E-05	6.35E-05
16	14	ALL	UCART1	603415	4166420	NonCance	6.58E-05	6.58E-05	1.40E-08	3.81E-09	1.17E-09	6.59E-05	7.73E-05	6.58E-05
17	15	ALL	UCART1	603490	4166420	NonCance	6.52E-05	6.52E-05	1.32E-08	3.67E-09	1.11E-09	6.52E-05	7.61E-05	6.52E-05
18	16	ALL	UCART1	603565	4166420	NonCance	6.73E-05	6.73E-05	1.30E-08	3.67E-09	1.09E-09	6.73E-05	7.82E-05	6.73E-05
19	17	ALL	UCART1	603640	4166420	NonCance	7.17E-05	7.17E-05	1.31E-08	3.77E-09	1.10E-09	7.18E-05	8.27E-05	7.17E-05
20	18	ALL	UCART1	603715	4166420	NonCance	7.63E-05	7.63E-05	1.32E-08	3.88E-09	1.10E-09	7.64E-05	8.75E-05	7.63E-05
21	19	ALL	UCART1	603790	4166420	NonCance	7.68E-05	7.68E-05	1.28E-08	3.83E-09	1.07E-09	7.69E-05	8.78E-05	7.68E-05

Chronic Risk (continued)

A8105														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
8089	8087	ALL	UCART1	608140	4171760	NonCancel	6.05E-05	6.05E-05	2.50E-08	5.53E-09	2.08E-09	6.06E-05	8.36E-05	6.05E-05
8090	8088	ALL	UCART1	608215	4171760	NonCancel	5.96E-05	5.96E-05	2.45E-08	5.44E-09	2.04E-09	5.98E-05	8.23E-05	5.96E-05
8091	8089	ALL	UCART1	608290	4171760	NonCancel	5.90E-05	5.90E-05	2.41E-08	5.36E-09	2.01E-09	5.91E-05	8.12E-05	5.90E-05
8092	8090	ALL	UCART1	608365	4171760	NonCancel	5.82E-05	5.82E-05	2.36E-08	5.26E-09	1.97E-09	5.83E-05	7.99E-05	5.82E-05
8093	8091	ALL	UCART1	608440	4171760	NonCancel	5.75E-05	5.75E-05	2.32E-08	5.18E-09	1.94E-09	5.77E-05	7.89E-05	5.75E-05
8094	8092	ALL	UCART1	608515	4171760	NonCancel	5.67E-05	5.67E-05	2.28E-08	5.09E-09	1.90E-09	5.68E-05	7.77E-05	5.67E-05
8095	8093	ALL	UCART1	608590	4171760	NonCancel	5.60E-05	5.60E-05	2.24E-08	5.00E-09	1.87E-09	5.62E-05	7.67E-05	5.60E-05
8096	8094	ALL	UCART1	608665	4171760	NonCancel	5.52E-05	5.52E-05	2.19E-08	4.91E-09	1.83E-09	5.53E-05	7.54E-05	5.52E-05
8097	8095	ALL	UCART1	608740	4171760	NonCancel	5.43E-05	5.43E-05	2.15E-08	4.81E-09	1.79E-09	5.45E-05	7.41E-05	5.43E-05
8098	8096	ALL	UCART1	608815	4171760	NonCancel	5.36E-05	5.36E-05	2.11E-08	4.73E-09	1.76E-09	5.38E-05	7.31E-05	5.36E-05
8099	8097	ALL	UCART1	608890	4171760	NonCancel	5.28E-05	5.28E-05	2.07E-08	4.64E-09	1.72E-09	5.29E-05	7.18E-05	5.28E-05
8100	8098	ALL	UCART1	608965	4171760	NonCancel	5.19E-05	5.19E-05	2.02E-08	4.54E-09	1.69E-09	5.20E-05	7.05E-05	5.19E-05
8101	8099	ALL	UCART1	609040	4171760	NonCancel	5.12E-05	5.12E-05	1.98E-08	4.46E-09	1.65E-09	5.14E-05	6.95E-05	5.12E-05
8102	8100	ALL	UCART1	609115	4171760	NonCancel	5.04E-05	5.04E-05	1.94E-08	4.37E-09	1.62E-09	5.05E-05	6.83E-05	5.04E-05
8103	8101	ALL		605410	4168336	NonCancel	1.15E-03	1.15E-03	9.90E-07	2.00E-07	8.26E-08	1.16E-03	1.88E-03	1.15E-03
8104	8102	ALL		606909	4170423	NonCancel	1.19E-04	1.19E-04	5.01E-08	1.10E-08	4.18E-09	1.19E-04	1.66E-04	1.19E-04
8105	8103	ALL		607431	4170782	NonCancel	9.41E-05	9.42E-05	3.78E-08	8.41E-09	3.15E-09	9.44E-05	1.29E-04	9.41E-05
8106	8104	ALL		605408	4168358	NonCancel	1.11E-03	1.11E-03	9.54E-07	1.92E-07	7.97E-08	1.11E-03	1.82E-03	1.11E-03
8107	8105	ALL		605406	4168358	NonCancel	1.12E-03	1.12E-03	9.62E-07	1.94E-07	8.03E-08	1.12E-03	1.83E-03	1.12E-03
8108	8106	ALL		605460	4168378	NonCancel	9.47E-04	9.47E-04	7.59E-07	1.54E-07	6.34E-08	9.50E-04	1.52E-03	9.47E-04
8109	8107	ALL		605460	4168344	NonCancel	1.00E-03	1.00E-03	8.05E-07	1.63E-07	6.72E-08	1.01E-03	1.61E-03	1.00E-03

Table 1
Annual PM2.5 Emission Rate for AERMOD

CEMEX Construction Materials Pacific, LLC.
Eliot Quarry SMP-23 Reclamation Plan Amendment Project
Health Risk Assessment



AVERAGE ANNUAL PM2.5 TOTAL EMISSIONS (TONS/YEAR)

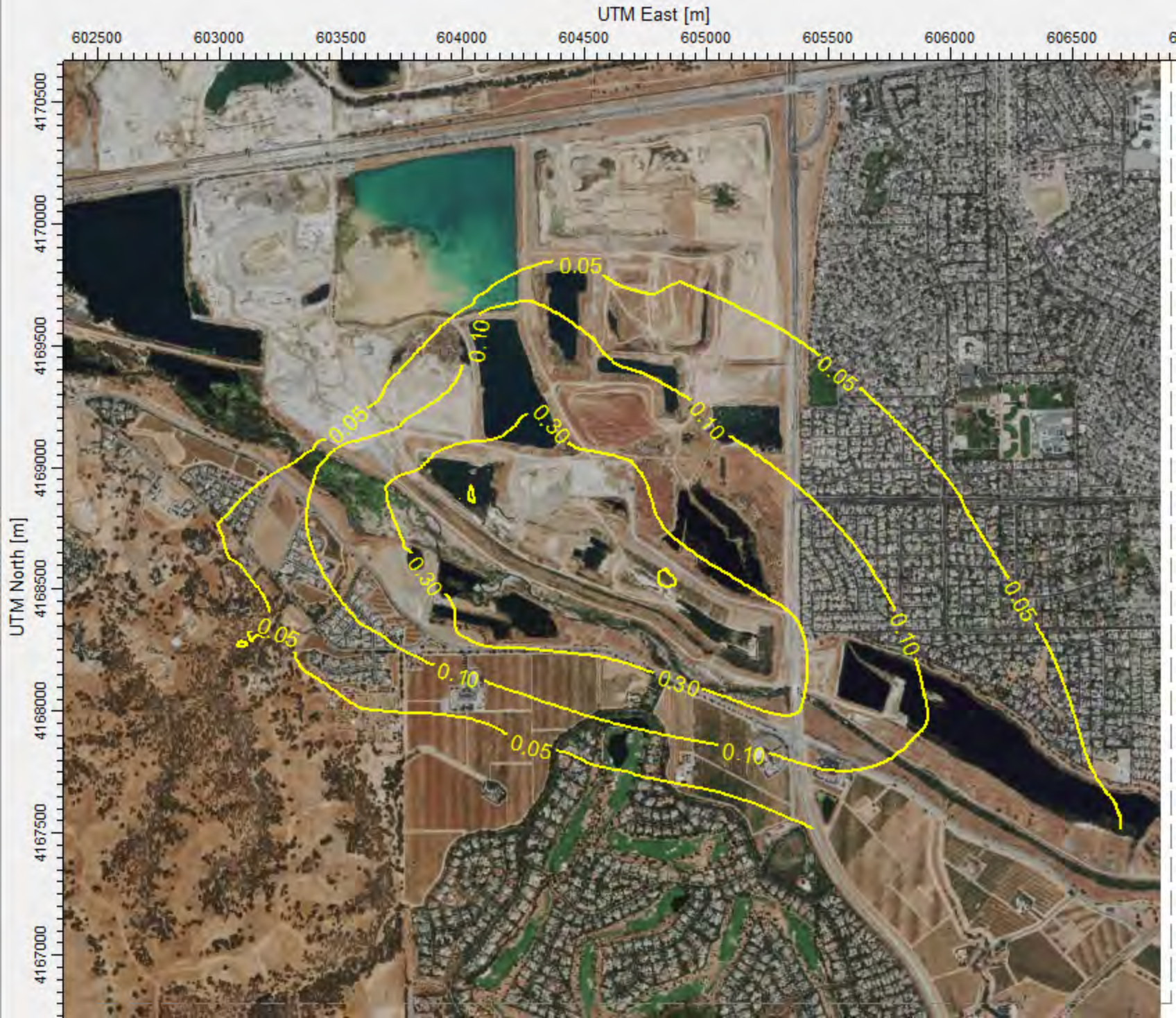
Lake A Area Reclamation				Lake B Area Reclamation				North Area Reclamation			
Year	Calendar Year	PM2.5 Total (tons/yr)		Year	Calendar Year	PM2.5 Total (tons/yr)		Year	Calendar Year	PM2.5 Total (tons/yr)	
1	2022	0.09	1.80E+02 lbs/yr	1	2022	0.28	5.60E+02 lbs/yr	1	2022	0	
2	2023		2.05E-02 lbs/hr	2	2023	0	6.39E-02 lbs/hr	2	2023	0	
3	2024	0	9.33E+00 grams/hr	3	2024	0	2.90E+01 grams/hr	3	2024	0	
4	2025	0	2.59E-03 grams/sec	4	2025	0	8.06E-03 grams/sec	4	2025	0	
5	2026	0	1,370,691 Area (m2)	5	2026	0	175,326 Area (m2)	5	2026	0	
6	2027	0	1.89E-09 Q/A	6	2027	0	4.60E-08 Q/A	6	2027	0	
7	2028	0	Q/A input for AERMOD	7	2028	0.0128	Q/A input for AERMOD	7	2028	0	
8	2029	0		8	2029	0		8	2029	0	
9	2030	0		9	2030	3.10E-04		9	2030	3.37E-03	
10	2031	0		10	2031	0		10	2031	0	
11	2032	0		11	2032	0		11	2032	0	
12	2033	0		12	2033	0		12	2033	0	
13	2034	0		13	2034	0		13	2034	0	
14	2035	0		14	2035	0		14	2035	0	
15	2036	0		15	2036	0		15	2036	0	
16	2037	0		16	2037	0		16	2037	0	
17	2038	0		17	2038	0		17	2038	0	
18	2039	0		18	2039	0		18	2039	0	
19	2040	0		19	2040	0		19	2040	0	
20	2041	0		20	2041	0		20	2041	0	
21	2042	0		21	2042	0		21	2042	0	
22	2043	0		22	2043	0		22	2043	0	
23	2044	0		23	2044	0		23	2044	0	
24	2045	0		24	2045	0		24	2045	0	
25	2046	0		25	2046	0		25	2046	0	
26	2047	0		26	2047	0		26	2047	0	
27	2048	0		27	2048	0		27	2048	0	
28	2049	0		28	2049	1.18E-03		28	2049	0.0125	
29	2050	0		29	2050	0		29	2050	0	
30	2051	0		30	2051	0		30	2051	0	
Average:		0.003103		Average:		0.00981		Average:		0.000529	

Source:

Air and Greenhouse Gas Emissions Study (Compass Land Group, December 2019).

Notes:

1. For Lake A Area Reclamation, results from Appendix A-3 Annual Results summary.
2. For Lake B Area Reclamation, results from Appendix A-4 Annual Results summary and A-5. Year 28 (2049) result is CalEEMod proxy for 2056 reclamation emissions.
3. For North Area Reclamation, results from Appendix A-6. Year 28 (2049) result is CalEEMod proxy for 2056 reclamation emissions.



```

**
*****
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.8.3
** Lakes Environmental Software Inc.
** Date: 6/15/2020
** File: C:\Lakes\AERMOD View\Eliot2.ADI
**
*****
**
**
*****
** AERMOD Control Pathway
*****
**
**
CO STARTING
  TITLEONE C:\Lakes\AERMOD View\Eliot2\Eliot2.isc
  TITLETWO Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013
  MODELOPT CONC FLAT ELEV
  AVERTIME ANNUAL
  URBANOPT 15000
  POLLUTID GENERIC
  RUNORNOT RUN
  ERRORFIL Eliot2.err
CO FINISHED
**
*****
** AERMOD Source Pathway
*****
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
  LOCATION LAKEB AREAPOLY 605362.931 4167915.335 128.020
** DESCRSRC Lake Barea
  LOCATION AREA_A AREAPOLY 606832.418 4167539.419 133.000
** Source Parameters **
  SRCPARAM LAKEB 4.6E-08 5.000 15
  AREAVERT LAKEB 605362.931 4167915.335 604565.535 4168239.989
  AREAVERT LAKEB 603950.400 4168268.467 603375.136 4168969.037
  AREAVERT LAKEB 603460.571 4169094.342 603756.747 4169031.689
  AREAVERT LAKEB 603756.747 4169185.473 604092.792 4169139.907
  AREAVERT LAKEB 604018.748 4169641.128 604246.576 4169652.519
  AREAVERT LAKEB 604388.968 4169060.168 604537.056 4169071.559
  AREAVERT LAKEB 604690.840 4169031.689 604702.231 4168735.514
  AREAVERT LAKEB 605317.365 4168399.468
  SRCPARAM AREA_A 1.89E-09 5.000 7
  AREAVERT AREA_A 606832.418 4167539.419 605545.193 4168194.423
  AREAVERT AREA_A 605533.802 4168040.640 605716.064 4167995.074
  AREAVERT AREA_A 605978.065 4167835.595 606484.981 4167562.202
  AREAVERT AREA_A 606758.374 4167442.592
  URBANSRC ALL
  SRCGROUP ALL
SO FINISHED
**
*****

```

```
** AERMOD Receptor Pathway
*****
**
**
RE STARTING
  INCLUDED Eliot2.rou
RE FINISHED
**
```

```
*****
** AERMOD Meteorology Pathway
*****
**
**
```

```
ME STARTING
  SURFFILE 724927.SFC
  PROFFILE 724927.PFL
  SURFDATA 23285 2009
  UAIRDATA 23230 2009 OAKLAND/WSO_AP
  PROFBASE 110.58 METERS
ME FINISHED
**
```

```
*****
** AERMOD Output Pathway
*****
**
**
```

```
OU STARTING
** Auto-Generated Plotfiles
  PLOTFILE ANNUAL ALL ELIOT2.AD\AN00GALL.PLT 31
  SUMMFILE Eliot2.sum
OU FINISHED
```

*** Message Summary For AERMOD Model Setup ***

----- Summary of Total Messages -----

A Total of	0 Fatal Error Message(s)
A Total of	2 Warning Message(s)
A Total of	0 Informational Message(s)

```
***** FATAL ERROR MESSAGES *****
*** NONE ***
```

```
***** WARNING MESSAGES *****
CO W320      23      URBOP: Input Parameter May Be Out-of-Range for Parameter      URB-POP
RE W213     2254     RECAP: ELEV Input Inconsistent With Option: Input Ignored      UCART1
```

```
*****
*** SETUP Finishes Successfully ***
*****
```


*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc *** 06/15/20
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013 *** 11:08:38
*** MODELOPTs: NonDEFAULT CONC FLAT and ELEV URBAN *** PAGE 1

*** MODEL SETUP OPTIONS SUMMARY ***

-- --
**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --

**NO GAS DEPOSITION Data Provided.

**NO PARTICLE DEPOSITION Data Provided.

**Model Uses NO DRY DEPLETION. DRYDPLT = F

**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses URBAN Dispersion Algorithm for the SBL for 2 Source(s),
for Total of 1 Urban Area(s):
Urban Population = 15000.0 ; Urban Roughness Length = 1.000 m

**Model Allows User-Specified Options:

1. Stack-tip Downwash.
2. Allow FLAT/ELEV Terrain Option by Source,
with 0 FLAT and 2 ELEV Source(s).
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.
6. Urban Roughness Length of 1.0 Meter Used.

**Other Options Specified:

CCVR_Sub - Meteorological data includes CCVR substitutions

TEMP_Sub - Meteorological data includes TEMP substitutions

**Model Assumes No FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: GENERIC

**Model Calculates ANNUAL Averages Only

**This Run Includes: 2 Source(s); 1 Source Group(s); and 6404 Receptor(s)

with: 0 POINT(s), including
 0 POINTCAP(s) and 0 POINTHOR(s)
and: 0 VOLUME source(s)
and: 2 AREA type source(s)
and: 0 LINE source(s)
and: 0 RLINE/RLINEXT source(s)
and: 0 OPENPIT source(s)
and: 0 BUOYANT LINE source(s) with 0 line(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 14134

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 110.58 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 4.1 MB of RAM.

**Input Runstream File: aermod.inp
**Output Print File: aermod.out

**Detailed Error/Message File: Eliot2.err
**File for Summary of Results: Eliot2.sum

```

*** AERMOD - VERSION 19191 ***   *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc   ***   06/15/20
*** AERMET - VERSION 14134 ***   *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013   ***   11:08:38
*** MODELOPTs:      NonDEFAULT CONC FLAT and ELEV URBAN   ***   PAGE 2

```

*** AREAPOLY SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC /METER**2)	LOCATION OF AREA X Y (METERS) (METERS)		BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	NUMBER OF VERTS.	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
LAKES	0	0.46000E-07	605362.9	4167915.3	128.0	5.00	15	0.00	YES	
AREA_A	0	0.18900E-08	606832.4	4167539.4	133.0	5.00	7	0.00	YES	

*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013
*** MODELOPTs: NonDEFAULT CONC FLAT and ELEV URBAN

*** 06/15/20
*** 11:08:38
*** PAGE 3

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID

SOURCE IDs

ALL LAKEB , AREA_A ,

*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013
*** MODELOPTs: NonDEFAULT CONC FLAT and ELEV URBAN

*** 06/15/20
*** 11:08:38
*** PAGE 4

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

URBAN ID	URBAN POP	SOURCE IDs
-----	-----	-----
	15000. LAKEB	, AREA_A ,

*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013
*** MODELOPTs: NonDEFAULT CONC FLAT and ELEV URBAN

*** 06/15/20
*** 11:08:38
PAGE 5

*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

*** X-COORDINATES OF GRID ***
(METERS)

602836.0,	602886.0,	602936.0,	602986.0,	603036.0,	603086.0,	603136.0,	603186.0,	603236.0,	603286.0,
603336.0,	603386.0,	603436.0,	603486.0,	603536.0,	603586.0,	603636.0,	603686.0,	603736.0,	603786.0,
603836.0,	603886.0,	603936.0,	603986.0,	604036.0,	604086.0,	604136.0,	604186.0,	604236.0,	604286.0,
604336.0,	604386.0,	604436.0,	604486.0,	604536.0,	604586.0,	604636.0,	604686.0,	604736.0,	604786.0,
604836.0,	604886.0,	604936.0,	604986.0,	605036.0,	605086.0,	605136.0,	605186.0,	605236.0,	605286.0,
605336.0,	605386.0,	605436.0,	605486.0,	605536.0,	605586.0,	605636.0,	605686.0,	605736.0,	605786.0,
605836.0,	605886.0,	605936.0,	605986.0,	606036.0,	606086.0,	606136.0,	606186.0,	606236.0,	606286.0,
606336.0,	606386.0,	606436.0,	606486.0,	606536.0,	606586.0,	606636.0,	606686.0,	606736.0,	606786.0,

*** Y-COORDINATES OF GRID ***
(METERS)

4167521.0,	4167571.0,	4167621.0,	4167671.0,	4167721.0,	4167771.0,	4167821.0,	4167871.0,	4167921.0,	4167971.0,
4168021.0,	4168071.0,	4168121.0,	4168171.0,	4168221.0,	4168271.0,	4168321.0,	4168371.0,	4168421.0,	4168471.0,
4168521.0,	4168571.0,	4168621.0,	4168671.0,	4168721.0,	4168771.0,	4168821.0,	4168871.0,	4168921.0,	4168971.0,
4169021.0,	4169071.0,	4169121.0,	4169171.0,	4169221.0,	4169271.0,	4169321.0,	4169371.0,	4169421.0,	4169471.0,
4169521.0,	4169571.0,	4169621.0,	4169671.0,	4169721.0,	4169771.0,	4169821.0,	4169871.0,	4169921.0,	4169971.0,
4170021.0,	4170071.0,	4170121.0,	4170171.0,	4170221.0,	4170271.0,	4170321.0,	4170371.0,	4170421.0,	4170471.0,
4170521.0,	4170571.0,	4170621.0,	4170671.0,	4170721.0,	4170771.0,	4170821.0,	4170871.0,	4170921.0,	4170971.0,
4171021.0,	4171071.0,	4171121.0,	4171171.0,	4171221.0,	4171271.0,	4171321.0,	4171371.0,	4171421.0,	4171471.0,

*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013
*** MODELOPTs: NonDEFAULT CONC FLAT and ELEV URBAN

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*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

* ELEVATION HEIGHTS IN METERS *

Y-COORD (METERS)	602836.00	602886.00	602936.00	602986.00	603036.00	603086.00	603136.00	603186.00	603236.00
4171471.00 |	112.00	112.00	112.50	113.00	113.00	113.00	113.00	114.00	114.00
4171421.00 |	112.00	112.10	113.00	113.00	113.00	113.00	113.70	113.90	114.00
4171371.00 |	112.00	112.40	113.00	113.00	113.00	113.00	113.10	113.90	114.00
4171321.00 |	112.00	113.00	113.00	113.00	113.00	113.00	113.90	114.00	114.00
4171271.00 |	112.70	113.00	113.00	113.00	113.00	113.20	114.00	114.00	114.00
4171221.00 |	112.70	113.00	113.00	113.00	113.00	114.00	114.00	114.00	114.00
4171171.00 |	112.60	113.00	113.00	113.10	113.20	114.00	114.00	114.00	114.00
4171121.00 |	113.00	113.10	114.00	113.20	113.50	114.00	114.00	114.00	114.00
4171071.00 |	113.00	113.90	113.90	113.00	114.00	114.00	114.00	114.00	114.00
4171021.00 |	113.30	114.00	113.90	113.40	113.40	113.50	113.50	113.30	113.00
4170971.00 |	113.40	114.00	114.00	114.00	114.00	113.00	113.00	113.00	113.00
4170921.00 |	114.60	114.00	114.00	114.00	113.70	113.00	113.00	113.00	113.00
4170871.00 |	116.00	115.30	114.50	113.30	113.00	113.00	113.00	113.00	113.00
4170821.00 |	116.00	115.70	114.10	113.20	113.00	113.00	113.70	113.70	114.20
4170771.00 |	116.00	116.00	114.80	113.60	113.80	113.10	114.00	114.90	115.00
4170721.00 |	115.90	116.00	115.40	114.00	113.80	113.00	113.00	113.50	114.50
4170671.00 |	115.70	116.00	115.90	115.00	113.60	113.00	113.00	113.00	113.10
4170621.00 |	115.70	116.00	116.00	114.60	113.10	113.00	113.00	113.00	113.10
4170571.00 |	115.60	116.00	115.90	113.90	113.00	113.00	113.40	113.90	114.50
4170521.00 |	114.80	115.50	115.10	113.30	113.00	113.20	114.80	115.00	115.00
4170471.00 |	115.00	115.20	115.10	114.10	113.80	114.80	115.00	115.00	115.00
4170421.00 |	114.00	116.90	117.00	117.00	115.80	116.00	116.00	116.00	116.00
4170371.00 |	114.60	121.00	121.00	117.80	116.20	116.00	116.00	116.00	116.00
4170321.00 |	114.20	117.50	119.60	119.90	118.30	116.00	116.00	116.00	116.00
4170271.00 |	115.50	116.70	117.60	118.90	118.40	117.50	117.40	117.30	117.00
4170221.00 |	116.70	116.40	116.90	118.00	117.80	117.90	117.00	117.30	117.80
4170171.00 |	115.70	116.10	116.00	116.90	117.50	117.20	117.90	117.00	117.00
4170121.00 |	106.50	116.00	116.00	116.00	117.00	117.00	117.40	117.80	117.00
4170071.00 |	105.00	116.00	116.00	116.00	116.40	117.00	117.00	117.30	117.80
4170021.00 |	105.00	116.00	116.00	116.00	116.10	117.00	117.00	117.00	117.00
4169971.00 |	105.00	115.70	116.00	116.00	116.00	116.50	117.00	117.00	116.50
4169921.00 |	105.00	115.30	116.00	116.00	116.00	116.10	117.00	116.50	116.00
4169871.00 |	105.00	114.80	116.00	116.00	116.00	116.00	116.10	116.00	116.00
4169821.00 |	105.00	113.70	116.50	115.60	116.00	116.00	116.00	116.00	116.00
4169771.00 |	105.00	110.50	107.80	113.40	116.00	115.80	116.00	118.70	121.10
4169721.00 |	105.00	107.90	110.70	116.90	117.70	115.50	110.00	111.50	111.50
4169671.00 |	105.00	105.00	105.90	118.70	119.20	118.90	115.20	114.00	117.00
4169621.00 |	105.00	105.00	106.20	115.40	118.40	119.40	118.80	119.00	118.30
4169571.00 |	105.00	105.00	105.90	106.20	108.20	111.20	113.20	116.90	112.20
4169521.00 |	105.00	105.00	105.00	105.00	105.00	105.00	105.00	110.40	108.90

*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013
*** MODELOPTs: NonDEFAULT CONC FLAT and ELEV URBAN

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*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

* HILL HEIGHT SCALES IN METERS *

Y-COORD (METERS)	X-COORD (METERS)							
	606436.00	606486.00	606536.00	606586.00	606636.00	606686.00	606736.00	606786.00
4169471.00	134.70	135.00	136.00	136.00	137.00	138.00	138.70	139.00
4169421.00	134.70	135.00	136.00	136.00	137.00	138.00	138.10	139.00
4169371.00	134.40	135.00	136.00	136.00	137.00	138.00	138.00	139.00
4169321.00	134.00	135.00	135.10	136.00	137.00	138.00	138.00	139.00
4169271.00	134.00	134.50	135.10	136.00	137.00	138.00	138.00	139.00
4169221.00	134.00	134.40	135.10	136.00	137.00	138.00	138.00	139.00
4169171.00	134.00	134.50	135.10	136.00	137.10	138.00	138.70	139.00
4169121.00	134.00	135.00	135.80	136.60	137.40	138.00	138.70	139.00
4169071.00	134.00	135.00	136.00	136.70	137.40	138.10	139.00	139.40
4169021.00	134.80	135.40	136.10	137.00	138.00	138.20	139.10	140.00
4168971.00	135.40	135.90	136.10	137.60	138.00	139.00	139.70	140.00
4168921.00	136.50	136.50	137.00	137.90	138.40	139.10	140.00	140.40
4168871.00	137.00	137.20	138.00	138.10	139.00	139.20	140.00	140.50
4168821.00	137.00	138.00	138.10	139.00	139.00	140.00	140.00	141.00
4168771.00	137.40	138.20	139.00	139.40	140.00	140.00	140.90	141.00
4168721.00	138.00	138.50	139.10	140.00	140.10	141.00	141.00	141.00
4168671.00	138.00	139.00	139.80	140.00	140.90	141.00	141.00	141.30
4168621.00	138.00	139.00	140.00	140.40	141.00	141.00	141.40	142.00
4168571.00	138.00	139.00	140.00	140.60	141.00	141.00	141.70	142.00
4168521.00	138.00	139.00	140.00	140.00	141.00	141.00	141.10	142.00
4168471.00	137.70	138.70	139.10	140.00	140.40	141.00	141.00	141.70
4168421.00	137.00	138.00	139.00	139.70	140.00	140.90	141.00	141.30
4168371.00	136.80	137.50	138.20	139.10	140.00	140.10	141.00	141.00
4168321.00	135.90	136.70	138.00	138.90	139.20	140.00	140.40	140.70
4168271.00	135.00	136.30	137.10	138.00	138.90	139.10	140.00	140.00
4168221.00	134.10	135.40	136.20	137.70	138.10	139.00	139.10	140.00
4168171.00	134.00	135.00	136.00	136.90	137.70	138.10	139.00	139.40
4168121.00	134.00	134.90	135.90	136.00	137.30	138.00	138.60	139.00
4168071.00	133.80	134.40	135.00	135.80	137.00	138.00	138.00	139.00
4168021.00	133.40	134.00	135.00	135.70	136.40	137.10	138.00	138.40
4167971.00	133.00	134.00	135.00	135.60	136.00	137.10	138.00	138.50
4167921.00	133.00	134.00	134.20	135.00	136.00	137.00	137.70	139.00
4167871.00	132.90	133.40	134.00	134.90	135.40	136.10	137.70	139.00
4167821.00	132.60	133.00	134.00	134.60	135.30	136.10	137.60	139.30
4167771.00	132.00	132.50	133.20	134.00	135.00	136.00	136.70	138.40
4167721.00	131.90	132.20	133.00	133.90	134.20	135.00	135.90	136.90
4167671.00	131.80	132.20	132.20	133.00	133.90	134.10	134.80	135.20
4167621.00	132.60	133.00	133.00	133.00	133.10	134.00	134.00	134.00
4167571.00	132.00	133.00	134.00	133.50	133.50	133.00	133.40	133.30
4167521.00	132.70	133.10	134.00	134.00	134.00	134.00	133.40	133.20

*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013
*** MODELOPTs: NonDEFAULT CONC FLAT and ELEV URBAN

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*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(605404.0, 4169223.0,	123.3,	123.3,	0.0);	(605631.0, 4168311.0,	129.8,	129.8,	0.0);
(605401.0, 4168784.0,	127.0,	127.0,	0.0);	(606905.0, 4170429.0,	139.4,	139.4,	0.0);

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[illegible]

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

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F indicates top of profile (=1) or below (=0)

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Y-COORD (METERS)	602836.00	602886.00	602936.00	602986.00	603036.00	603086.00	603136.00	603186.00	603236.00
4171471.00	0.00268	0.00276	0.00283	0.00291	0.00299	0.00306	0.00314	0.00323	0.00332
4171421.00	0.00273	0.00280	0.00289	0.00297	0.00305	0.00313	0.00322	0.00330	0.00339
4171371.00	0.00277	0.00285	0.00294	0.00303	0.00311	0.00319	0.00328	0.00338	0.00347
4171321.00	0.00281	0.00291	0.00299	0.00308	0.00317	0.00326	0.00336	0.00346	0.00355
4171271.00	0.00286	0.00295	0.00305	0.00314	0.00323	0.00333	0.00344	0.00354	0.00364
4171221.00	0.00290	0.00300	0.00310	0.00320	0.00330	0.00341	0.00351	0.00362	0.00372
4171171.00	0.00295	0.00305	0.00315	0.00325	0.00336	0.00348	0.00359	0.00370	0.00381
4171121.00	0.00299	0.00310	0.00321	0.00331	0.00343	0.00355	0.00367	0.00379	0.00390
4171071.00	0.00304	0.00315	0.00326	0.00337	0.00350	0.00362	0.00374	0.00387	0.00400
4171021.00	0.00309	0.00321	0.00332	0.00343	0.00355	0.00368	0.00382	0.00395	0.00408
4170971.00	0.00314	0.00326	0.00337	0.00349	0.00362	0.00375	0.00389	0.00403	0.00417
4170921.00	0.00321	0.00331	0.00343	0.00356	0.00369	0.00382	0.00396	0.00411	0.00427
4170871.00	0.00328	0.00339	0.00350	0.00361	0.00374	0.00389	0.00404	0.00420	0.00437
4170821.00	0.00334	0.00345	0.00355	0.00367	0.00381	0.00396	0.00413	0.00430	0.00449
4170771.00	0.00341	0.00352	0.00363	0.00375	0.00389	0.00404	0.00422	0.00442	0.00460
4170721.00	0.00347	0.00359	0.00371	0.00383	0.00397	0.00412	0.00429	0.00448	0.00470
4170671.00	0.00354	0.00367	0.00380	0.00392	0.00405	0.00420	0.00438	0.00457	0.00477
4170621.00	0.00362	0.00374	0.00388	0.00400	0.00412	0.00429	0.00447	0.00467	0.00488
4170571.00	0.00369	0.00383	0.00396	0.00407	0.00421	0.00438	0.00458	0.00479	0.00503
4170521.00	0.00376	0.00390	0.00404	0.00416	0.00431	0.00449	0.00472	0.00493	0.00516
4170471.00	0.00385	0.00399	0.00413	0.00427	0.00443	0.00463	0.00484	0.00505	0.00529
4170421.00	0.00392	0.00411	0.00427	0.00443	0.00458	0.00478	0.00498	0.00521	0.00545
4170371.00	0.00402	0.00427	0.00444	0.00456	0.00471	0.00490	0.00512	0.00535	0.00560
4170321.00	0.00410	0.00432	0.00453	0.00471	0.00488	0.00503	0.00526	0.00550	0.00576
4170271.00	0.00422	0.00441	0.00460	0.00482	0.00501	0.00521	0.00544	0.00570	0.00596
4170221.00	0.00435	0.00452	0.00471	0.00493	0.00513	0.00536	0.00559	0.00587	0.00617
4170171.00	0.00444	0.00463	0.00481	0.00504	0.00527	0.00550	0.00578	0.00604	0.00634
4170121.00	0.00432	0.00475	0.00494	0.00515	0.00541	0.00566	0.00594	0.00625	0.00655
4170071.00	0.00440	0.00488	0.00509	0.00531	0.00555	0.00583	0.00611	0.00644	0.00680
4170021.00	0.00452	0.00503	0.00524	0.00547	0.00572	0.00602	0.00632	0.00664	0.00701
4169971.00	0.00465	0.00518	0.00542	0.00566	0.00592	0.00622	0.00654	0.00689	0.00725
4169921.0									

*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013
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*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): LAKEB , AREA_A ,

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

** CONC OF GENERIC IN MICROGRAMS/M**3 **

Y-COORD (METERS)	605086.00	605136.00	605186.00	605236.00	605286.00	605336.00	605386.00	605436.00	605486.00
4169471.00	0.06107	0.05869	0.05637	0.05418	0.05210	0.05014	0.04837	0.04657	0.04494
4169421.00	0.06524	0.06252	0.05988	0.05741	0.05507	0.05288	0.05082	0.04894	0.04708
4169371.00	0.06956	0.06637	0.06341	0.06073	0.05819	0.05581	0.05352	0.05145	0.04944
4169321.00	0.07435	0.07074	0.06737	0.06431	0.06145	0.05878	0.05640	0.05414	0.05199
4169271.00	0.07950	0.07533	0.07140	0.06806	0.06492	0.06200	0.05946	0.05710	0.05475
4169221.00	0.08170	0.07786	0.07531	0.07166	0.06773	0.06566	0.06287	0.06027	0.05774
4169171.00	0.08785	0.08282	0.07859	0.07467	0.07167	0.06971	0.06677	0.06381	0.06109
4169121.00	0.09524	0.09026	0.08525	0.08047	0.07578	0.07433	0.07086	0.06774	0.06470
4169071.00	0.10474	0.09872	0.09272	0.08741	0.08245	0.07919	0.07564	0.07202	0.06853
4169021.00	0.11365	0.10672	0.10034	0.09449	0.08932	0.08480	0.08068	0.07668	0.07274
4168971.00	0.12240	0.11490	0.10826	0.10173	0.09599	0.09102	0.08628	0.08160	0.07716
4168921.00	0.12320	0.12329	0.11566	0.10877	0.10288	0.09737	0.09206	0.08684	0.08190
4168871.00	0.14282	0.13299	0.12418	0.11667	0.10922	0.10424	0.09833	0.09252	0.08702
4168821.00	0.15359	0.14315	0.13387	0.12511	0.11688	0.11148	0.10501	0.09870	0.09260
4168771.00	0.16655	0.15446	0.14425	0.13500	0.12588	0.11950	0.11240	0.10532	0.09863
4168721.00	0.18184	0.16850	0.15620	0.14600	0.13588	0.12803	0.12060	0.11262	0.10525
4168671.00	0.20119	0.18681	0.17124	0.15888	0.14600	0.13766	0.12980	0.12108	0.11261
4168621.00	0.22792	0.20768	0.19046	0.17544	0.16000	0.15168	0.14108	0.13079	0.12086
4168571.00	0.26911	0.24012	0.21683	0.19733	0.17877	0.16775	0.15470	0.14213	0.12991
4168521.00	0.33889	0.29460	0.25681	0.22887	0.20288	0.18871	0.17162	0.15535	0.14043
4168471.00	0.39032	0.36232	0.32665	0.28355	0.24377	0.21808	0.19341	0.17166	0.15248
4168421.00	0.42330	0.40499	0.38030	0.35044	0.31500	0.28762	0.22449	0.19164	0.16671
4168371.00	0.43697	0.42616	0.41159	0.39155	0.36572	0.34010	0.26249	0.21411	0.18142
4168321.00	0.43668	0.43078	0.42437	0.41316	0.39364	0.37775	0.29337	0.23375	0.19502
4168271.00	0.42976	0.42692	0.42637	0.41687	0.40332	0.38853	0.31062	0.24753	0.20577
4168221.00	0.41823	0.42034	0.41796	0.41153	0.40117	0.38803	0.31880	0.25523	0.21263
4168171.00	0.39940	0.40058	0.40547	0.40042	0.38836	0.37438	0.31872	0.25774	0.21541
4168121.00	0.37067	0.37658	0.37940	0.38346	0.37513	0.36175	0.31458	0.25449	0.21452
4168071.00	0.32692	0.34521	0.35733	0.36266	0.35720	0.34379	0.30444	0.24696	0.20882
4168021.00	0.25570	0.28835	0.31150	0.33021	0.33130	0.32207	0.29261	0.23413	0.19907
4167971.00	0.18878	0.20688	0.23178	0.26173	0.27930	0.28268	0.26863	0.21510	0.18450
4167921.00	0.14295	0.15092	0.16014	0.17165	0.18541	0.19773	0.21269	0.18441	0.16519
4167871.00	0.11125	0.11486	0.11865	0.12254	0.12719	0.13443	0.14605	0.14794	0.14190
4167821.00	0.08931	0.09145	0.09381	0.09666	0.10058	0.10635	0.11349	0.11879	0.11975
4167771.00	0.07377	0.07556	0.07771	0.08045	0.08408	0.08866	0.09380	0.09862	0.10154
4167721.00	0.06238	0.06416	0.06631	0.06897	0.07220	0.07594	0.07999	0.08394	0.08713
4167671.00	0.05361	0.05540	0.05752	0.06001	0.06288	0.06610	0.06946	0.07281	0.07582
4167621.00	0.04667	0.04846	0.05050	0.05281	0.05536	0.05812	0.06100	0.06389	0.06663
4167571.00	0.04096	0.04270	0.04463	0.04676	0.04906	0.05151	0.05404	0.05659	0.05905
4167521.00	0.03621	0.03787	0.03969	0.04166	0.04374	0.04592	0.04818	0.05045	0.05268

Project Maximum
Incremental Annual
Average
Concentration of
PM2.5 at Nearest
Home Reported in
Table 3

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*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc *** 06/15/20
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013 *** 11:08:38
                                                                                                     PAGE 63
*** MODELOPTs:      NonDEFAULT  CONC  FLAT and  ELEV  URBAN

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*** THE ANNUAL AVERAGE CONCENTRATION      VALUES AVERAGED OVER    5 YEARS FOR SOURCE GROUP: ALL      ***
      INCLUDING SOURCE(S):      LAKEB          , AREA A          ,

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*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF GENERIC IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
605404.00	4169223.00	0.06177	605631.00	4168311.00	0.13392
605401.00	4168784.00	0.10836	606905.00	4170429.00	0.01204

*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013
*** MODELOPTs: NonDEFAULT CONC FLAT and ELEV URBAN

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*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF GENERIC IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR	(XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID			
ALL	1ST HIGHEST VALUE IS	0.50908 AT (	603986.00,	4168871.00,	132.30,	147.00,	0.00)	GC	UCART1
	2ND HIGHEST VALUE IS	0.50039 AT (	604836.00,	4168521.00,	128.70,	128.70,	0.00)	GC	UCART1
	3RD HIGHEST VALUE IS	0.49621 AT (	604836.00,	4168571.00,	131.30,	134.00,	0.00)	GC	UCART1
	4TH HIGHEST VALUE IS	0.49193 AT (	604086.00,	4168871.00,	130.70,	147.00,	0.00)	GC	UCART1
	5TH HIGHEST VALUE IS	0.48448 AT (	604786.00,	4168521.00,	126.50,	134.00,	0.00)	GC	UCART1
	6TH HIGHEST VALUE IS	0.48392 AT (	604886.00,	4168521.00,	127.70,	127.70,	0.00)	GC	UCART1
	7TH HIGHEST VALUE IS	0.48131 AT (	604786.00,	4168571.00,	127.20,	134.00,	0.00)	GC	UCART1
	8TH HIGHEST VALUE IS	0.47451 AT (	604736.00,	4168521.00,	125.20,	125.20,	0.00)	GC	UCART1
	9TH HIGHEST VALUE IS	0.47442 AT (	604086.00,	4168921.00,	129.90,	147.00,	0.00)	GC	UCART1
	10TH HIGHEST VALUE IS	0.47251 AT (	603986.00,	4168921.00,	131.10,	147.00,	0.00)	GC	UCART1

*** RECEPTOR TYPES: GC = GRIDCART
 GP = GRIDPOLR
 DC = DISCCART
 DP = DISCPOLR

*** AERMOD - VERSION 19191 *** *** C:\Lakes\AERMOD View\Eliot2\Eliot2.isc
*** AERMET - VERSION 14134 *** *** Elliot Quarry Annual PM-2.5 Livermore Met Data 2009-2013

*** 06/15/20
*** 11:08:38
*** PAGE 65

*** MODELOPTs: NonDEFAULT CONC FLAT and ELEV URBAN

*** Message Summary : AERMOD Model Execution ***

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)
A Total of 3 Warning Message(s)
A Total of 15235 Informational Message(s)

A Total of 43872 Hours Were Processed

A Total of 13448 Calm Hours Identified

A Total of 1787 Missing Hours Identified (4.07 Percent)

***** FATAL ERROR MESSAGES *****
*** NONE ***

***** WARNING MESSAGES *****
CO W320 23 URB-POP
RE W213 2254 RECAP: ELEV Input Inconsistent With Option: Input Ignored UCART1
MX W481 43873 MAIN: Data Remaining After End of Year. Number of Hours= 48

*** AERMOD Finishes Successfully ***
