Letter No. E1

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

E-mailed: January 21, 2011
ovov@planning.lacounty.gov

January 21, 2011

Mr. Mitch Glaser
Department of Regional Planning
320 Temple Street
County of Los Angeles
Los Angeles, CA 90012

FEB 22 2011

Review of the Re-circulated Draft Environmental Impact Report (Draft EIR) for the Santa Clarita Valley Area Plan Update

The South Coast Air Quality Management District (AQMD) appreciates the opportunity to comment on the above-mentioned document. The following comment is intended to provide guidance to the lead agency and should be incorporated into the final Environmental Impact Report (final EIR) as appropriate. 1

Based on a review of the draft EIR the AQMD staff is concerned about the project's operational air quality impacts. Specifically, the lead agency has determined that the project's operational phase will exceed the AQMD's CEQA significance thresholds resulting in significant regional and cumulative air quality impacts. The project's operational air quality impacts are primarily from mobile source emissions related to the significant increase of vehicle trips (>1.8 million) associated with the proposed project. 2 AQMD staff appreciates that this plan update, in conjunction with the Santa Clarita City General Plan update, encourages more dense development in already developed areas in Santa Clarita in order to reduce transportation and related air quality impacts. 3 However, the lead agency has not stipulated specific measures or targets to reduce the large increase in mobile source emissions allowed under the proposed project. 4 For example, the Southern California Association of Governments (SCAG) has adopted regional greenhouse gas (GHG) emission reduction targets under SB 375 of 8% by 2020 and 13% 2035. A reduction in GHGs will very likely provide co-benefits by reducing criteria pollutant emissions. Therefore, the AQMD staff recommends that the lead agency include quantitative targets and/or performance standards for the development of this plan in order to minimize the project's significant air quality impacts. Potential quantifiable mitigation measures are included in the greenhouse gas quantification report[1] published by the California Air Pollution Control Officer's Association in the final EIR. 5

Further, the AQMD staff is concerned about the potential health risk impacts to future sensitive receptors (i.e., schools, school yards, parks, playgrounds, day care centers, 6

[1] California Air Pollution Control Officer's Association. August 2010. Quantifying Greenhouse Gas Mitigation Measures. Accessed at: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

nursing homes, hospitals, and residential communities) from potential sources of toxic emissions within the project boundaries. For example, Figure 3.1-2 and 3.1-3 in the draft EIR indicates that residential uses will be located adjacent to light industrial uses. Therefore, the AQMD staff recommends that the lead agency include mitigation in the final EIR that is consistent with the advisory recommendations listed in Table 1-1 of the Air Quality and Land Use Handbook[2] developed by the California Air Resources Board. Further, the AQMD staff requests that the lead agency include mitigation in the final EIR that requires any future project with sensitive land uses located in close proximity to an industrial use (i.e., source of toxic pollutants) to conduct a health risk assessment. 6 7 8 9

Pursuant to Public Resources Code Section 21092.5, please provide the AQMD with written responses to all comments contained herein prior to the adoption of the final EIR. Further, staff is available to work with the lead agency to address these issues and any other questions regarding air quality that may arise. Please contact Dan Garcia, Air Quality Specialist CEQA Section, at (909) 396-3304, if you have any questions regarding the enclosed comments. 10

Sincerely,

Ian MacMillan
Program Supervisor, CEQA Inter-Governmental Review
Planning, Rule Development & Area Sources

Attachment

IM:DG

LAC101123-05
Control Number

[2] California Air Resources Board. April 2005. "Air Quality and Land Use Handbook: A Community Health Perspective." Accessed at: http://www.arb.ca.gov/ch/landuse.htm

Letter No. E2

SCOPE
Santa Clarita Organization for Planning and the Environment
TO PROMOTE, PROTECT AND PRESERVE THE ENVIRONMENT, ECOLOGY
AND QUALITY OF LIFE IN THE SANTA CLARITA VALLEY
POST OFFICE BOX 1182, SANTA CLARITA, CA 91386

2-7-11

Los Angeles County Regional Planning Commission
Mr. Mitch Glaser, Supervising Regional Planner
320 W. Temple St.
Los Angeles, CA 90012

Re: Santa Clarita Area Plan Update R2007-0126, Plan Amendment 2009-0006 and associated permits – One Valley One Vision

Dear Commissioners and Mr. Glaser:

We would like to begin by expressing our concern over the choice of Impact Sciences to produce the EIR for this General Plan update. Impact Sciences is the same firm that prepared all the environmental documents for the Newhall Land projects along the Santa Clara River, both in the City of Santa Clarita and for the County, including the environmental documentation for the Newhall Ranch Project. During the last ten years, their biological consultants somehow forgot to disclose the spineflower in the Newhall Ranch area where Newhall Land was later fined for destroying this rare plant. They failed to find several rare bird species and amphibian species in Newhall Ranch and in other projects that were discovered by others later. In the past, the biologists have been forced to sign confidentiality agreements with the developer promising not to disclose to others any of their work for this firm. (Why would one need such an agreement if all the surveys and creatures discovered are accurately disclosed in the environmental document?) 1

Other impacts are consistently downplayed or obscured. While it may be that Impact Sciences does not have complete control over the choice of consultants used for the DEIR, as prime contractor, they or the County should exercise oversight as to the quality of the material submitted. Inaccurate information fails to provide the decision-makers with the facts they need and discourages the public from participating.

Also, a document that contains some 10,000 pages (including appendices) is so voluminous that the controversy is "hidden in plain sight". 2

We assert that agencies should not be allowed to hire consultants to work on a general plan update when those consultants are also working for the major developers who have much to benefit or lose if the plan doesn't go their way. This is the situation in both the General Plan Update (OVOV) and CLWA's proposed consultants for their 2010 Urban Water Management Plan. At the very least, consultants should be required to disclose any such conflicts.

Two Separate EIR Processes

The Executive Summary describes this project in the following manner: 3

> "One Valley One Vision (OVOV) is a joint effort between the County of Los Angeles (County), City of Santa Clarita (City), and Santa Clarita Valley (Valley) residents and businesses to create a single vision and set of guidelines for the future growth of the Valley and the preservation of natural resources. Realizing that development within both jurisdictions can have regional implications, the County and City have jointly endeavored to prepare planning policies and guidelines to guide future development within the Santa Clarita Valley."[1]

3

If this is truly an accurate description, we wonder why the public must be subjected to two separate processes, one for the City of Santa Clarita and one for the County of Los Angeles, as well as two extensive detailed and entirely separate EIRs. Such a duplicative and time-consuming process is extremely onerous for the public, who must read thousands of pages of materials, compare them to find differences or conflicts, make two sets of written comments and attend two sets of public hearings.

Such an onerous and time-consuming public process serves to discourage public participation in this most important of land use approvals. It is also unnecessary. Concurrent hearings on EIRs and EISs is a common occurrence between the California Dept. of Fish and Game and the Army Corps of Engineers on issues regarding the river system in the Santa Clarita Valley. If these two entities are able to work together to reduce the burden on the public of reviewing two separate documents certainly the County and the City of Santa Clarita could have accomplished this as well.

4

A dual process does not meet the stated objective of this Plan, i.e. "Foster public participation in the planning process for the Area Plan"[2]. We therefore continue to request that these two processes be merged, the EIRs combined and all public hearings be held concurrently in order to allow the general public to be more effectively involved.

5

Elimination or Obscuring of the Development Monitoring System

County Urban Expansion Areas such as the Santa Clarita Valley are subject to the County's Development Monitoring System (DMS). The DMS is a General Plan Amendment (SP 86-173) that was authorized by the Board of Supervisors on April 21st, 1987.

The DMS came into existence as a settlement agreement to resolve public interest litigation brought by the Center for Law and the Public Interest over the proposed increase in population projections in the 1987 General Plan. As a Court ordered Amendment instituted as settlement, the County cannot ignore it, pretend it doesn't exist or make it go away.

6

This litigation was brought on behalf of the public under a situation exactly similar to the one we have today, i.e., the County was proposing a huge population increase without sufficient infrastructure to support it. The population projection will then enable extensive additional housing approvals because the "Plan" will project inadequate housing for this enormous increase that is not supported by sufficient infrastructure including schools, fire service, roads, sewers, water supply and libraries to support this enormous increase.

[1] P.1.0.-1
[2] Executive Summary, p. ES-2

Developed with the overview of James Kushner acting as Court referee, the DMS aimed to address these infrastructure needs. In an article written by Mr. Kushner, he stated:

> "The Los Angeles County Development Monitoring System (DMS) utilizes computer technology to determine capital facility supply capacity and demand placed upon that system by each approved and proposed development. The computer warns decision-makers when demand exceeds capacity and instructs planners on system capacity expansion to meet projected demand."[3]

In other words, if there aren't enough school classrooms to serve the new development, the project must be downsized, delayed or denied until there are. This also goes for sewer capacity, library facilities, water, roads and fire service. For some reason, sheriff's services were left out. SCOPE believes the County should take this opportunity to up date the DMS to include the sufficiency of sheriff services for new developments.

6

We are informed that eliminating the Development Monitoring System would make the Area Wide Plan inconsistent with the General Plan and that the County is not proposing to do this. However, we cannot find this important part of the General Plan clearly stated in the OVOV Plan. It is important for both the decision-makers, planners and the public that this part of the General Plan be clearly outlined.

Such a failure to disclose the DMS requirement clearly benefits one developer and one project in particular, i.e., Newhall Land and Development Co. and their Newhall Ranch project. That is because litigation on the Specific Plan resolved the questions related to compliance with the DMS by stating that each tract will be evaluated for DMS compliance at the tract map stage.[4] Elimination or failure to disclose the existence of the DMS would therefore not only be inconsistent and fail to inform decision makers regarding the LA County General Plan, but also benefit Newhall Land's continued efforts to entitle tracts under the Newhall Ranch Specific Plan which must be consistent with the Court Order.

Population

The proposed General Plan updates for both the City of Santa Clarita and surrounding County areas are based on a large projected population increase, over double our current population, during the next decade. Such a projection will require densification and subsequent zoning changes that will increase property values for developers, but could destroy the quality of life in many neighborhoods.

7

Such projections are nothing new. We thought it might be interesting to submit into the record a portion of an editorial by Michael Kotch, a former SCOPE president, written in 1996.

> *"When the Southern California Association of Governments (SCAG) and the Population Planning Section of the County's Regional Planning Dept. issue massive growth projections for our valley – and when county and city decision makers (or others such as school or water*

[3] "Zoning and Planning Law Report", May 1988
[4] Statement of Decision of Judge Roger Randall, Kern Case 238324-RDR, 2000, Page 32

boards) accept these projections without scrutiny – the first question should be, "What they heck are they smoking?"

If SCAG or another agency of government states that there will be 500,000 people in this valley by 2010, (and not the previous 270,000 predicted in the last plan update) many landuse decision makers and utility planners scurry to convert this tentative, speculative, unproven guestimate, into a goal "SCAG has spoken, we must follow blindly"

Suddenly we are considering increased urban landuses and increasing expensive infrastructure to support the goal. Even if the emperor is on parade without clothes.

A rational and sober analysis on this new "goal" for the Santa Clarita Valley follows:

- *We have today about 170,000 people living here in 56,700 dwellings.*
- *To achieve 500,000 people in this valley by 2010 requires that we, starting today, sell 20 new homes per day. A local real estate broker reported that 20 new units sold in a month is more typical. That's far short of the goal.*
- *Our growth rate in the "booming 80s" was 5 percent a year. To achieve 270,000 we have to grow about 4% per year. Growth in the Santa Clarita Valley was 2% per year over the past six years. Achieving 270,000 is plausible, but will not happen if our economy stays flat.*
- *Housing 500,000 requires a 13% growth rate – a rate nearly three times that experienced in the expansive 80's."*

7

Now, almost 15 years after Kotch wrote this analysis, his words ring true. Even with the rapid growth that occurred prior to the housing downturn, we have not reached even the 270,000 predicted in the last general plan update of 1993, far less the 500,000 that SCAG began pushing in 1996. Estimates for current population in the SCV are around 252,000 (Draft OVOV Plan, page 3.19-1). The City of Santa Clarita states that the growth rate between 2000 and 2008 was just over 17% or slightly over 2% a year[5], again, not anywhere near the projected growth rate that would put us over the 500,000 people projected by our new "One Valley One Vision"

So where does this number come from? SCAG calculates a fairly accurate increase in population for LA County, but where that population will go is entirely arbitrary. Regional projections are determined by what cities push for at the regional level. The "Northern Subregion" is then arbitrarily given a population figure based in large part on lobbying efforts by the development community and the cities. It is then arbitrarily divided again into growth for the Antelope Valley and growth for the Santa Clarita Valley. The projections must be high, because General Plans will fail to pass legal hurdles if they support growth in excess of SCAG projections.

8

Whom does such a large projection benefit and who does it hurt? It benefits developers, engineering firms, concrete contractors, anyone that would have to supply public services to support such a large projection.

9

It hurts the taxpayer who must pay for all that expansion even though the actual people most likely will not arrive. It will be reflected in tax increases, water and sewer charge increases,

[5] See the City's website: (www.santa-clarita.com/cityhall/cd/ed/community_profile/2007deomographics//population.asp#poplation

moneys spent to expand schools that may in fact be unneeded. It will hurt the environment by promoting and "visioning" expansion beyond our carrying capacity. Santa Clarita has some of the worst air pollution in the nation. More cars and more vehicle trips will add to that. We do not have enough water for all these people. Traffic levels already at level D, cannot be mitigated in many areas and will simply fall to unacceptable levels of E and F. And it hurts future generations because zoning approved based on this huge number precludes changes by future generations to fit new ideas and new needs. 9

Obviously someone has made a mistake. We would not have some 39, 500[6] approved but unbuilt units if all that housing were really needed. We would not have several specific plans that are approved but unbuilt. We would not have so many vacant commercial buildings. 10

The County supports this huge population projection based on several goals and policies that will encourage infill and transit oriented projects. For example, the Plan purposes to address and mitigate this huge population increase by policies such as**:** 11

> ***"Policy CO 3.1.1:*** *On the Land Use Map and through the development review process, concentrate development into previously developed or urban areas to promote infill development and prevent sprawl and habitat loss, to the extent feasible."*

These policies and goals are patently absurd. First, the number of previously approved specific plans, including Newhall Ranch, North Lake and others, preclude compliance with this policy. Second, the County has already shown bad faith with its intention to comply with such policies by granting density upgrades to several developers who appeared at the public hearing and by approving the 1260 unit Skyline Ranch, an auto-oriented sprawl project on the far eastern fringe of the Santa Clarita Valley. Third, weak language throughout the policies and goals such as "encourage", "promote" and, as in the example above "to the extent feasible" make the goals and policies unenforceable. 12

Recommendations

We believe that this over-stated population projection must be revised downward to conform to reality and the current state of the economy. We also urge the County to re-evaluate these projections based on the REAL census data that will be available later this year. Approvals for unbuilt tracts and specific plans should be allowed to expire so that new approvals will comply with updated laws and address existing needs. 13

Water Supply

The 2005 Urban Water Management Plan is out-dated. New requirements by the legislature were imposed by SBX7 updating disclosure requirements and water conservation goals.

The new UWMP for our valley is in process. The County should work with local water agencies to ensure that the most up to date information is included in the OVOV document and incorporate in the plan as a policies and goals all best management practices for water conservation in its document. 14

Imported Water Supply

One area of general concern is the continued availability of imported state water supplies from the Sacramento Delta. State Water was never meant to be a primary source of supply due to its 15

[6] DEIR, 3.19-3

unreliability. The existing Santa Clarita Area Plan encourages "use of imported water to relieve overdrafted groundwater basins and maintain their safe yield for domestic uses outside of urban areas."[7] This policy is in line with the primary purpose of State Water supply, i.e. to act as a supplemental water supply to alleviate ground water over draft. It is also confirmed in the current draft plan on page 129 which states "CLWA was formed in 1962 for the purpose of contracting with the California Department of Water Resources (DWR) to provide a supplemental supply of imported water to the water purveyors in the Valley."

15

However, for some time Santa Clarita Valley residents have in fact consumed more imported state water than local ground water due to housing approvals that have out stripped the capacity of the local aquifers.[8] The statement found in the Plan on page 130 "Local water retailers currently pump over 50 percent of the domestic water supply from groundwater aquifers" **is incorrect and does not accurately represent the current situation.**

As part of the comprehensive water bill SBX7 (November 2009) the California State Legislature required the development of flow criteria needed to maintain the Sacramento River Delta ecosystem. On August 3, 2010, the State Water Board adopted Resolution 2010-0039 approving the final report[9] determining new flow criteria for the Delta ecosystem necessary to protect public trust resources. This information is important to decision makers in Southern California because the flow criteria indicate more water is needed to support a sustainable Delta fishery. This means reduced exports to Southern California.

16

The DEIR contains an extensive discussion of this report beginning at page 3.13-86. Rather than summarize the report and include the report in the Appendices, the consultant spends numerous pages expounding on why, in his opinion, the report's information is not important. This report, as well as an accurate summary of the information it contains, should be included in the DEIR and in the appendices, made available to the decision makers and circulated to all interested parties to this application. We hereby include it by reference. (see footnote)

Overdraft of the Santa Clara River

Overdraft of the alluvial aquifer has been at issue for many years. While water agencies and other developers such as Newhall Land and Farming argued that the Santa Clara River was not in a state of overdraft, downstream users including United Water Conservation District and Ventura County remain skeptical and concerned. They withdrew their objections only after a Memorandum of Understanding[10] was signed, agreeing to ground water monitoring in which United Water Conservation District would participate.

17

The DEIR does not give an accurate view of the full extent of ground water pumping in the Upper Santa Clara Basin. For example, the ground water pumping chart on page 3.13-34 leaves off pumping by Newhall Land and Farming, and other private users as disclosed in the 2009 Water Supply Report in the appendices. This chart makes it appear that only around 40% of the alluvial aquifer is currently utilized while in fact, the alluvial aquifer is fully utilized. (See ground

[7] Santa Clarita Valley Areawide Plan, 1984, page 23 Public Services and Facilities Element, Water Supply 1.2
[8] see 2009 Annual Water Report, page ES-2, Appendix 3.13
[9] http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf
[10] MOU between the Santa Clarita Water Agencies and United Water Conservation District, August 2001

water production chart – all users 2009 Annual Water Report[11]). Why is this information not in the main body of the document? This information should be included. 17

The local well owners' association has long complained that private pumping is underestimated in ground water documents and have expressed concern that the viability of their wells may be affected by additional pumping[12]. 18

Further, there is considerable biological evidence that overdraft of the Santa Clara River exists, particularly in the upper reaches. The die back of vegetation away from the center of the streambed in the upper reaches is a prime indication of such overdraft as described in USGS "Sustainability of Ground Water Resources", Circular 1186[13]. **No studies exist to evaluate this impact and it is not discussed in the DEIR.** 19

Also, no study of subsidence or reductions in water quality, both indications of groundwater overdraft, has ever been conducted for the Upper Santa Clara Basin.

These omissions become even more disturbing upon reading in the EIR/EIS for the Newhall Land's Santa Clara River 404 permit (Also produced by Impact Sciences, the same consultant who wrote this EIR):

> "Groundwater quality is a key factor in assessing the Alluvial aquifer as a municipal and Agricultural water supply. In terms of the aquifer system, there is no convenient long-term record of water quality, (*i.e.*, water quality data in one or more single wells that spans several decades and continues to the present). Thus, in order to examine a long-term record of water quality in the Alluvium, individual records have been integrated from several wells completed in the same aquifer materials and in close proximity to each other to examine historical trends in general mineral groundwater quality throughout the basin. Based on these records of groundwater quality, wells within the Alluvium have experienced historical fluctuations in general mineral content, as indicated by electrical conductivity (EC), which correlates with fluctuations of individual constituents that contribute to EC. The historic water quality data indicates that, on a long-term basis, there has not been a notable trend and, specifically, there has not been a decline in water quality within the Alluvium. 20
>
> Specific conductance within the Alluvium exhibits a westward gradient, corresponding with the direction of groundwater flow in the Alluvium. EC is lowest in the easternmost portion of the Basin, and highest in the west. Water quality in the Alluvium generally exhibits an inverse correlation with precipitation and streamflow, with a stronger correlation in the easternmost portion of the Basin, where groundwater levels fluctuate the most. Wet periods have produced substantial recharge of higher quality (low EC) water, and dry periods have resulted in declines in groundwater levels, with a corresponding increase in EC (and individual contributing constituents) in the deeper parts of the Alluvium."[14]

This information was not included in this DEIR, although these facts were well known to this DEIR consultant. Why was it omitted? This statement seems to be saying that everything is fine

[11] Appendix 3.13
[12] See comment letters, Newhall Ranch Specific Plan and Landmark Village from Santa Clarita Valley Well Owners Association, available in LA County and CLWA files, produced upon request.
[13] Whole document can be viewed at pubs.usgs.gov/circ/circ1186 Relevant section is "Effects of Ground water Development on Ground water Flow – Streams", see especially pg. 5 of pdf attachment
[14] DEIR/EIS prepared by Impact Sciences for the Santa Clara River Federal 404 permit and State Fish and Game Dept. River Alteration permit, released April 2009, page 4.3-57

only as long as past precipitation trends continue, but that drought particularly causes a problem in the eastern portions of the basin. The discussion continues:

> "Similar to the Alluvium, groundwater quality in the Saugus Formation is a key factor in assessing that aquifer as a municipal and agricultural water supply. As with groundwater level data, long-term Saugus groundwater quality data is not sufficiently extensive (few wells) to permit any basinwide analysis or assessment of pumping-related impacts on quality. As with the Alluvium, EC has been chosen as an indicator of overall water quality, and records have been combined to produce a long-term depiction of water quality. Water quality in the Saugus Formation has not historically exhibited the precipitation-related fluctuations seen in the Alluvium. Based on the historical record over the last 50 years, groundwater quality in the Saugus has exhibited a slight overall increase in EC. More recently, several wells within the Saugus Formation have exhibited an additional increase in EC similar to that seen in the Alluvium."[15]

20

This section states that both the Saugus Aquifer and the Alluvial Aquifer are exhibiting some increase in EC indicative of ground water overdraft. There is no discussion of the well-established connectivity of the Alluvial and Saugus aquifers. Since re-charge of the Saugus aquifer depends at least in part of the alluvial aquifer, re-charge to the Saugus will be reduced by over-draft of the alluvium.

A further indication of potential problems and misinformation is provided by the two citations below from Castaic Lake Water Agency's (CLWA) submittal to the Dept. of Health Services for permission to put water from the polluted Saugus well filtration process back into the drinking water system after treatment.

CLWA states at page 7 of the Engineering Report Executive Summary[16]:

> *"It should also be noted that, per the 2005 Urban Water Master Plan (UWMP), given a single dry year there would be insufficient capacity from the existing and planned local, wholesale, and banked supplies to meet future needs of CLWA and the other purveyors without incorporating the restoration of Saugus 1 and 2."*

21

and at page 7-20 of its Engineering Report"

> *"It should also be noted that, as investigated in the UWMP, all alternative purveyors identified in this assessment are approaching their maximum groundwater withdrawal capacity and, therefore, may not be able to provide supplemental water to the Agency in order to meet their expected demand."*

Aquifer Protection

We understand that the identification of ground water re-charge areas will be included in the County plan. Policies ensuring that permeable pavement and other practices for the catchment of stormwater for recharge should be included as goals and policies of the plan. The consistent use of the word "promote" in the Plan policy language is not adequate as planners and commissioners can easily ignore it.

22

The existing County Areawide Plan (last updated in 1990) for the Santa Clarita Valley has several sections that provide goals and policies for aquifer protection as follows:

Page 23

[15] *Ibid.*, page 4.3-59-60

[16] DPH Policy Memo 97-005 Compliance Report, Dec. 2009, Black and Vetch Engineering, Document attached

Public Services and Facilities Element
Water Supply

1.1 Develop and use groundwater sources to their safe yield limits, but not to the extent that degradation of the groundwater basins occurs.

1.2 Use of imported water to relieve overdrafted groundwater basins and maintain their safe yield for domestic uses outside of urban areas.

Page 24

Flood control Drainage

3.1 Use floodways for recreation where feasible. Floodway recreational uses should be limited to those not requiring structures or improvements that could obstruct the natural flow of floodwater.

Page 25

Environmental Resources Management Element
Natural Resources

1.4 Protect the viability of surface water, since it provides a habitat for fish and other water-related organisms, as well as being an important environmental component for land based plants and animals.

Page 26

Managed Resource Production

3.1 Maintain, where feasible, aquifer recharge zones to assure water quality and quantity.

22

The DEIR contains no analysis of loss of recharge due to fill and compaction of the flood plains allowed by the plan. Instead the consultant promotes the absurd hypothesis that urban development and hardscaping increases ground water recharge. This concept runs afoul of hundreds of reports produced by agencies from the US EPA and USGS to the Los Angeles and San Gabriel Watershed Council.

23

The new Plan should include similar language to protect the floodplain, natural waterways and tributaries as well as the Santa Clara River as a means of ensuring the sustainability of our local water supply.

Recommendations for Plan Goals and Policies regarding water supply

We support the strong goals and policies for water conservation and efficiency in the plan.

However, we believe that the plan must include the four listed policies above found in the 1984 Areawide Plan. Strong language to protect mapped groundwater recharge areas should also be included so that Santa Clarita communities can move towards Regional water supply reliance as imported water is impacted by efforts to restore the Delta fisheries and climate change.

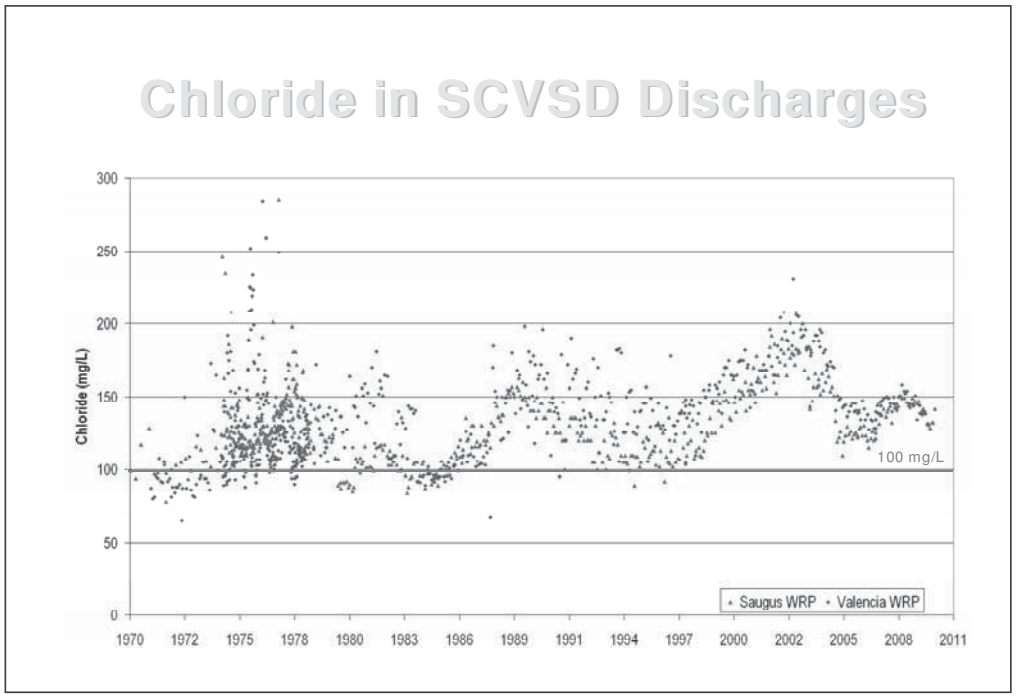
24

Water Quality - WasteWater

Chlorides

Currently the Sanitation Districts 26 and 32 in the Santa Clarita Valley do not comply with the Clean Water Act Total Maximum Daily Load (TMDL) effluent standard of 100 ugl of Chloride as indicated by the chart below supplied at a recent Sanitation District public hearing:

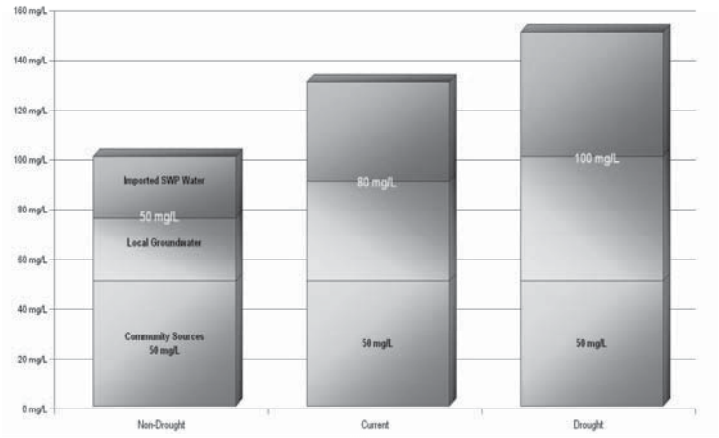
25



25

The Santa Clarita Sanitation Districts' failure to meet the Clean Water TMDL standard for chloride of 100mg/l in the Santa Clara River is a result in part to the sharp and continuing increase in the use of imported State Water Project (SWP) water as seen by the chart below, (from the Sanitation Districts).

Chloride Sources During
Drought & Non-Drought Conditions



This problem may be further aggravated by high levels of chlorides found in wells in certain areas of the Santa Clarita Valley used to supply future development. Overdrafting of the groundwater aquifers to supply proposed Plan development will also result in a reduction in water quality as described above under water supply. This fact is also re-enforced by the chloride level chart indicating lower chloride levels during periods of high rainfall in the Santa Clarita Valley as well as increased chloride levels during periods of drought. Thus, there is extensive evidence that the chloride levels in the effluent of the treatment plant will be substantially increased by approval of this Plan. 25

While the Plan itself describes this problem, the DEIR fails to accurately disclose the extent of the impact from new building. Thus, the Plan will exacerbate the problem while failing to provide a goal or policy to address it. Further, there is no proposed funding mechanism to pay for the needed improvement upgrades to lower the chloride levels or to pay for the fines that will be imposed if the Sanitation Districts violate the Clean Water Act by not complying with the established Chloride TMDL. 26

Recommendations for Plan Goals and Policies regarding Water Quality

- The Plan must include a timeline and funding mechanism to provide compliance with the Clean Water Act TMDL for Chlorides and other pollutants such as bacteria described in the Plan. 27
- Mitigation measures that require chloride elimination for all future sanitation district connections must be required. 28
- Funding for upgrades to the Sanitation plants to eliminate chloride from the effluent released to the Santa Clara River must be included in new connection fees. 29

Traffic

Under this Plan, traffic will more than double from existing levels to buildout, even with proposed transit oriented density (see page Table 3.2-6 p. 3.2-26). 30

The County and City must create a long term funding mechanism to be paid by developers for these cumulative impacts as described in the EIR (see EIR p.3.2-49, policy C 2.6.1) prior to approval of this Plan. Such a mechanism would at least provide some assured mitigation for the expected increases, although it would still not be adequate. Without such a funding mechanism, the mitigation will not be forthcoming as required due to lack of funding, thus the mitigation is really not feasible. 31

We note that traffic levels will exceed those allowed by the Development Monitoring System DMS) and the current Area Plan. We do not believe that it is appropriate to diminish the level of service to D and state that sometimes E and F will be acceptable. Further, it is inconsistent with the DMS. In affect, the County is planning to allow gridlock. Resolving traffic issues by merely obscuring the existence of the DMS that is meant to protect the public and analyzing the infrastructure need as though gridlock is the new norm is not an acceptable or legal mitigation for diminishing the traffic impacts. 32

The DEIR fails as an informational document

Table 3.2-4, Existing Level of Service Summary – Arterial Roadways, lists the existing ADT volume and corresponding V/C ratio and LOS rating of each study segment.[17] While this report 33

[17] DEIR P.3.2-10

is dated 2010, most of the data is dated between 2005 and 2007, making the information in this report rather out of date given the intensive building in the period prior to 2008. Key roadway segments where extensive building has occurred such as the Old Rd. (segments 239-244) were already at Level D and certainly must have deteriorated even further by this time. Therefore an accurate baseline has not been determined for such key areas. 33

The Plan goes on to say that eleven of the arterial roadway segments at Level F are located within the City's Planning Area. "Therefore, no segments within the County's Planning Area operate at LOS F." First, we don't know that to be the case since current data for many of the intersections most likely to reach those levels has not been provided. Second, if this is truly a joint plan, it should not matter whether the LOS F's are in the City or the County, they must be addressed by this Plan. 34

Information provided in the following table (3.2-5) is not dated. Again, out of date information will indicate a lower traffic level, so the dates that the intersections were surveyed should be provided. 35

On reviewing the Austin-Foust report of existing conditions as compared to OVOV Planned build out, existing conditions are based on year 2004, not 2010 when the Plan was released.[18] Up to date information should have been readily available from the City and County planning departments. Since many changes have occurred since 2004, this makes the comparison inaccurate. 36

It is also impossible to determine which approved but unbuilt projects have been included in the report. Are these units already included in the 2004 calculations or not? This will make a huge difference in the Plan comparisons, yet the information is not available. 37

The data is based on zoning for particular areas, but does not indicate whether it was the low range, mid-range or high range of allowable housing. This could make a substantial difference in the calculation of trip ends. This ambiguity could substantially skew the conclusions presented in the DEIR. Therefore the DEIR must provide a more detailed description of how this information is derived. 38

The DEIR states the trip generation will be increased 121% with the OVOV plan over existing levels, which is obviously a significant impact. In an effort to avoid this discussion the document advises:

> "Therefore, the more appropriate approach involves comparing the number of trips that would be generated under buildout of the current County Area Plan and City General Plan to the number of trips that would be generated under buildout of the proposed County Area Plan and City General Plan".[19] 39

When this comparison is made, future buildout of the OVOV plan results in a 3% increase in trip ends over the future buildout of the existing plan. However, according to the consultant, future vehicle miles traveled will supposedly be less due to the implementation of mitigation. So, in

[18] Austin Foust Report, 2010, Appendix 3.2
[19] DEIR pg. 3.2-26

spite of the continued low levels of service indicated by the charts provided in the document, the DEIR now finds **"**impacts would be less than significant." (Pg.3.2-57) 39

It is obvious that the DEIR has reached this conclusion by first using the wrong baseline. It is well known that in *Save our Peninsula v. Monterey County Board of Supervisors* (2001), 87 Cal.App.4th 99, 125, the Court of Appeal stated:

> "Section 15125, subdivision (a), now provides: "An EIR must include a description of the physical environmental conditions in the vicinity of the project , as they exist *at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced. …This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant."* (Italics added.) Furthermore, the section 15126.2 now provides as follows: "In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced" These amendments reflect and clarify a central concept of CEQA, widely accepted by the courts, that the significance of a project's impacts cannot be measured unless the EIR first establishes the actual physical conditions on the property. (*County of Amador v. El Dorado County Water District, supra,* 76 Cal.App.4th at p. 953, 91 Cal.Rptr.2d 66; *Environmental Planning & Information Council v. County of Carmel-by –the-Sea v. Board of Supervisors, supra*, 183 CalApp.3d 229, 227 Cal.Rptr. 899.) In other words, baseline determination is the first rather than the last step in the environmental review process." 40

Instead, the DEIR continues to examine the future traffic impacts of the old plan to the future impacts of the OVOV and concludes that they will be less in spite of an increase in trip ends from 3,207,093 to 3,288,386 [20] because of the implementation of policy measures to promote non-auto oriented transportation, beginning on page 3.2-55. 41

And secondly, the DEIR concludes that these impacts are less than significant because the policies listed in the DEIR will provide mitigation that reduces vehicle miles traveled. However, very few of the policies are actually mandated. Wording employed in the policies such as "consider, evaluate, promote, and where feasible" renders them legally unenforceable. 42

In fact, the County and City have removed bike lanes to re-stripe roadways to three lanes for additional development. The bus service is difficult to use because of the infrequency of buses, resulting in long wait times. Metrolink ridership could easily have been evaluated for current usage and to analyze whether an increase has occurred over time, thus providing real trip reduction data. But no such evaluation exists in the DEIR. 43

We therefore believe that where the DEIR concludes that the "Implementation of the proposed Area Plan could result in a potentially significant increase in traffic**"** on page 3.2-26**,** while at the same time reaching the conclusion that impacts from a 121% increase in trip generation under the OVOV plan **"** would be less than significant" (p3.2-57) is patently absurd. 44

[20] Austin-Foust, 2010, Table 2-4 Page 2-16, DEIR Appendix 3.2

Consistency
Table 3.2-11 on page 3.2-51 indicates that peak travel levels of service resulting from either Plan will result in deterioration of current levels of service that are not acceptable or consistent with the plan goals and policies. This is true also for congestion at several intersections and on many road segments. 45

Such levels of service are also not consistent with the policies of regional plans with which OVOV must comply.

Recommendations for Plan Goals and Policies regarding Traffic 46

- Include an explanation of the Development Monitoring System in the Plan
- Include strong language requiring formation of funding mechanisms for road improvement so that existing residents do not bear the cost burdens of infrastructure expansion. 47
- Maintain the LOS C requirements found in the existing City and County Plans. 48
- Include language that ensures mapped bikeways will not be eliminated by road re-stripping
- Include requirements for feeder transportation to commuter rail and bus stops. 49

Air Quality

Per our comments on the traffic section, it appears that the wrong baseline is used for traffic analysis. This being the case, either the air quality analysis must also be incorrect or the traffic and air quality sections are not consistent with each other.

The DEIR for the County Area Plan used an air quality model called URBEMIS2007. This is a 2007 model and does not include new regulations, such as SB375 and the new Title 24 Building Energy Efficiency Standards. If these rules will be included in project level analysis, they should be included in the modeling. However, air pollution reductions claimed as a result of efficiencies gained through these rules cannot be allowed unless binding legal language to ensure their use is included in the Plan and at the project level. 50

The DEIR identifies an increase in selected emissions with the buildout of the OVOV plan. It than states that some emissions would be reduced through the build out of the plan. Such reasoning is illogical and confusing, and is the result of using the wrong baseline as described in the discussion on traffic analysis.

The Santa Clarita Valley is in a non-attainment area for ozone, PM2.5 and PM10 air pollution. In a rating from marginal to extreme, the SCV was rated severe. Approval of the 2007 Air Quality Management Plan allowed local entities to request a "bump up" to the Extreme classification. This "bump-up" applies to ozone only. The category change allowed an extension of time to comply, but required instituting certain mitigation measures and the attainment of "milestones". We do not see the required mitigation measures in the DEIR. Nor is there a discussion of the milestones that must be reached in order to comply with the 2007 Air Quality Plan. Without compliance, Federal funding for road expansion will be denied. 51

It is ironic to have a Plan Policy **Goal CO 7**, "clean air to protect human health and support healthy ecosystems", while at the same time the County's member on the Air Board supported the "bump up" to extreme status for ozone, thus condemning our community to suffer the health problems resulting from exposure to high ozone levels for an extended period of time to 2024. 52

The health effects of this pollutant as described on the EPA air quality website are as follows:
Ozone –" (a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e)Vegetation damage; and (f) Property damage."

53

The attainment date for PM2.5 is much earlier then the 2024 extended date for the ozone extreme designation. The PM2.5 plan, due in 2008, is still being processed with the US EPA.

54

Adverse health effects for particulate pollution as described by the EPA website are as follows:
PM10 "(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly".
PM2.5 Same as above.

55

The 39,000 approved but not built units in the Los Angeles County area plan will be the main source of this problem. Those units include Newhall Ranch which is the largest urban sprawl area in the state, a leap-frog project that the County approved in violation of its existing anti-leap-frogging plan policy. This Specific Plan also violates the new plan **Policy LU 1.1.3: "**Discourage urban sprawl into rural areas by limiting noncontiguous, "leap-frog" development outside of areas designated for urban use" cited as the means by which air pollution will be reduced. **How can the new Plan make such a claim when the Supervisors ignored the Plan in past approvals and so many specific plans and tracts are already approved but not built that will not meet these goals?**

56

Based on the thresholds of significance identified in Appendix G of the 2005 *CEQA Guidelines*, a project would have a significant effect on the environment if it would:
(a) conflict with or obstruct implementation of the applicable air quality plan;
(b) violate any air quality standard or contribute substantially to an existing or projected air quality violation;
(c) result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
(DEIR page 3-3-34)

57

Therefore, the DEIR correctly concludes: "Potential air quality impacts from implementation of the proposed General Plan and Area Plan would remain potentially significant after the implementation of mitigation measures".

58

However, the result of this finding of significance is that the Planning Commission and Supervisors routinely approve projects full well knowing that they will not meet air quality standards. Their response is essentially that they cannot do anything about it and the particular project before them will not make any difference.

59

Recommendations

- This Plan ***may not*** be approved without legally binding language requiring all feasible mitigation to reduce air quality impacts. These mitigation requirements must be spelled out specifically and binding language such as "shall use" must be employed to avoid evasive legal maneuvers in the future. Although, "Black box" future unidentified mitigation is allowed under the "bump up" to the extreme ozone pollution category in the Air Plan, it is not be allowed under CEQA. 60
- Mitigation measures must be identified and enforceable. 61
- All milestone requirements of the Ozone Reduction Air Plan must be clearly stated. If the milestones are not met, the mitigation measures must be revised accordingly and the General Plan should be re-evaluated. 62
- The Air Plans for PM 10 and PM 2.5 are over due. This Plan should not be approved until those Plans are completed and appropriate mitigation is incorporated to reduce particulate matter pollution. 63

No air quality trading credits should be allowed for the Santa Clarita Valley. Such a trade with Long Beach was already allowed to enable the siting of a polluting power plant in Placerita Canyon. Trades such as this only serves to condemn our community to air pollution and health problems while ensuring that another community receives clean air. A prohibition against the use of air quality credits must be a required mitigation measure. 64

Our valley is experiencing substantially increased asthma rates, particularly in children. It is no longer a healthy place for families due to the poor air quality. A Plan that substantially increases housing approvals while failing to address air pollution is condemning the current and future population to expensive and debilitating health problems. 65

Global Warming and Climate Change

In January 2007, the Los Angeles County Board of Supervisors adopted the Countywide Energy and Environmental Policy with guidelines for sustainability and green building design within County departments. (EIR 3.4 County of Los Angeles Area Plan, page 32). The Policy also incorporated a sustainable building program into County capital improvement projects and seeks to integrate energy efficient and sustainable designs into future County building plans. Since these are obviously a feasible mitigation measure, these same requirements must be included as mitigation for all commercial and residential projects. 66

The City of Santa Clarita General Plan proposes to increase the amount of residential units and then abate this density by the reduction of units and sprawl in rural areas surrounding the City, i.e., in the County area, in order to meet the objectives of SB 375, the anti –sprawl bill. However, County approved specific plans such as Newhall Ranch and North Lake would already seem to preclude compliance with SB375 when the Valley is considered as a whole. 67

While the concepts behind SB375 may eventually provide some relief from traffic and air pollution in more urbanized areas, or in areas without housing approvals that already reach far into the future, it seems an unlikely solution for existing suburbs such as Santa Clarita with its 39,000 units of existing approvals. Further, without stronger, enforceable goals and policies in 68

the County Plan and expiration of existing tract maps, the concept of lower County densities and higher City densities is not feasible and will only result in higher densities in both areas. 68

In fact, the DEIR unfortunately admits that this is the case. Under the "Significance of Impact Mitigation Framework" the County Plan states that "Based on the above quantitative analysis, the OVOV proposed Area Plan and General Plan could potentially impede or conflict with the State's goal of meeting AB32 given the increase in GHG emissions".[21] 69

It seems that the only way to reduce Green House Gas emissions and clean up our air so people can live in a healthy and safe environment in the Santa Clarita Valley is to reduce the density in both the City of Santa Clarita General Plan and the Los Angeles County Area Plan. 70

Recommendations

Require development of a Climate Action Plan ***before or concurrently*** with this General Plan Update so that its findings and mitigation can be required in the General Plan Goals and Policies and as mitigation in the EIR. 71

Biology

Wildlife corridors

Although we continue to assert that the Plan and the EIR require additional mitigation in many areas, including a revision of the population projections, and additional goals and policies, we urge the County, after such revisions, to adopt revised version of alternative 2 as the least environmentally damaging alternative. This alternative would support the wildlife corridors identified in the South Coast Wildlands Missing Linkages report and proposed SEAs (Significant Ecological Areas) by a density reduction. 72 73

Further, we urge the County especially to revise any areas proposed for development within the riparian buffer zone of a creek, stream or river and to develop firm policies to protect these areas. Development within such buffer zones should not be permitted. Preservation of natural watercourses is vital both to wildlife, wildlife movement and the ground water supply of the Santa Clarita Valley. 74

Oaks and Global Warming

Additionally, we believe that the County must analyze and disclose the effects to global warming on the lose of oaks and oak woodlands in the Santa Clarita Valley. CEQA now specifically requires Oak Woodlands to be treated as a significant resource. We have requested cumulative analysis of the extensive destruction of oaks in the SCV for many years. Permitted projects have allowed the destruction of thousands of oaks over the last 20 years. Though some oaks were replaced after the approval of the 1988 County Oak Ordinance, many were not replaced or those replacements have since died. 75 76

We believe the extensive lose of these native trees has and will have a large and measurable effect on the absorption of global warming gases. The effect of this loss on GWG is also required to be analyzed. There is no analysis for the lose of oaks or the greenhouse gases that will be generated by this loss. 77

[21] DEIR 3.4-139

Land use changes in this plan will promote additional oak removals. Continued destruction of the trees will add to the increase of global warming. While re-planting may at least provide some mitigation, current requirements do not appear to be sufficient. This effect should be analyzed and disclosed in the Plan and the EIR. 77

Recommendations

- Permitted oak removals should be discouraged. The County should work with developers to design projects around the oaks instead of allowing removals. 78
- When removals are permitted, fees should be increased to ensure monitoring of mitigation oaks and replacement of oaks that have died during the mitigation period. 79
- Mitigation oaks should be monitored for a minimum of five years and replaced within that time if they don't survive. 80

Affordable Housing

While areas adequate to meet affordable housing goals have been set aside in Santa Clarita, the development community has not chosen to build housing sufficient to meet the housing needs of very low, low and moderate income earners. Information provided in the City of Santa Clarita's Plan under the affordable housing section states that instead, high income housing exceeds planned requirements by 179% and the requirements for low income housing are meet mostly by providing senior housing developments and are sadly lacking for other social groups. 81

Since teachers and other professionals on whom our community depends to provide the very fabric of our society, require the availability of moderate to low income housing in order to live in the Santa Clarita Valley close to their jobs, this discrepancy must be addressed. We believe that it should be addressed in both City and County areas by requiring inclusionary housing in all planning approvals. Inclusionary housing should be promoted and required as mitigation in the County update.

Conclusion

Since the County and the City Plans will be approved separately, to the extent that one Plan depends on actions or mitigation required in the other Plan, the Plans are not enforceable. For example, should the County agree to a Plan Amendment to increase density in its area, a circumstance that has occurred innumerable times in the past, there is no requirement, (nor any way of enforcing such a requirement, if it did exist), that the City Plan concurrently reduce its density. 82

Further, existing approved Specific Plans including North Lake and Newhall Ranch preclude any possibility of reducing sprawl in County areas. Many of these plans have not yet received tract map approvals or are having financial problems, so the County could address this issue by requiring that approvals expire after a certain amount of time. Currently tract maps are routinely granted long extensions. 83

The County is not acting in good faith to reduce density in outlying areas as witnessed by the recent approval of the auto-oriented 1260 unit Skyline Ranch on the far eastern border of the Santa Clarita Valley. This project will not be served by any public transportation and will add to traffic and air pollution problems in the Santa Clarita Valley. How will any mitigation measures in the County Plan prevent such land use approvals in the future? 84

The Plan is unenforceable without the use of stronger legal language in the goals and policies. The goals and policies should be re-written using language at least as strong as the language in the current Plan. 85

We will be providing additional comments as the public process continues. Thank you for the opportunity to participate. 86

Sincerely,

Lynne Plambeck
President

Attachments:

1. USGS Circular 1156, Sustainability of Groundwater Resources, section on "Effects of Ground water Development on Ground water Flow – Streams", 1999
2. Castaic LakeWater Agency DPH Policy Memo 97-005 Compliance Report, Black and Vetch Engineering, Dec. 2009

Letter No. E3

3435 Wilshire Boulevard
Suite 320
Los Angeles, CA 90010-1904

SIERRA CLUB
FOUNDED 1892

(213) 387-6528 phone
(213) 387-5383 fax
www.sierraclub.org

February 21, 2011

Mitch Glaser
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, California 90021

TITLE
One Valley One Vision

COMMENTS

As both residents of the Santa Clarita Valley and members of the Sierra Club, we are extremely concerned about the ramifications of the "Area Plan Update (One Valley One Vision)." The proposed increases to population density have long-term consequences that seem absolutely shocking when one considers the economic, environmental, and societal pressures of the times. The proposed OVOV plan allows for increases in development that will substantially degrade the quality of the environment in northern Los Angeles County. The proposed plan has some good information about green building, environmental sustainability, etc. but is flawed because it lacks the follow-through, the strong language, required to put these great ideas into action. 1

- Opposition to Elimination of the Development Monitoring System

The County OVOV Plan proposes a 420,000 increase in projected population for the Santa Clarita Valley. This will substantially impact many infrastructure needs, including those required to be addressed by the Development Monitoring System. What is that, you ask? It would seem some of the County staff were asking the same question. 2

The County version of the OVOV proposes to eliminate the Development Monitoring System DMS). We oppose this proposal. Further, we assert that such a proposal is not legal since it would make the General Plan update for the Santa Clarita Valley inconsistent with the LA County General Plan.

The DMS is a General Plan Amendment (SP 86-173) that was authorized by the Board of Supervisors on April 21st, 1987 in all Urban Expansion Areas such as the Santa Clarita Valley. It was developed with the overview of James Kushner, acting as Court referee. Since it was the result of a Court settlement for this public interest litigation brought by

the Center for Law and the Public Interest, the County cannot ignore it; pretend it doesn't exist, or make it go away.

This litigation was brought on behalf of the public under a situation exactly similar to the one we have today, i.e., the County was proposing a huge population increase without sufficient infrastructure to support it. The population projection will then enable extensive additional housing approvals because the "Plan" will project inadequate housing for this enormous increase, making the developers very happy. However, one must consider: what about schools, roads, sewers and libraries to support this enormous increase in population? What about the quality of life of existing residents?

That's what the DMS is supposed to address. In an article written by Mr. Kushner for "Zoning and Planning Law Report" in May of 1988, he stated:

> "The Los Angeles County Development Monitoring System (DMS) utilizes computer technology to determine capital facility supply capacity and demand placed upon that system by each approved and proposed development. The computer warns decision-makers when demand exceeds capacity and instructs planners on system capacity expansion to meet projected demand."

If there aren't enough school classrooms to serve the new development, the project must be downsized, delayed or denied until there are. This also goes for sewer capacity, library facilities, water, roads and fire service.

2

Additional legal challenges to ensure the implementation of the DMS followed, but after successful litigation by the Hart District on behalf of schools in the early 90s and by the Sierra Club and other groups on behalf of schools and libraries in 1993, the County has begun to implement the DMS for at least these two areas.

The Sierra Club was also a party to the 2000 Court Decision on the Newhall Ranch Project. Eventually, the Project was set aside in part because it "failed to comply with the DMS section of the General Plan as it relates to water supply."[1] The Return of the Writ and the Findings of the County on its approval of the Newhall Specific Plan state that a DMS analysis will be conducted for each tract map in this project.

It is too convenient that Impact Sciences is the EIR Consultant for both the County on OVOV and on the Newhall Ranch Project for Newhall Land and Development (Re-organized Newhall Land). We believe that the proposal for the elimination of the DMS represents a significant conflict of interest for this company, since they are representing both the developer and the County.

Further, the OVOV Plan apparently will not meet critical portions of the DMS requirements, particularly in the area of traffic (a congestion level E is not acceptable) and water supply. (See OVOV Comment Letter dated Oct. 28, 2009

[1] Page 32, Statement of Decision of Judge Roger Randall, Kern Case 238324-RDR

regarding sufficiency of water supplies for Plan build-out submitted by Castaic Lake Water Agency).

We believe that the DMS must remain in the OVOV Plan both because it is required by law for consistency with the General Plan and as required mitigation for the substantial population increase proposed by OVOV. 2

- Infrastructure

Since the year 2007, California has not needed tens of thousands of new homes (especially in newer towns such as Santa Clarita). If anything, people should be moving into homes in more urban areas where there are more jobs, public transportation, etc. Foreclosures, bankruptcies, and losses of adequately paying jobs have resulted in a surplus of unoccupied homes; including new homes. Many new homes and small businesses in the Santa Clarita Valley remain uncompleted and/or empty because of the recession, a sick economy, state and federal deficits, and a long-term lack of demand for more new homes. California has the worse debt and economy of any state in the country. Citizens have lost much income and savings over the last year and the project may soon be asking them to spend and buy in an isolated, remote area. 3

Due to the troubling economic times, many schools in the Santa Clarita Valley have seen a huge drop in enrollment and thus have lost state A.D.A. monies in addition to the extremely detrimental budget cuts coming from both the state and federal government. This has meant that local school districts have had to halt the building of new schools, increase class-sizes, and have either pink-slipped and or let-go of qualified teachers. A proposed increase in density and a lack of the DMS does not make our current situation any better.

- Biology

The Santa Clarita Valley has been working on increasing major wildlife linkage corridors and creating open space. With the added density recommended in the OVOV the animals that exist on or utilize the current open space along the edges of our valley would lose their habitat and foraging grounds. Native habitat will be destroyed and many of the few pockets of open space will be just that, "islands" within the city. How will these pockets be of any use to the animal species that frequent these wildlife corridors? This makes no sense. Animals that transition through the area (looking for food and water, etc.) will have nowhere to go. Communities are scattered around so as to create obstructions to any wildlife corridors. Why is this? 4

Also, the OVOV could be much stronger in reference to encroachment on the floodplain of the last major wild river in Southern California. The upper stretch of the Santa Clara River is part of one of five areas in the world with a Mediterranean-type habitat. It includes more imperiled species than any other region in the continental United States and as such is biodiversity hotspot. Irrevocably transforming the habitat of many endangered species into row after row of urban sprawl is not the answer. 5

The OVOV proposed plan says that it will address developments within the city and try to prevent sprawl developments and destruction of the river but also includes the proposed Vista Canyon development. This seems very inconsistent. Vista Canyon is the exact opposite of what we should be allowing as new developments within the city's boundaries. 6 7

Also, Whittaker-Bermite is mentioned in OVOV. This development should have no building on the land due to its location directly atop the San Gabriel fault, not to mention the on-going clean-up on the property. This land should really be set aside as parkland. 8

Another concern that we have discovered is the lack of the identification of Blue-line streams. This is unacceptable. These streams are the tributaries to the Santa Clara River and should be protected as such. 9

On a side note, fossil resources should be housed at Los Angeles County Museum of history w/ donation for supporting the storage of materials 10

There are many places in OVOV that state that the goal/action to be followed is to promote/encourage environmentally responsible actions. This language needs to be stronger. Saying the city will "promote the use of environmentally-responsible building design…and provide examples of these standards" sounds great but truthfully is not enforceable. The document states that individuals should "consider the principles of environmental sustainability." What does that mean? The document should state that all new developments will be required to have green-building, xeriscape, solar paneling, etc. 11

- Traffic

On page 3.2 – 17 it is claimed that the recently completed Cross Valley connector has already substantially reduced traffic volumes on portions of Soledad Canyon Road and other major arterials in the city. A glance at the EIR for the River Park project shows that all intersections impacted by the project's Cross Valley connector will be worse off after build-out than before. The present traffic levels do not reflect build-out conditions. 12

On page 3.2-33 table 3.2 – 6 shows that there will be an increase of 121% in trip ends between the existing situation and OVOV build out. There is nothing in the EIR which remotely mitigates this statistic. A comparison of the current general plan with OVOV shows a 3% gain in trip ends for OVOV over current at build-out. OVOV does nothing for us. 13

There are long lists of goals and objectives to be achieved by following certain policies that are described. For instance, transit oriented development and other trip reduction measures such as carpooling, flexible work, bicycle lanes, etc. are supposed to mitigate the documented LOS >= E problems. We already have these policies but there is no 14

evidence of any impact on traffic. There is nothing in the EIR which demonstrates any improvement to be gained by any of the proposed mitigations. 14

I 5, I 14 and other arterials will not get better by widening or expanding other roads in the SCV. This is because the network of roads is constrained by geography to flow through points of restriction. This is as good as it gets. Furthermore, there is apparently no accounting for the doubling of truck traffic on the I5 (mostly diesel) by 2020, further jamming traffic and further reducing the already bad air quality in the SCV. 15

Finally the assumptions made to get the SCVCTM when using the standard traffic model are most likely a rosy scenario based on pie in the sky estimates of local vs nonlocal jobs and the types of jobs that are expected. This means that all the LOS values are best case. With so many bad LOS segments and intersections already the only solution to mitigate future traffic is development density reduction for all projects. 16

- Air Quality

Previous urban sprawl and development that relies on individual car transportation has contributed to Santa Clarita having poor air quality, and the current plan continues this pattern. Air pollutants directly related to traffic include ozone, carbon monoxide, nitrogen oxides, sulfur dioxide, and coarse and fine particulate matter. Our abundant sunlight hastens the photochemical reactions of these pollutants, causing increased asthma and bronchitis. Nitrogen dioxide depresses the immune system. These consequences are most notable in the very young, whose developing bodies are most vulnerable. It is obvious that the cumulative air pollutant emissions in the area would contribute to the degradation of local and regional air quality. The SCV already exceeds Federal air pollution standards for particulate matter generated from dust and diesel pollution. (information from the AQMD) 17

According to AQMD guidelines no residences should be built with 150' feet from the roadway, as this is where vehicle-caused pollution is most concentrated. No residences should be built directly adjacent to major transportation corridors for truck and vehicle traffic. Also, where development begins (150 feet from a roadway) there should be berms and landscaping to reduce pollution. 18

In addition, long term effects result from the additional traffic on our local roads and freeways. Climatologists agree that greenhouse gases are causing global warming and even the Supreme Court, in its decision several months ago, said that EPA must address Carbon Dioxide as a pollutant. These two facts alone suggest that further discussion of global warming should appear in this document. 19

The already approved construction, and future construction will have their own related pollution. However, construction emissions have a finite lifetime – operational emissions will just keep increasing with significant unavoidable impacts. A doubling of truck traffic on I-5 by 2020 will make things even worse. Previous studies have provided 20

exhaustive analyses of the many impacts of emissions on air quality. Growth must be significantly reduced from the current recommendations in the county OVOV plan. 20

- Global Warming

The Sierra Club agrees with the Attorney General's letter regarding the lack of information in the OVOV EIR on the impacts of global warming. The OVOV plan inadequately addresses the topic of global warming. 21

- Water Supply

In an October letter to Los Angeles County regarding the OVOV General Plan update, the Castaic Lake Water Agency asked that their review of water supply be delayed until the Department of Water Resources releases its currently due "State Water Reliability Report," and a review of that report can be made. We concur with this request and ask that the County delay our review of this issue as well. This report will take into consideration the most recent biological opinions that affect State Water deliveries to Southern California, as well as the potential for reduced snow packs in the Sierras that will further limit the state water supply. Since new development must depend on this state water supply, it is imperative that the County have the most recent and best information regarding those supplies. 22

We would like to re-iterate statements entered into the record regarding the Newhall Ranch project Specific Plan that is a part of this General Plan Update. Valencia Water Co. has no adjudicated rights to ground water or water extraction from the Santa Clara River. If other currently fully entitled projects require that water, then the ground water on which Newhall Land has based its supply will have to be delivered to those other projects. The County should also note, as stated in the CLWA letter, that Newhall Land and Farming has no "wheeling" rights for its Kern County Nickel Water Transfer. 23

Further, last year CLWA was forced to buy the withdrawal priorities from Newhall Land and Farming to provide an adequate water supply for current residents in the SCV during 2009. It is important that the County be aware of the severe shortfall that could have occurred, had CLWA not been able to obtain this withdrawal priority. A planner should calculate the additional water cutbacks that would have occurred, had we not had a real estate slow down and all currently entitled housing had been built. This is a requirement of the County Development Monitoring System. It is unfair to the public and to the business community to demand such potentially severe cutbacks due to the County's failure to understand and plan for the severity of the water supply problem. 24

The County should also note that the perchlorate clean up project is still not on line and functioning as of the date of this letter, although CLWA said it would be functioning in November 2009. Further, the production from this facility is estimated now to be only 25

50% of the previous production of these wells[2]. Since the Saugus Aquifer is supposed to be the drought back up source for water in the Santa Clarita Valley, the failure of this clean up project to begin operation as it was projected five years ago, and now to produce only 50% of its former water supply, is a substantial problem. The Sierra Club has requested in all CEQA comments for the last several years that the County delay further approvals until this facility is actually functioning. [3] We make that request again. 25

- Green Building

Additional points that we feel should be addressed fall under the topic of green building standards. We feel that the OVOV document is lacking in terms of some significant changes that could be made to the way our city operates on a daily basis. For example, we feel that recycling should be available to residents of all developments (condos, townhouses, apartments, etc. 26

Also, solar panels, native landscaping in all developments, xeriscape, low-impact development practices, and LEED building design practices should be included in all new developments. These shouldn't be optional items. They need to happen everywhere new development occurs.

Sincerely,

Katherine Squires

Conservation Chair, Santa Clarita Group

[2] See attached chart of projected water supply production from remediated Saugus Wells
[3] See attached Sierra Club, Angeles Chapter Resolution

Letter No. E4

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

GAIL FARBER, Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

February 9, 2011

IN REPLY PLEASE
REFER TO FILE: LD-1

TO: Paul McCarthy
Impact Analysis Section
Department of Regional Planning

Attention Mitch Glaser

FROM: Steve Burger
Land Development Division
Department of Public Works

RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT
ONE VALLEY ONE VISION (OVOV)
PROJECT NO. R2007-01226
ENV200900080, ZC200900009

As requested, we reviewed the Recirculated Draft Environmental Impact Report for Project No. R2007-01226, OVOV. The County is preparing a comprehensive update to its Area Plan and an associated Environmental Impact Report for the proposed Planning Area. Development within the County and City shall be consistent with OVOV's Vision and Guiding Principles, which are intended to sustain and enhance environmental resources, economic vitality, and the social well being of its residents. 1

The following comments are for your consideration and relate to the environmental document only:

Services-Traffic/Access

Appendix 3.2, Chapter 3.0, Section 3.1:

1. **Subsection 3.1.1** (page 3-1), **Major Arterial Highway** (Lines 3 and 4). 2

   "Unsignalized minor street and driveway access may be allowed but signalized access is preferred and left-turn restrictions **should** be placed at unsignalized access locations."

Replace the word "should" with "may" since we have many unsignalized access points (with stop controls with no left-turn restrictions except for sight distance concern) in this area. 2

2. **Subsection 3.1.2** (page 3-1), **Secondary Arterial Highway** (Lines 3 and 4)

"Left-turn restriction will generally be placed at minor unsignalized driveways (e.g., median breaks will typically only be provided at intersections)." 3

This statement is inconsistent with the fact that secondary highways utilizes two-way, left-turn lanes as a means of allowing full access for commercial driveways and many unsignalized minor cross streets along the roadway do not have or need left-turn restriction unless there are sight distance and traffic conflict concerns.

3. **Subsection 3.1.3** (page 3-2), **Limited Secondary Highway** (Line 1)

"This classification applies to two-lane roadways generally without medians or bike lanes." 4

This is also inconsistent with our practice. We have used painted medians as a means of left-turn lane transitions. Also bike lanes can be installed along this type of roadway sometimes for the purpose of bikeways gap closure.

4. **Subsection 3.1.5** (page 3-2), **Collector Streets** (Line 3)

"Typically no median is provided and on street parking is allowed..." 5

Collector streets sometimes do require medians for intermittent access and also as means for left-turn lane transitions. There is no mention of bike lanes here. This type of roadway does accommodate bike lanes for bikeways gap closure.

5. **Section 3.2 Roadway Dimensions** (page 3-3, Line 2 to Line 4)

While the maximum value represents a desirable standard, variations in-right-of-way width....." 6

Please add "and the need for auxiliary lanes for right-turn and left-turn purposes" to the sentence.

6. **Table 3-1**(page 3-4)

   6.1 Typical configuration for a Major highway calls for a 14-feet raised median or 12-foot painted median. The painted median should be 14 feet not 12 feet. Also, not all the side streets need to be signalized. It should be based on warrants. 7

   6.2 Same corrections for Secondary highway typical configuration except for the allowable use of 12-feet raised median. 8

   6.3 In the typical configuration for a Limited Secondary, please correct the reference to "no bike lane" based on earlier comments above for this classification. 9

   6.4 In general, please modify your typical roadway cross-sections on pages 3-6 though 3-9 accordingly and also to reflect the fact that the County prefers the use of 12 foot travelled lanes next to the curb (parkway or median) in addition to the width of the PCC gutter (shoulder) consistent with Caltrans design guidelines. 10

If you have any questions regarding the traffic/access comment Nos. 1 thru 6.4, please contact Sam Richards (626) 458-4921 or srich@dpw.lacounty.gov. 11

Chapter 3.2 Transportation and Circulation

7. Page 3.2-30, Impact Analysis—The Environmental Impact Report (EIR) states a Level of Service (LOS) F is considered unacceptable on arterial roads within the OVOV Planning Area. However, the EIR identifies five roadway segments that will have a LOS F after buildout of the proposed OVOV land uses. Therefore, an acknowledgement should be added that the five segments have unacceptable, but unavoidable, levels of congestion and any related environmental finding may need to consider a Statement of Overriding Considerations. 12

8. Page 3.2-48, Policy C 2.6.2—We recommend completing the feasibility study to establish a City/County Intelligent Transportation Management System impact fee prior to including it as an area plan policy. The County is unaware of any current study which has determined that this type of improvement adequately mitigates a project's impact to roadways and intersections. 13

9. Page 3.2-64, Policy C 5.4.1—We recommend establishing a milestone date of completion for the feasibility study of a City/County transit impact fee (see Policy C 5.4.2). The feasibility study should describe the methods for assessing a project's impact on transit systems including the establishment of significance thresholds. 14

10. Page 3.2-66, Policy 6.1.2—We recommend deleting this policy in its entirety. Class 2 bike lanes cannot be readily implemented within the right of way of numerous roadways without resulting in a significant impact to vehicular traffic and buses. 15

Below are additional policies we recommend for inclusion in the OVOV Plan.

11. We recommend the design of circulation plans for proposed schools take into account any conflicts during drop-off/pick-up hours with morning and afternoon peak-hour traffic congestion in the surrounding area. This includes a careful review of a school's location to ensure that bicycle and pedestrian access are encouraged, and if vehicles are anticipated to be used for drop-off/pick-up that the queuing created does not conflict with overall circulation. 16

12. We recommend the design plans for traffic signal modifications or new installations include the upgrade of poles for future left-turn phasing when warranted and the installation of a time base unit for future coordination. 17

13. We recommend the design plans for all future signal installations include the provision of communications system linking the signal to either the City's or County's traffic control system. 18

14. We recommend the promotion of the County's Neighborhood Traffic Management Program that addresses cut-through traffic through neighborhood streets. The information is available on Public Works' website at http://dpw.lacounty.goviTNUNTMP/Page_01.cfm. 19

If you have any questions regarding traffic comment Nos. 7 thru 11, please contact at Jacques M. Gilbert at (626) 300-4721 or jgilbert@dpw.lacounty.gov. 20

Services–Sewage Disposal

Public Works' Consolidated Sewer Maintenance District is responsible for the maintenance of the local sewers within the City of Santa Clarita and unincorporated Santa Clarita area. Therefore, the proposed sewer system within the project area will be required to comply with Public Works' sewer design and construction standards. We will also require the entire development, upon completion, be annexed to the Consolidated Sewer Maintenance District. 21

If you have any questions regarding sewage disposal comment, please contact James Hilovsky at (626) 300-3363 or ihilovskv@dpw.lacounty.gov. 22

Hazards-Flood/Water Quality

The last paragraph on page 3.12-4, states that Los Angeles County Flood Control District provide routine street sweeping service in unincorporated area. This statement is incorrect and should state that street sweeping is provided by Public Works' Road Maintenance Division. 23

If you have any questions regarding flood/water quality comment, please contact Chien-Hao Chen at (818) 896-0594 or chichen@dpw.lacounty.gov. 24

If you have any other questions or require additional information, please contact Toan Duong at (626) 458-4945 or tduong@dpw.lacounty.gov.

JY:ca
P:\ldpub\CEQA\CDM-TD\DRP - Project R2007-01226_One Valley One Vision_RDEIR.docx

Letter No. E5

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294

(323) 890-4330

FEB - 9 2011

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

February 1, 2011

Mitch Glaser. Staff Member
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Mr. Glaser:

DRAFT ENVIRONMENTAL IMPACT REPORT, NOTICE OF COMPLETION, AVAILABILITY, AND RECRICUALTION OF DRAFT ENVIRONMENTAL IMPACT REPORT, PROJECT NO. R2007-01226-(5), PLAN AMENDMENT CASE NO. 200900006-(5), ZONE CHANGE CASE NO. 200900009-(5), ENVIRONMENTAL ASSESSMENT CASE NO. 200900080-(5), STATE CLEARINGHOUSE NO. 2008071119, ONE VALLEY ONE VISION (OVOV) SANTA CLARITA (FFER #201000232)

The Draft Environmental Impact Report has been reviewed by the Planning Division, Land Development Unit, Forestry Division, and Health Hazardous Materials Division of the County of Los Angeles Fire Department. The following are their comments:

PLANNING DIVISION: 1

1. We have reviewed the Recirculated Draft Program Environmental Impact Report for the Santa Clarita Valley Area Plan Update, One Valley One Vision. Our comments are highlighted in bold as follows:

EXECUTIVE SUMMARY

TABLE ES – 1: Summary of Project Impacts and Recommended Mitigation Measures

3.15 PUBLIC SERVICES 2

2. Paragraph 5, sentence 3: The **2009** median response time for the OVOV Planning Area was 5 minutes 42 seconds.

SERVING THE UNINCORPORATED AREAS OF LOS ANGELES COUNTY AND THE CITIES OF:

AGOURA HILLS	BRADBURY	CUDAHY	HAWTHORNE	LA MIRADA	MALIBU	POMONA	SIGNAL HILL
ARTESIA	CALABASAS	DIAMOND BAR	HIDDEN HILLS	LA PUENTE	MAYWOOD	RANCHO PALOS VERDES	SOUTH EL MONTE
AZUSA	CARSON	DUARTE	HUNTINGTON PARK	LAKEWOOD	NORWALK	ROLLING HILLS	SOUTH GATE
BALDWIN PARK	CERRITOS	EL MONTE	INDUSTRY	LANCASTER	PALMDALE	ROLLING HILLS ESTATES	TEMPLE CITY
BELL	CLAREMONT	GARDENA	INGLEWOOD	LAWNDALE	PALOS VERDES ESTATES	ROSEMEAD	WALNUT
BELL GARDENS	COMMERCE	GLENDORA	IRWINDALE	LOMITA	PARAMOUNT	SAN DIMAS	WEST HOLLYWOOD
BELLFLOWER	COVINA	HAWAIIAN GARDENS	LA CANADA-FLINTRIDGE	LYNWOOD	PICO RIVERA	SANTA CLARITA	WESTLAKE VILLAGE
			LA HABRA				WHITTIER

3.15 PUBLIC SERVICES

Fire Protection

3. Paragraph 2, sentence 1: The **2009** median response time for the OVOV Planning Area was 5 minutes 42 seconds.

3

EMERGENCY SERVICES AND WILDLAND FIRE PROTECTION

Summary

4

4. Sentence 4: The **2009** median response time for the OVOV Planning Area was 5 minutes and 42 seconds.

Existing Conditions - Provider and Facilities

Volume of Calls

5. In **2009**, the **LACoFD** stations in the OVOV Planning Area responded to **15,739** calls within the Planning Area, of which **471** were fire and **10,989** were emergency medical services, **Table 3.15-8, Fire Incidents**. The Fire Department also responded to nine hazardous materials calls, including reports of hazardous conditions. The **2009** median response times throughout the OVOV Planning Area were five minutes and 42 seconds. Department goals for **1st-arriving units are**:

   - Urban 5.0 minutes or less
   - Suburban 8.0 minutes or less
   - Rural 12.0 minutes or less

   However, actual response times vary due to distances and road conditions.

5

Table 3.15.-8
Fire Incidents

Incident Type	County's Planning Area	OVOV Planning Area
Fire	193	471
EMS	3,026	10,989
Other	1,489	4,279
Total	4,708	15,739

Fire Service Funding

6. The LACoFD Fire District provides fire protection and emergency medical services to the City. The majority of funding for fire services is obtained through property taxes. Additionally, voters in the Fire District approved a special tax in 1997 to pay for essential fire suppression and emergency medical services. The special tax is billed on the Joint Consolidated Annual Tax Bill under Detail of Taxes Due, Direct Assessments. The most common rates are single family residence-~~$49.93~~ **$56.17**; multiple-family residences-~~$63.07~~ **$70.95** + ~~$.0064~~ **$.0072** per square foot **over 1,555 square feet**; and commercial/industrial - ~~$60.43 + $0.0407~~ **$67.98 + $.0458** per square foot **over 1,555 square feet.** 6

Impact Analysis

7. Paragraph 3, sentence 5: **In 2009,** the median response time throughout the County's planning area was **6** minutes **30** seconds (**Policies S 3.3.1 to S 3.3.3**). 7

8. Paragraph 7: The last sentence should be amended to read: Additionally, fire stations would also be funded by the County of Los Angeles Developer Fee Program for the benefit of the LACoFD in effect in the Santa Clarita Valley. 8

LAND DEVELOPMENT UNIT:

1. The Land Development does not have specific access and water systems requirements at this time. Access and water system requirements will be addressed with the submittal of plans. If there are any changes to circulation, the water system or street design, including the installation of traffic calming measures, plans will need to be submitted to the Land Development Unit for review. Please call (323) 890-4243 to contact the Land Development Unit. 9

FORESTRY DIVISION – OTHER ENVIRONMENTAL CONCERNS:

1. The statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources, and the County Oak Tree Ordinance. 10

2. The areas germane to the statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division have been addressed.

HEALTH HAZARDOUS MATERIALS DIVISION:

1. The Health Hazardous Materials Division has no objection to the proposed project. 11

If you have any additional questions, please contact this office at (323) 890-4330.

12

Very truly yours,

JOHN R. TODD, CHIEF, FORESTRY DIVISION
PREVENTION SERVICES BUREAU

JRT:lj

Letter No. E6

Glaser, Mitch

From:	Jennifer Kilpatrick [jekilpatrick@hotmail.com]
Sent:	Tuesday, February 22, 2011 4:43 PM
To:	Glaser, Mitch; jsmisko@santa-clarita.com
Subject:	Submission of Final Remedial Action Plan on Whittaker Bermite OU2-OU6 Dated 11/30/10 for Administrative Record on One Valley, One Vision General Plan Updates
Attachments:	BermiteDTSCApprovesOU2OU6RAPDec2010.pdf; Whittaker_Site-Wide RAP_Sections 1-8_ 113010.pdf; Whittaker_Draft RAP OU2-OU6_DTSC Approval ltr_71510.pdf

TO: Los Angeles County Regional Planning & City of Santa Clarita Planning Departments
Attention: Mitch Glaser & Jason Smisko

RE: Comments on One Valley, One Vision General Plan Updates for County's Santa Clarita Valley Area and City of
Santa Clarita Valley

DATE: 2/22/11

FROM: Jennifer Kilpatrick for Santa Clarita Organization for Planning the Environment (SCOPE)

I am attaching, as a formal comment on the OVOV General Plans now pending before the County and City, a copy of the California Department of Toxic Substances Control's "Final Remedial Action Plan (RAP) for Operating Units 2 through 6 at Whittaker Bermite. My emails with the DTSC Project Manager, Jose Diaz, below, authenticate the documents. 1

The reason that SCOPE is submitting these DTSC documents, as well as the others to which Mr. Diaz refers on DTSC's website, is to remind both the County and the City that the Whittaker Bermite property's Operating Units 2, 3, 4, 5 and 6 are very far from being remediated to toxic substances to such an extent that three "paper" major roads in the City of Santa Clarita will be built in the near future. Those "paper" major roads are: 2

(1) Via Princessa on the Whittaker Bermite property;
(2) Santa Clarita Parkway on the Whittaker Bermite property and across the Santa Clara River; and
(3) An extension of Magic Mountain Parkway from its current intersection with Railroad Avenue up into the Bermite property.

As I am sure you know, the owner of the Whittaker Bermite property is supposed to pay for design and construction of those roads and their necessary bridges, as part of the conditions to development of the so-called Porta Bella Specific Plan. 3

We are hereby advising you that because the DTSC approved remediation of the soil on the Whittaker Bermite property has not yet been remediated, the remediation is far from being completed and the roadbeds for those three roads are located in OU2 through OU6 on Whittaker Bermite, any use of those three roads, for the purpose of running traffic studies analyzing levels of service for roads in the County or City or for concluding in the text of the Circulation Elements in the OVOV plans that no County or City roads will operate at LOS E or LOS F is pure sophistry, or to put it less politely, a breach of the various California statutes and regulations governing preparation and the content of General Plans. It would be legitimate to include those "paper" roads in traffic studies and LOS calculations were the ground on which they are built fully remediated of toxins and released by DTSC for road building. However, that is not factually the case, nor is it likely to be the case for at least 5 years or more, or more if the routes of the roadbeds traverse (a) soil heavily contaminated with TCE or PCE (carcinogenic volatile organic chemicals) or (b) the multiple landfills (contents factually unknown) located within the Whittaker Bermite property. 4

As a result, SCOPE and all other participants in the planning process reserve the right to administratively and judicially challenge the factual assumptions in the County's and City's traffic models supporting the OVOV General Plans, as well as the traffic Level of Service determinations resulting therefrom which are stated in the Circulation Elements and in other parts of the plan. 5

Under separate cover, I will be forwarding to you Whittaker Corporation's January 2011 status report letter to DTSC which talks about "where they are" in the actual remediation process on each Operating Unit. 6

SCOPE suggests that your departments re-run your traffic models, reports and LOS calculations without those three "paper" roads through Whittaker Bermite and to be paid for by Whittaker Bermite's land owner, which as you know are presently in Chapter 11 bankruptcy in Phoenix in a case called In Re RFI Realty, Inc. USBC Case No. 02-04-bk-10486-CGC. 7

> Date: Tue, 22 Feb 2011 15:41:51 -0800
> From: Jdiaz@dtsc.ca.gov
> To: jekilpatrick@hotmail.com
> Subject: RE: Looking for Final RAP on Whittaker Bermite OU2-OU6 Dated 11/30/10
>
> The Final RAP approved for implementation is dated November 30, 2010 as indicated in the December 6, 2010 DTSC letter and can be found in the Activities Section. The final RAP contains final CEQA documents and the Responsiveness Summary. I attached the front end (Sections 1-8) of the document.
>
> The draft RAP dated July 12th, 2010 was approved for public review comment per the July 15, 2010 DTSC letter (attached)and can also be found in the Activities Section and the Community Involvement section.
>
> I have deleted the draft RAP dated July 12th, 2010 from the Activities Sections to clear up any confusion. Please refer

to the actual dates on the documents and not the dates on Envirostor as sometimes we are unable to meet some deadlines. I apologize for any confusion with the documents. Please contact me any questions.
>
>
> >>> Jennifer Kilpatrick <jekilpatrick@hotmail.com> 2/22/2011 1:12 PM >>>
>
> Thanks for your reply. I have seen what was posted on Envirstor under Activities. However the date of the "Final RAP" on Envirostor is in July 2010, not the November 30, 2010 Final RAP date which the DTSC letter approving the Final RAP recited. (See the attached letter.) Perhaps the DTSC approval letter had the wrong date in it.
>
> If the Final RAP for OU2-OU6 is already on Envirostor, just email me the exact July 2010 date which Whittaker's consultant put on the first page of what you consider to be the Final RAP. That way there will be a paper trail linking the Final RAP and the approval letter.
>
> Again, note that the reason that we are seeking a well documented paper trail to what is the Final RAP for OU2-OU6 is not for any DTSC related colloquy, but instead because it is going to be submitted to the City Council in connection with their consideration of rewording of Santa Clarita's General Plan update to reflect what's left to be done at Bermite, which foreshadows how quickly 3 major "paper" roads can be built through Bermite (Santa Clarita Pkwy, Magic Mountain Pkwy and Via Princessa).
>
> Thanks for your help.

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi
Acting Director
9211 Oakdale Avenue
Chatsworth, CA 91311

Arnold Schwarzenegger
Governor

July 15, 2010

Dr. Hassan Amini
AMEC Geomatrix Consultants, Inc.
510 Superior Avenue, Suite 200
Newport Beach, CA 92663

Draft Remedial Action Plan for Operable Units (OU) 2 through 6 - Former Whittaker-Bermite Facility, Santa Clarita, California

Dear Dr. Amini,

The Department of Toxic Substances Control (DTSC) has reviewed the July 12, 2010 revision of the Draft Remedial Action Plan (RAP) for OU2 through OU6. DTSC hereby approves the draft RAP for public review and comment. The public comment period will start July 19, 2010 and will end on August 19, 2010. A public meeting will be held on July 29, 2010 at 1830 hours in the Council Chambers of the Santa Clarita City Hall. Following the completion of the public comment period, DTSC will evaluate all comments received on the draft RAP and determine whether any revisions are necessary. Please contact me at (818) 717-6561 with any questions.

Sincerely,

Jose F. Diaz, R.E.H.S.
Senior Project Manager
Brownfields &Environmental Restoration Program
Southern California – Chatsworth Office

Printed on Recycled Paper

cc:
The Honorable Laurene Weste
City of Santa Clarita
Council Member
22216 Placerita Canyon Road
Newhall, California 91321

The Honorable Bob Keller
City of Santa Clarita
Council Member
23920 Valencia Boulevard, Suite 300
Santa Clarita, California 91355

Ms. Connie Worden-Roberts
Chairperson of the Community Advisory Group
25709 Rye Canyon Road
Santa Clarita, California 91355

Mr. Eric G. Lardiere
Vice President, General Counsel
Whittaker Corporation
1955 North Surveyor Avenue
Simi Valley, California 93063

Ms. Lisa Webber
Planning and Building Services
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, California 91355-2196

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi
Acting Director
9211 Oakdale Avenue
Chatsworth, CA 91311

Arnold Schwarzenegger
Governor

December 6, 2010

Dr. Hassan Amini
AMEC Geomatrix Consultants, Inc.
510 Superior Avenue, Suite 200
Newport Beach, CA 92663

APPROVAL OF REMEDIAL ACTION PLAN FOR OPERABLE UNITS 2 THROUGH 6 - FORMER WHITTAKER-BERMITE FACILITY, SANTA CLARITA, CALIFORNIA

Dear Dr. Amini,

The Department of Toxic Substances Control (DTSC) approves the final Remedial Action Plan (RAP) for Operable Unit (OU) 2 through 6 prepared by CDM dated November 30, 2010 for implementation. DTSC prepared a Responsiveness Summary and filed Mitigated Negative Declaration and Notice of Determination in compliance California Environmental Quality Act

The RAP presents the remedial goals and objectives and the strategy for achieving remedial goals. The overall objective is to cleanup those areas of the Site where past manufacturing and testing operations have caused chemical contamination to soils that pose an unacceptable risk to human health and the environment. The selected remedial action includes a combination of approaches and technologies to address the varied contamination at the Site that includes in-situ soil vapor extraction (SVE), excavation, off-site disposal for soils not amenable to ex-situ treatment, ex-situ SVE treatment of excavated soils, ex-situ biological treatment and in-situ biological treatment.

The draft RAP, dated July 12, 2010, was made available for public comment from July 19, 2010 to August 19, 2010 and a public hearing was held on July 29, 2010. DTSC reviewed and evaluated the comments received and requested revisions to the RAP accordingly. A copy of the Responsiveness was previously provided and is included in Appendix E of the RAP. No changes were made to the proposed methods to address the contamination in soil and soil gas in OU2 through OU6 and the deeper soils in OU1.

Please submit the Remedial Design by February 18, 2011. Please contact Mr. Jose Diaz at (818) 717-6614 or me at (818) 717-6612 with any questions.

Sincerely,

Javier Hinojosa
Unit Chief
Brownfields &Environmental Restoration Program
Southern California – Chatsworth Office

Cc:
The Honorable Laurene Weste
City of Santa Clarita
Council Member
22216 Placerita Canyon Road
Newhall, California 91321

The Honorable Bob Keller
City of Santa Clarita
Council Member
23920 Valencia Boulevard, Suite 300
Santa Clarita, California 91355

Ms. Connie Worden-Roberts
Chairperson of the Community Advisory Group
25709 Rye Canyon Road
Santa Clarita, California 91355

Mr. Eric G. Lardiere
Vice President, General Counsel
Whittaker Corporation
1955 North Surveyor Avenue
Simi Valley, California 93063

Ms. Lisa Webber
Planning and Building Services
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, California 91355-2196

Remedial Action Plan
Operable Units 2 through 6

Former Whittaker-Bermite Facility
Santa Clarita, California

November 30, 2010

Prepared for:

Whittaker Corporation

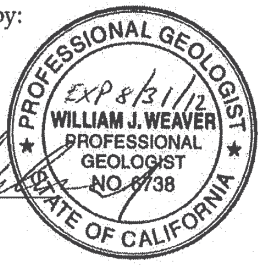
Prepared by:

CDM
111 Academy, Suite 150
Irvine, California 92617

Project No. 20415-62863-T2.REPORT

This document titled, *Remedial Action Plan, Operable Units 2 through 6, Former Whittaker-Bermite Facility, Santa Clarita, California,* dated November 30, 2010, and has received appropriate technical review and approval. This document was prepared under the supervision of a California Professional Geologist.

Reviewed and Approved by:



William J. Weaver, P.G.
Principal

Steven L. Brewer
Sr. Vice President

Contents

Appendices

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Section 1
Introduction

1.1 Purpose

This Remedial Action Plan (RAP) has been prepared pursuant to the Imminent and Substantial Endangerment Determination and Order and Remedial Action Order (the Order) issued to Whittaker Corporation (Whittaker) by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) on November 22, 2002 (DTSC, 2002) for the former Bermite facility (the Site) in Santa Clarita, California (Figure 1-1). For effective management of site characterization and remediation, the Site has been divided into seven operable units (OUs) with OU1 through OU6 designated for soils and OU7 for groundwater beneath the Site (Figure 1-2). Characterization of all OUs has been completed and perchlorate remediation of the shallow soils in OU1 was completed in 2009 as proposed in the approved remedial action plan by excavation and ex-situ bioremediation. A draft remedial action completion report (RACR) was submitted to the DTSC in March, 2010. The RACR documented the shallow soil excavations and ex situ bioremediation operations and also summarized the status of the ongoing soil vapor extraction (SVE) systems for soils impacted by volatile organic compounds (VOCs). DTSC, in a letter dated June 8, 2010, stated that "excavation and ex situ bioremediation of perchlorate impacted soils in OU1 has been successfully completed and DTSC concurs that no additional excavation and ex- situ soil treatment is necessary". DTSC further indicated that SVE remedial activities should continue until the remedial action objectives stated in the OU1 RAP are met. The SVE operations for OU1 were recently completed and confirmation soil-gas sampling is planned to document that the objectives of the OU1 RAP have been met.

The area addressed in this RAP encompasses OUs 2 through 6. It also considers the deep soils for OU1 not previously addressed in the OU1 RAP and Remedial Design (RD) documents. The preparation of this RAP follows the completion of a series of remedial investigations, health risk analyses, literature reviews, treatability studies, field pilot tests of ex-situ soil treatment, feasibility studies, and interim cleanup and other measures protective of human health and the environment that Whittaker has conducted starting in 1995 and continuing to date under work plans submitted to and approved by DTSC.

The actions proposed in this RAP are an integral part of a comprehensive remedial strategy and multi-track remediation approach that addresses all media (i.e. soil, soil gas, surface water, perched water, and groundwater) at the Site and the immediate surrounding area, that have been impacted from historic manufacturing and testing operations. It has been prepared in concert with and complements the other remediation activities that are underway to control and/or contain and remove the effects of the chemicals detected in those media and for the ultimate goal of protection of human health and the environment. To that end, this RAP has been prepared specifically to address the soils within the OU2 through OU6 and the deeper

soils within OU1 as referenced above and, therefore, it needs to be reviewed with the understanding that the ultimate goal of protection of human health and environment will be achieved through the collective implementation of this RAP and other remedies that are being planned and will be implemented.

This RAP presents the methods that are proposed to remediate OU2-OU6 soils (and the deeper soils in OU1) that contain perchlorate, halogenated volatile organic compounds (HVOCs), and metals at levels exceeding risk-based cleanup goals, and the rationale used in developing the remedial strategies. The remedial methods are proposed within the general context of a comprehensive strategy to address all impacted media and prepare the Site for future beneficial use. The overall approach for the remediation of the soil at the Site will include integration with the groundwater remedies and future Site redevelopment. This approach is risk-based, and will allow sufficient flexibility to adjust to and coordinate the remedial efforts with any Site redevelopment or reuse plans that may arise. In its current condition, approximately 85 percent of the area at the Site is free of any shallow chemical impacts and is suitable for unrestricted land use from an environmental standpoint. Provided appropriate remedial measures are taken to mitigate the impacts and risks, the majority of the remainder of the Site can be rendered suitable for unrestricted land use with some areas likely suitable for other forms of land use.

The feasibility study (FS) for selection of appropriate groundwater (OU7) remedies was recently submitted to DTSC for review (ENVIRON, 2010). The OU7 FS addresses all three occurrences of groundwater (i.e. Northern Alluvium, Saugus, and Perched Water) at the Site. Meanwhile, an interim remedial program for containment and remediation of perchlorate and VOC impacted groundwater is currently being conducted for the Northern Alluvium aquifer. In addition, a plan for a pilot program for containment and remediation of perchlorate and VOC impacted groundwater within the Saugus formation along the western Site boundary (ENVIRON, 2008) has been reviewed and approved by DTSC and is being implemented. The data obtained from this pilot program will be utilized to design a full-scale groundwater containment system for the Saugus formation along the western Site boundary. Further, the pumping and wellhead treatment implemented at the Saugus 1 and 2 production wells will provide containment and remediation of impacted groundwater within the capture zone of these wells. Therefore, once all measures implemented, the results of the comprehensive remedial approach will be protective of human health and the environment, taking into consideration the various impacted media (soil, soil-gas, surface water, perched water, and groundwater), and the exposure pathways associated with these media. The key elements of the comprehensive remedial approach will include the following:

- Implementation of proven risk-based soil and groundwater remedial measures. Certain technologies (i.e., soil vapor extraction [SVE]) and groundwater containment/pump and treat), have been initiated under pilot scale programs in order to obtain key critical data needed to develop full-scale remedial systems;

- Implementation of removal actions to quickly address contaminants that may pose an immediate threat to human health or the environment;
- Evaluation of the potential success and applicability of a selected number of innovative in-situ technologies to address impacted groundwater, perched water, and deep soils under the Site conditions;
- Integration of remedial measures between the various impacted media; and
- Retaining flexibility for integration of remedial efforts with future Site redevelopment plans.

These elements of the remedial approach are discussed further in Section 1.3.1.

1.2 Remedial Objectives

The overall objective of the remedial program is to clean up those areas of the Site where past manufacturing and testing operations have caused chemical impact to soils at levels that pose an unacceptable risk to human health or the environment. This program will be implemented within the general context of anticipated future Site redevelopment. Although the default remedial goal for this RAP is to allow unrestricted land use, the RAP also provides the capacity to apply institutional and/or engineering control measures and land use restrictions in cases where unrestricted land use risk levels cannot be met after the implementation of the remedy.

The specific objectives of this RAP are:

- Application of risk-based remedial goals for protection of human health and the environment; and
- Selection of remedial measures that were found appropriate based on the approved Feasibility Study (FS) for source areas at the Site in order to meet the risk-based remedial goals.

The objectives of this RAP are intended to be in line with the comprehensive strategy to address soil and groundwater remediation, and will meet the following goals:

1. Protection of human health.
2. Protection of ecological receptors.
3. Protection of surface water quality.
4. Protection of groundwater quality.

The remedial goals consider different risk tolerance levels that are appropriate for alternative land uses (e.g., commercial/industrial, multifamily residential, open

space) under various redevelopment scenarios; but, as stated above, the default remedial goals for this RAP are based upon unrestricted land use.

The achievement of remedial goals will be confirmed through sampling and analysis to demonstrate that residual concentrations of chemicals do not pose an unacceptable risk to human health or the environment If the remedial goals cannot be achieved through implementation of the remedies proposed in this RAP, then deed restrictions, institutional controls, and/or engineering controls will be considered to manage the residual risks to human health.

The objectives for this RAP were developed within the context of a global and comprehensive approach to soil and groundwater remediation at the Site, which is discussed further in the following sections.

1.3 Overall Approach for Achieving Remedial Goals

The remedial goals and objectives stated in Section 1.2 above will be addressed through a comprehensive site remediation approach and through application of conventional remedial methods, as well as a number of innovative technologies, if found to be appropriate. This approach is discussed in the following sections.

1.3.1 Site Remediation Approach

As previously described, the Site was divided into six soil OUs and one groundwater OU. Although the dividing the Site into seven OUs has proven to be an appropriate approach that has resulted in effective characterization of chemical impact to affected media at the Site, any evaluation of remedial measures must be conducted within context of an overall global and comprehensive Site remediation approach. For the former Whittaker-Bermite facility, the global site remediation approach will be protective of human health and the environment, taking into consideration the various impacted media (soil, soil-gas, surface water, perched water, and groundwater), and the exposure pathways associated with these media. Conceptual site models depicting various media and the chemical transport pathways are presented in Section 4.3. The remedial approach includes the following key components.

- **Implementation of proven risk-based soil and groundwater remedial measures that have been evaluated and selected through the FS and based on their ability to effectively address:**
  - Protection of human health from exposure to chemicals in surface and near surface soils.
  - Protection of ecological receptors from exposure to chemicals in surface and near-surface soils.
  - Protection of surface water quality.

- Protection of groundwater quality.

- Protection of downgradient receptors (public supply wells).

- **Implementation of remedial measures to address risk-based cleanup goals according to anticipated end land use scenarios -** The default remedial goals for this RAP will be based on unrestricted land use levels, but flexibility will be maintained to coordinate the remediation program with future redevelopment and apply the alternative risk-based goals specific to differing planned land uses in the event that new Site development plans are in place at the time of cleanup. For the purpose of this RAP, the risk-based threshold concentrations (RBTCs) for unrestricted land use will be applied for all areas of the Site. However, RBTCs may not be technically and practically achievable in all cases. Based on the physical constraints at certain areas, and magnitude and extent of chemical impacts in specific areas of the Site, unrestricted land use for these areas, which are discussed further in Section 7, may not be technically and/or practically feasible; however, these areas would likely be suitable for commercial land use, recreational land use, or open space. The determination of technical and/or practical feasibility will be evaluated and discussed between Whittaker and DTSC, but the final determination will be made by DTSC. Following is a summary of the chemical impact, affected media, exposure pathways, and remedial measures that can be implemented for protection of human health and the environment:

  - For soil impacted by non-volatile compounds (e.g., perchlorate, metals, etc.), the exposure pathways are generally limited to the upper ten feet of soil as construction and/or household activities in most residential or commercial settings (e.g. gardening, landscaping, swimming pool installations) do not typically exceed this depth. However, in order to ensure that future users of the Site are not exposed to elevated concentrations of COPCs exceeding the RBTCs, the depth of the proposed remedies will extend to at least 10 feet below the proposed final surface elevations presented in the approved Porta Bella Plan. Therefore, in areas where the proposed final grades are at lower elevations than the existing land surface (i.e. future cut areas), the remedial efforts may extend to greater depths than 10 feet in order to meet the remedial objectives.

  - For soil impacted by VOCs, the exposure pathway for human health concerns extends beyond the upper ten feet due to the vapor intrusion pathway, which is considered for the upper 100 feet in accordance with EPA guidance. In areas where the proposed final grades are at lower elevations than the existing land surface (i.e. future cut areas), the evaluation of the vapor intrusion risks will extend to appropriate depths beyond 100 feet. Pending the outcome of those evaluations, the remedial efforts may also need to extend beyond 100 feet in order to meet the remedial objectives. For areas exceeding the RBTCs for the anticipated land use, it is presumed that SVE will be the likely remedy. If residual VOC concentrations persist and exceed the applicable RBTCs after

SVE operations, then institutional and/or engineered controls, as approved by DTSC, may be applied under non-residential use scenarios to mitigate the residual risks.

- The protection of groundwater resources will be addressed in one of two ways, as applicable. For soils exceeding the soil screening levels (SSLs) for protection of groundwater in Northern Alluvium or SSLs for protection of surface water, the soils would be addressed directly through selected soil remedial measures. For soils exceeding the SSLs for protection of Saugus aquifer, where the majority of the impacted soils extend to depths beyond the reach of conventional remedial measures, the groundwater will be protected through the installation and operation of a western boundary groundwater containment system (discussed in further detail below). Additionally, an innovative in situ technology (i.e.. gaseous electron donor injection technology [GEDIT]) will be evaluated first on a bench-scale level, and if successful, followed by a field pilot scale study to assess applicability and potential effectiveness (both technical and cost) of addressing these deeper impacted soils. It must be noted that groundwater will be protected by the western boundary containment system even if GEDIT is not proved to be a viable option.

- Potential remedial measures to address impacted perched water zones, which also represent ongoing sources of chemical impact to deeper aquifers, are being evaluated through bench-scale studies and in situ field pilot studies. The perched water issues will be specifically addressed as part of the OU7 RAP. Additionally, as stated above, the Saugus groundwater will be protected by the western boundary containment system even if effective remedial measures are not identified to address the perched water zones directly.

- **Implementation of removal actions to address contaminants that may pose an immediate threat to human health or the environment -** This strategy has already been implemented within OU2 and OU5 soils to remove a sump containing titanium tetrachloride ampoules, red phosphorous impacted soils, underground storage tanks, flare casings, and seepage pits that could act as conduits for contaminant transport. This strategy is also currently being implemented through the construction and operation of an interim groundwater containment system along the northern Site boundary in Northern Alluvium.

- **Implementation of "industry proven" in-situ technologies for soil and groundwater cleanup (i.e., SVE and groundwater containment/pump and treat) -** Work plans have been submitted to and approved by DTSC for pilot studies for SVE for selected areas at the Site impacted by VOCs and groundwater containment along the western property boundary within the Saugus aquifer. The SVE pilot work and Saugus containment work are currently underway. There are several benefits associated with the implementation of the pilot studies, which include: 1) provide critical data from which to determine feasibility of various

remedial technologies and/or necessary data to design full-scale remedial actions; 2) acceleration of the overall remediation schedule, particularly for those areas where remedial excavations may be delayed until the in-situ remedial measures have been completed; and 3) the pilot studies will likely result in appreciable mass removal of chemicals from subsurface soils and groundwater which is consistent with the overall remedial objectives.

- **Integration of remedial measures between the various impacted media. The evaluation and selection of remedial measures for a particular media must take into account the effect of planned actions for other media -** This comprehensive strategy is an important factor in developing efficient, appropriate, and cost effective remedies. Additionally, in some cases multiple media may be addressed through a single remedial measure. For example, plans are currently underway to pilot dual-phase extraction (DPE) in a portion of OU5 to address the chemical impact to both unsaturated and saturated zones.

This RAP has been prepared in consideration of the aforementioned comprehensive remedial strategy that includes measures necessary to address both shallow and deeper impacted soils as well as appropriate groundwater remedies for the Site. Although this RAP does not present the specific groundwater remedial alternatives, it has been prepared within the context of conducting adequate on-site groundwater containment activities to prevent/limit off-site movement of chemicals from the Site, while reducing on-site groundwater chemical mass. The groundwater containment efforts consist of the following elements:

- Northern alluvium containment system (OU5) – There is an operating system that currently extracts and treats approximately 60 gallons per minute (gpm) of groundwater, and is permitted for up to 100 gpm.

- On-site Saugus formation containment (OU7) – A Work Plan for Saugus Aquifer Pilot Remediation was submitted to DTSC in September 2008 to install the initial wells, conduct pumping tests, and modeling to obtain aquifer parameters and criteria for the design of a full-scale system (ENVIRON, 2008). DTSC provided comments and approved the work plan on December 31, 2008. Implementation of the work plan is underway and it is expected that the full-scale system will contain the chemically impacted zones of Saugus Aquifer within the Site boundary through extraction and treatment of approximately 300 to 500 gpm groundwater.

- Off-site Saugus formation containment at Saugus 1 and Saugus 2 Production Wells – This system, which is currently under construction, and is expected to be on line in 2010, will contain and remediate impacted groundwater within its capture zone, while protecting other water supply wells downgradient of the Saugus 1 and 2 production wells.

This context is significant, and a comprehensive approach for shallow and deeper soil, and groundwater containment and treatment, is necessary because there is a significant uncertainty regarding the practicability of a remedial alternative for deep perchlorate impacted soils. However, regardless of the degree of success of on-site source removal measures for deep soils, mitigation and protection of groundwater resources will be achieved. The OU7 FS addresses perched on-site groundwater, groundwater in Northern Alluvium, and deeper Saugus groundwater.

1.3.2 Consideration of Innovative Technologies

As directed by DTSC, the approved Site-Wide FS (CDM, 2007) included innovative in-situ technologies as a remedial alternative for the treatment of deep perchlorate-impacted soils, pending successful field pilot testing of such technologies. It is important to note that these technologies have not been tested or proven to be appropriate for treatment of deep soil and groundwater under the Site conditions; thus several assumptions regarding their application were required. Because of the uncertainty of these unproven technologies, on-site pilot testing work plans have been submitted to and approved by DTSC. At the conclusion of those pilot studies, the application of those innovative technologies as remedial measures will need to be further evaluated for potential implementation under various Site conditions.

1.4 Incorporation of Future Redevelopment Plans

The City of Santa Clarita has approved a large scale, mixed use development plan for the property known as the "Porta Bella Plan." These entitlements are now held by the current owner of the property, Remediation Financial Inc. / Santa Clarita LLC (SCLLC), which purchased the property from Whittaker in 1999. SCLLC agreed to clean up the contamination at the Site pursuant to an enforceable agreement with the DTSC, but since filed bankruptcy; consequently, DTSC issued the Order to Whittaker to study and cleanup the Site. Under the bankruptcy court's oversight, the property is currently being marketed for development as a multi-use community.

Since the drafting of the Porta Bella Plan in 1995, a significant amount of environmental investigative work has been conducted across the Site. Based upon the findings of those investigations, DTSC has acknowledged that some of the Site areas designated for unrestricted land use under the Porta Bella Plan, are unlikely to be suitable for unrestricted use even after application of a remedy; therefore, the approach outlined in this document allows for flexibility to incorporate some modifications to the proposed land uses as described in the Porta Bella Plan, as well as the flexibility to apply appropriate institutional and/or engineering controls for the specific areas of the Site where remediation to unrestricted land use conditions may not be technically and/or practically feasible. These areas are discussed further in Section 7. It should also be noted that cleanup objectives will be determined with respect to the final grade as set forth in the Porta Bella Plan or other approved plan, and not the current grade.

The incorporation of the Porta Bella Plan grading envelope into this RAP, which would likely be similar to other alternative redevelopment plans, ensures that the remedial efforts will render the Site safe for human health and the environment under both the current Site conditions and future anticipated uses and grades.

1.5 Organizational Content

The following summarizes the organizational content of the RAP:

- **Section 2.0, Site Location and History.** This section provides relevant background information on the Site.
- **Section 3.0, Physical Setting.** This section discusses climate, topography, geology, soil types, soil characteristics, hydrogeology, hydrology, background levels of COPCs, and surrounding land use.
- **Section 4.0, Summary of Remedial Investigations.** This section describes and summarizes the results of the remedial investigations (RI) that were conducted to identify and quantify the nature and extent of COPCs in potentially impacted soils.
- **Section 5.0, Summary of Site Risks.** This section describes and summarizes the results of baseline human health and ecological risk assessments that were conducted on the basis of the RI findings and presents the remedial goals for the Site.
- **Section 6.0, Summary and Evaluation of Alternatives.** This section summarizes the remedial alternatives evaluation and selection from the feasibility study (FS).
- **Section 7.0, Proposed Remedy**. This section discusses how the proposed remedy will be implemented at the Site, the rationale for the selected remedy, and a discussion of staging and timeframe for remedial actions.
- **Section 8.0, References.** This section lists the references cited in this document.
- **Section 9.0, Figures.**
- **Section 10.0, Tables.**

Section 2
Site Location, Description, and Background

2.1 Location and Description

The Bermite facility is located at 22116 West Soledad Canyon Road in Santa Clarita, California. The Site encompasses 996 acres and is situated in Township 4 North, Range 16 West, Sections 23, 24, 25, and 26 within the U.S. Geological Survey (USGS) 7.5-minute, Newhall, California topographic quadrangle (Newhall topographic map and Figure 1-1, Site Location Map). The Bermite facility is currently inactive with approximately 30 buildings formerly used for administration and/or storage remaining. Former process, manufacturing, and test facilities have been removed. Several security/maintenance personnel currently work at the Bermite facility. The Los Angeles Aqueduct transects the eastern portion of the property through an underground conveyance system. Producing oil fields are located approximately 0.5 mile southeast and 1.2 miles northwest of the Bermite facility. A commuter rail station has been built on an approximately ten acre parcel located in the northern area of the property along Soledad Canyon Road. The property is in the process of being marketed for development of a master-planned community including residential, commercial, retail, and may include light industrial components.

2.2 Ownership History

The area was originally subdivided by Newhall Land & Farming Company and Los Angeles Home Company in 1912 and is comprised of three parcels. Parcel 1 is the northern portion of the Site that is currently occupied by the commuter rail station. Parcel 2 is the southern, roughly square-shaped area of the property. Parcel 3 is the western portion of the Bermite facility. Previous owners included Los Angeles Powder Company from 1934 to 1936, Halifax Explosives Company from 1936 to 1942, E. P. Halliburton, Inc., in 1942, Bermite Powder Company from 1942 to October 1967, Whittaker Corporation from 1967 to 1999, and Santa Clarita LLC from 1999 to the present. All of these companies, with the exception of Santa Clarita LLC, utilized the facility for production of munitions and explosives, including dynamite, fireworks, oil field explosives, and photoflash devices.

2.3 Early History and Use

During most of the early history, manufacturing was restricted to the northern portion of the property and through time the plant expanded toward the southeast and into the central portion of the property. From 1934 to 1936, the Bermite facility was used to manufacture dynamite under the ownership of L.A. Powder Company. Historical information indicates that the Halifax Explosives Company manufactured fireworks at the Bermite facility from 1936 to 1942. In 1939, Golden State Fireworks made fireworks at the Bermite facility. In 1942, E.P. Halliburton reportedly manufactured oil field explosives. Production by the Bermite Powder Company was carried out from 1942 to 1967. Between 1942 and 1953, Bermite Powder Company produced a more limited line of products that included flares, photoflash devices for

battlefield illumination, and other explosives. The "Bermite" name was applied to a blasting product made from a mixture of the high explosives trinitrotolouene (TNT) and cyclonite (RDX). Neither constituent was synthesized on Site but, rather, was purchased as a raw material. From 1953 to 1967, production consisted primarily of detonators, fuses, boosters, coated magnesium, and stabilized red phosphorus.

2.4 Whittaker History and Use

Between 1967 and 1987, under Whittaker ownership, the Bermite facility manufactured various products in the general categories described below.

The overall operation/production at the Bermite facility was dependent on contract orders. These orders affected the number of employees, number of buildings needed, turnover of building usage, chemicals used, and waste by-products generated. Some of the products listed below were produced in small quantities on an as-needed basis, while others were mass-produced as a result of large defense contracts. Other products remained in research and development stages.

Ammunition Rounds - These are small caliber cannon shells (also called cartridges). Each cartridge is made of a head, a casing, and the propellant. The cartridges, mostly in the 20-millimeter (mm) and 30-mm sizes, were loaded with gun propellant and assembled at the Bermite facility.

Detonators, Fuses, and Booster - These are devices that initiate the main charge of an explosive. They contain small amounts of sensitive high explosive. When detonated by an electric or flame source, they send a shock wave into the main charge, causing it, in turn, to explode.

Flares and Signal Cartridges - These products provide a light, heat, or visual source. Military applications included infrared decoy flares, battlefield-illumination, smoke generators for signal cartridges, and training versions of missile and artillery main charges. Flares and signal cartridges were two of the primary products produced at the Bermite facility during recent history. Product lines in this category included the Mark 4 signal cartridge, and the W-9 and W-17 practice missile main charges ("dummies").

Glow Plugs and Tracer and Pyrophoric Pellets - These are components of tracer bullets or shells, including the 23-mm tracer pellet.

Igniters, Ignition Compositions, and Explosive Bolts - Igniters and ignition compositions provide a source of high temperature flame to ignite the solid propellant in a rocket motor or a gas generator. Explosive bolts are used to quickly and positively separate individual components, such as is required in rocket staging. A major product line in this category was the igniter for the Mk 47 torpedo gas generator. Other products included the BP-1, Mk 125, and Mk 192 igniters.

Powder Charges - These products are non-military explosives used in oil field development. Products included the Baker #420 and Baker Oil Tool charges.

Rocket Motors and Gas Generator - Rocket motors are propulsion devices that use a burning solid propellant grain to generate thrust. Rocket motors were a major product line at the Bermite facility and included the JATO, Sidewinder, and Chaparral rocket motors. Gas generators are similar, but the combustion gases are used instead for guidance control or to spin turbines for power generation.

Missile Main Charge - The missile main charge is the high explosive component in a missile or artillery shell. The missile main charges for the Sidewinder and Chaparral missile were received prepackaged from an off-site source and assembled at the Bermite facility. The process of installing the initiating device (i.e., the detonator) into the missile main charge was conducted at the Bermite facility.

2.5 Permitting History

Whittaker first applied for a Resource Conservation and Recovery Act (RCRA) Part A permit for hazardous waste management units (HWMUs) in October 1980 and received interim status on September 25, 1981. A modified Part A application was submitted in 1984. A RCRA Part B permit application was submitted on February 21, 1986. Eventually 14 HWMUs were permitted.

Whittaker initially submitted three letters to DTSC in 1983 describing closure activities conducted at the HWMUs prior to approval of a closure plan. A final closure plan was approved by the U.S. Environmental Protection Agency (EPA) and the DTSC for the HWMUs in December 1987. Most of the environmental reports prepared prior to 1994 were associated with the investigation and cleanup activities for the fourteen HWMUs. Thirteen of the fourteen HWMUs have received closure certification acknowledgment from Cal-EPA. The remaining HWMU (also referenced as the OU6) is addressed in this document and is in process of closing.

The Bermite facility had a number of other permits when it was operating, including industrial wastewater discharge permits, hazardous waste control permits, flammable liquid storage permits, air permits, explosive receiving permits, explosive transport (hauler) permits, and flare testing and burn permits. These are highlighted in the following table:

City and County Agencies Associated with Former Bermite Facility

Agency	Oversight Task
City of Santa Clarita – Building and Safety Department – Fire Department – Planning Department	Building, sewer, electrical, and grading permits
Los Angeles County Department of Public Works	Industrial wastewater, landfill, and underground storage tank permits
Los Angeles County Fire Department – Hazardous Materials Section – Petroleum and Chemical Unit (inspection and permitting) – Disclosure Section	General fire prevention: – Hazardous materials – Petroleum and chemical explosives permits – Archived files
Los Angeles County Sanitation District	Sewer hook-up (oversight by City of Santa Clarita)
South Coast Air Quality Management District	Air quality permits
California Department of Public Health, Radiation Management Division	Radioactive material permits

2.6 Regulatory Oversight and Preliminary Identification of Areas of Concern

During October 1993, in response to a request for information from DTSC, Whittaker submitted a report documenting operations and the potential release of hazardous materials for 64 areas at the Bermite facility in addition to the 14 RCRA units. Based on the data contained in the report, DTSC determined that further study was necessary in areas other than the HWMUs previously investigated to assess whether contaminated soil and groundwater posed a threat to public health and/or the environment. In November 1994, DTSC and Whittaker entered into a Consent Order requiring further investigation and possible remedial action. Exhibit 3 of the consent order lists 77 potential solid waste management units (SWMUs).

Santa Clarita LLC (SCLLC) entered a similar enforceable agreement with DTSC after taking over responsibility for Site cleanup in 1999 (Docket No. HAS-A 00/01-174). In November 2002, after it became apparent that SCLLC was not financially capable of complying with the consent order, DTSC issued a unilateral order to Whittaker to resume the Site investigation and remediation work (DTSC, 2002).

DTSC is the lead agency overseeing the soil and groundwater remediation program. The Los Angeles Regional Water Quality Control Board (RWQCB) and California Department of Fish and Game are involved with the oversight of the investigation and remediation of the Site drainages and seasonal streams. The RWQCB is the lead agency with respect to the permitting of any wastewater discharges associated with the cleanup of the Site. The South Coast Air Quality Management District is the lead agency with respect to the permitting of any remedial or investigation processes that result in the generation of regulated air pollutants.

Section 3
Physical Setting

This section describes the regional and local physical characteristics of the Bermite facility. The physical characteristics described below include land use, nearest primary public facilities, demographics, topography, climate, hydrology, geology, soils, hydrogeology, and ecosystem components.

3.1 Land Use

Land adjoining the southwestern boundary of the property has been developed in the last 10 to 15 years as a residential area. The land adjoining the eastern boundary of the Bermite facility is a business park. Soledad Canyon Road is adjacent to the northern portion of the property. Construction of Golden Valley Road along the eastern border of the Site was completed in 2002. The Saugus Speedway is located adjacent to and west of the commuter rail station and is currently used for swap meets. The remainder of the adjoining land is currently undeveloped.

3.2 Nearest Primary Public Facilities

School, child care, hospital, and retirement home facilities within an approximate five mile radius of the Bermite facility were identified by review of the Los Angeles County Assessor's records, map directories, and a reconnaissance of the local area. Identified facility names, owners, and addresses are listed in Appendix B, Table B-1, along with their approximate distances and directions from the Bermite facility (Figure 3-1). The facilities are grouped in the table as follow: those located less than 0.5 mile, those located between 0.5 and one mile, and those located more than one mile from the Bermite facility boundary.

School, child care, hospital, and retirement home facilities (sensitive receptors) within an approximate two mile radius of the Bermite facility were identified by review of Los Angeles County Assessor's records, maps, telephone and business directories, and a reconnaissance of the local area. There are 45 such sensitive receptors located within a two-mile radius of the Bermite facility. Creative Years Nursery School, North Valley Christian School, Notre Dame Infant Center & Preschool, Tutor Time Child Care/Learning Center, and Golden Valley High School are the only sensitive receptors located within approximately 0.5 mile of the Bermite facility.
Henry Mayo Newhall Memorial Hospital is located approximately 1.1 mile from the former Whittaker Bermite facility.

3.3 Demographics

Santa Clarita Valley, which covers approximately 400 square miles, is located in northern Los Angeles County approximately 35 miles northwest of downtown Los Angeles. The city of Santa Clarita includes the communities of Saugus, Canyon County, Newhall, and Valencia, occupying approximately 40 square miles. The remaining 360 square miles of the valley consists of unincorporated areas to the

southwest, the San Gabriel Mountains to the southeast, and the Sierra Pelona Range to the north. According to information obtained from the City of Santa Clarita and the Los Angeles Almanac™, Santa Clarita is the fourth largest city in Los Angeles County with a population of 177, 158, as of January 2007. The average age of the population is 35 years and approximately 38 percent of the population is less than 25 years in age, approximately 54 percent is between 25 and 65 years in age, and the remaining eight percent is older than 65. The median household income is approximately $67,000 and the majority of the Santa Clarita workforce (79 percent) is distributed among the services sector (48 percent), manufacturing (13 percent), finance, insurance, and real estate (nine percent), wholesale/retail trade (nine percent). More than 69 percent of the populace of Santa Clarita Valley is classified as non-Hispanic white, more than 27 percent is classified as Hispanic, with the remaining four percent classified as Asian, Black, or other race.

Santa Clarita Valley presently has a diverse economy, including health care, automobile, entertainment, education, and other services (42 percent); retail and wholesale trade (28 percent); finance, insurance, and real estate (11 percent); construction (eight percent); manufacturing (five percent); transportation and communications (three percent); public administration (one percent); and other (two percent). Major employers with at least 500 employees in the valley include Six Flags California, an amusement park (>3,800 employees); Saugus Unified School District (>2,000 employees); William S. Hart Union School District (>2,000 employees); Princess Cruises (>1,800 employees); U.S. Postal Service (>1,700 employees); College of the Canyons (>1,400 employees); Henry Mayo Newhall Memorial Hospital (>1,300employees); Newhall School District (>800 employees); The Master's College (>700 employees); Specialty Laboratories (>700 employees); H.R. Textron, an aerospace manufacturer (> 600 employees); City of Santa Clarita (>600 employees); California Institute of the Arts (>500 employees); Arvato Services (>500 employees).

3.4 Topography and Hydrology

Site topography consists of steep hillsides with intermittent streams and deep canyons. Ridges trend northeast and southwest, but many ridges and canyons also trend north-northeasterly or south-southwesterly from the main ridge (Knight Piésold, 2003).

The Site was previously divided by AME into 12 hydrologic basins (I through XII), which drain from the Site onto surrounding properties (AME, 1995) (Figure 3-2). The major feature that affects ephemeral surface water run-off is a topographic ridge that extends across the Site from the northwest to southeast, approximately parallel to and west of the San Gabriel Fault. The hydrologic basins at the Site are defined in part by this topographic ridge, which forms a surface water divide. Eight of the hydrologic basins (I through VII, and XII) drain to the west and south of this surface water divide, and the remaining hydrologic basins (VIII through XI) drain to the east and north (ENVIRON, 2004).

OUs 1A, 1B, and 1C are located in the easternmost portion of OU1 and include the upper ridges and drainages of Hydrologic Unit XI. The maximum ground surface elevation along the ridges in OU1A, OU1B, and OU1C is approximately 1,734 feet relative to mean sea level (MSL). The minimum ground surface elevation at the base of the canyon at the northern border of the Site is on the order of 1,416 feet MSL. The drainage basins along the east and northeast boundaries of OU1A, OU1B, and OU1C comprise fingers of a north/south branching arm of Soledad Canyon. Golden Valley Road was completed in 2002 by placing up to 70 feet of compacted fill across the eastern portions of these drainages in a north/south direction for approximately 1,500 feet (GeoSoils, 2000).

OU1Dn is located in the northwestern portion of OU1 and includes the upper ridges and drainages of Hydrologic Unit X. The maximum ground surface elevation along the ridges in OU1Dn is approximately 1,702 feet relative to MSL. The minimum ground surface elevation at the base of the canyon at the northern border of the Site is on the order of 1,342 feet MSL.

OU1Ds is located in the southeastern portion of OU1 and includes the upper ridges and drainages of Hydrologic Unit X (Oro Fino Canyon). The maximum ground surface elevation along the ridges in OU1Ds is approximately 1,635 feet relative to MSL. The minimum ground surface elevation at the base of the canyon at the southern border of the Site is on the order of 1,402 feet MSL.

OU1E is located in the central portion of OU1 and includes the upper ridges and drainages of Hydrologic Units VI and XI. The maximum ground surface elevation along the ridges in OU1E is approximately 1,675 feet relative to MSL. The minimum ground surface elevation in eastern portion of OU1E is on the order of 1,526 feet MSL.

OU2/OU6 is located in the south-central portion of the Site and includes the upper ridges and drainages of Hydrologic Units VI and XII. The maximum ground surface elevation along the ridges in OU2 is approximately 1,745 feet relative to MSL. The minimum ground surface elevation at the base of the canyon at the southern border of the Site is on the order of 1,340 feet MSL. OU6 is the one remaining RCRA unit that is situated within the OU2 area.

OU3 is located in the central portion of the Site and includes the upper ridges and drainages of Hydrologic Units IV and V (Oakdale Canyon). The maximum ground surface elevation along the ridges in OU3 is on the order of 1,740 feet MSL. The minimum ground surface elevation at the base of the canyon at the western border of the Site is on the order of 1,430 feet MSL.

OU4 is located in the north-western portion of the Site and includes the upper ridges and drainages of Hydrologic Units I through IV. The maximum ground surface elevation along the ridges in OU4 is on the order of 1,440 feet MSL. The minimum ground surface elevation at the base of the canyon at the western border of the Site is on the order of 1,270 feet MSL.

OU5 is located in the northern portion of the Site and includes the upper ridges and drainages of Hydrologic Units (VIII through XI). The maximum ground surface elevation along the ridges in OU5 is on the order of 1,660 feet MSL. The minimum ground surface elevation at the base of the canyon at the northern border of the Site is on the order of 1,200 feet MSL.

Figure 1-1 shows the location of the Site, and Figure 1-2 depicts the location of the operable units within the Site.

3.5 Geology

The mapped surficial geology at the Site (Figure 3-3) is reproduced from reports by Pacific Soil (Pacific Soil, 1990 and 1993). The mapped geologic units of the Site include artificial fill (af), landslide deposits (Qls), colluvium (Qcol), and recent alluvium (Qal); alluvium that is indistinguishable from artificial fill (af/Qal); Terrace Deposits (Qt); the Pacoima Formation (also referred to as older Terrace Deposits) (Qp); and the Saugus Formation (Qt). The fill materials alluvium, colluvium, and terrace deposits, where present, are underlain by the Saugus Formation.

The Newhall Section of the San Gabriel Fault (Figure 3-3) passes through the northern and central portions of the Site. The San Gabriel Fault trends approximately north 65 degrees west through the property and has resulted in deformation of the local geologic formations. The majority of the Site is located south of the fault, except for portions of OU1, OU3, and OU5. Bedding north of the fault dips from approximately 20 to 55 degrees to the southwest and increases up to approximately 80 degrees within the fault zone. Flat-lying to gently dipping beds of the Pacoima Formation (also known as older Terrace deposits) are prevalent in OU1Ds south of the fault zone (Pacific Soil, 1990 and 1993). Near the fault, dips of the Pacoima Formation gradually increase from flat-lying to about 20 to 35 degrees southwest.

The following descriptions of surficial geologic units are from Pacific Soil (1990, 1993) and have been updated with information from a recent draft report by GeoSoils, Inc. (GeoSoils, 2000). Information for subsurface geology is taken from various sources, as referenced below.

Artificial Fill (af) - These old fills are mostly associated with past human activities related to grading of old building pads and access roads. Some of the fills may also be associated with construction of the L.A. Aqueduct (GeoSoils, 2000).

af/Qal - Alluvium (Qal) that is indistinguishable from artificial fill (af).

Landslide Deposits (Qls) - Landslide deposits mapped on Figure 3-2 range from slides that involve Saugus Formation bedrock to surface failures or mudflows that typically involve topsoil and slope wash (GeoSoils, 2000).

Alluvium (Qal) - The Santa Clara River system continues to deposit sand and gravel mapped as Quaternary Alluvium of Holocene or Recent Age. Holocene alluvium is characterized by sand, gravel, and boulders of the current channels of the Santa Clara River, generally reducing to sandy and silty floodplain deposits toward the edges of the river valley (Dibblee, 1996). These alluvial deposits are up to approximately 200 feet thick in the Santa Clara River Valley, somewhat thinner in major tributary canyons such as Bouquet Canyon, and up to 75 to 125 feet thick in the floors of other tributary canyons (Slade, 1986).

Colluvium (Qcol) - The term colluvium refers to thicker deposits of topsoil which usually accumulate in swales and near the toes of slopes in response to rain wash, slope creep, and mass wasting (GeoSoils, 2000). Colluvium is present on many slopes in OU1, and merges with the mapped alluvium in drainage bottoms (Figure 3-2). Topsoil on the Site develops through the weathering and decomposition of the underlying bedrock which weathers to a silty, sandy topsoil with gravel and cobbles (GeoSoils, 2000)

Terrace Deposits (Qt) - Following deposition of the underlying Saugus Formation, renewed uplift of the local portion of the Transverse Ranges in the middle Pleistocene resulted in the establishment of the Santa Clara River drainage system in roughly its current configuration (Oakeshott, 1958; Winterer and Durham, 1962). This uplift and dissection of Saugus and older deposits resulted in the deposition of alluvial conglomerate and gravels over a broader area at somewhat gentler gradients than along the current Santa Clara River Valley. In the vicinity of the Site, these alluvial deposits have been variably mapped as "Older Dissected Surficial Sediments" of probable late Pleistocene age (Dibblee, 1996), late Pleistocene Terrace Deposits (Yerkes and Campbell, 1995; Winterer and Durham, 1962), and Pleistocene Pacoima Formation (Pacific Soil, 1993). Terrace deposits in the vicinity of the San Gabriel Fault are not likely to exceed 200 feet in thickness (Dibblee, 1996), but may thicken to as much as 400 feet on the east side of the Site towards the town of Saugus (Dibblee, 1996). The terrace deposits are found on the hill in OU2 at the highest elevation of the Site, approximately 1,730 ft MSL, approximately 500 feet above the current floodplain of the Santa Clara River.

Pacoima Formation (Qp) - Older consolidated terrace deposits of probable Pleistocene age have been mapped south of the San Gabriel Fault zone (GeoSoils, 2000). These deposits were correlated by Pacific Soil (1993) with gravels and boulders of Middle Pleistocene age known as the Pacoima Formation (Oakeshott, 1958). However, more recent mapping (Yerkes and Cambell, 1995) assigns a late Pleistocene age to the Pacoima Formation. The mapped Pacoima Formation/older terrace deposits on the Site consist of predominantly conglomeratic sandstone that is well indurated. The deposits contain abundant one- to two-foot-diameter rounded boulders, which appear to have been derived from crystalline granitic basement rocks of the San Gabriel Mountains exposed several miles east of the Site.

Saugus Formation (TQs) - The Saugus Formation is interpreted as floodplain deposits inter-fingered with alluvial fan deposits (Trieman, 1986). Subsequent faulting and folding in the region has caused the sedimentary rock of the Saugus Formation to form a bowl shaped structure that is bisected by the San Gabriel Fault. The Saugus Formation is of Pleistocene age (Yerkes and Cambell, 1995), extends to a maximum thickness of about 7,000 feet, and is underlain by the Pico Formation (Dibblee, 1996). In the Site vicinity, the Saugus Formation ranges in thickness from 2,100 to 2,500 feet to the northeast of the fault, and from 3,800 to 5,000 feet to the southwest of the fault and occupies a local depression.

Locally, Saugus Formation consists of light gray-white to brown arkosic sandstone and pebble conglomerate with finer grained reddish siltstone and mudstone interbeds referred to as "red beds". Sediments range from moderately well bedded to massive. The sandstone beds are thicker than the red beds and range from several feet to several tens of feet in thickness. Red beds are generally only a few feet in thickness but are occasionally 10 to 15 feet thick and consist of mudstone, siltstone, and claystone. The sandstone beds represent fluvial (stream) deposits, and some of the red beds appear to be old buried paleosols (ancient soil deposits). Other finer grained silt beds may represent ancient over-bank flood deposits (GeoSoils, 2000).

3.6 Soil

3.6.1 Soil Types

An overview of the soil present at the Bermite facility was derived from the "Report and General Soil Map, Los Angeles County, California" dated June 1967 (revised 1969) and prepared by SCS (1969). According to this report, soil at the Bermite facility is composed of two associations (types) of Group III soil (soil of the uplands). The two soil associations mapped at the facility are separated along a northwest-southeast trend that apparently corresponds to the trend of the main ridgeline at the facility.

The southwest portion of the Bermite facility is mapped as having soil of the Agua Dulce-Ojai association (#31), which generally occurs on steep foothills with 30 to 50 percent slopes. The northeast portion of the facility is mapped as having eroded soil of the Balcom-Castatic-Saugus association (#40), which generally occurs on steep mountains with 30 to 50 percent slopes. These soil associations are characterized by having rain runoff, high erosion hazard, moderately slow to moderate subsoil permeability, low to moderate inherent fertility, and good drainage (SCS, 1969). They are used for range, wildlife habitat, and watershed.

Additional soil information was obtained from the "Soil Survey, Antelope Valley Area, California" (SCS, 1970). According to this report, soil at the Bermite facility is composed of seven units (OgC, OgF, HcC, YoC, ScF, and ScF2). The seven units are grouped into three units of the Ojai series to the southwest of the main ridge line at the facility, and into the Hanford, Yolo, and two units of the Saugus series to the northeast of the ridge line. Characteristics of the seven soil units are described below.

Soil of the Ojai series is well-drained loam that occurs on terraces and foothills and is mostly used for range, wildlife habitat, watershed, and residential development. Slopes with soil of the Ojai series range from two to nine percent (unit OgC) with associated moderately slow permeability, slow to medium runoff, and slight to moderate erosion hazard, 15 to 30 percent (unit OgE) with associated medium to rapid runoff, moderate to high erosion potential, and localized areas of moderate sheet and rill erosion, and 30 to 50 percent (unit OgF) with associated rapid runoff, high erosion.

3.6.2 Background Chemical Concentrations in Soil

A soil background chemical data file was previously established for the Site by AME in 1997. The background study included: 1) identification of soil types, soil strata, and hydrologic features at the Site; 2) selection of sampling locations in each soil type area; 3) determination of a statistically acceptable sample size; 4) evaluation of summary statistics and potential outliers within each soil type; 5) statistical evaluation of the potential for combining data from different soil types; and 6) creation of a master background data set that is representative of the entire Site. The results of the study was the development of a single background data set, considered representative of background for all soil types at the Site (AME, 1997). A summary table of the background analysis results for inorganic compounds is presented in Appendix C.

3.6.3 Soil Physical Parameters

The physical characteristics of the soil at the Bermite facility are discussed briefly in this section. The information presented has been obtained from soil physical parameter tests performed by AME in support of feasibility study and risk assessment activities at the Site. The physical parameter tests included: porosity, permeability, wet bulk density, total organic carbon (TOC), and grain size distribution. In addition to the work performed by AME, PSE conducted soil testing as part of a feasibility study for future development. A total of 75 auger borings were advanced to collect soil samples for the following physical parameter tests: maximum dry density, optimum moisture content, grain size, remolded and undisturbed shear strength, expansive soil characteristics, and consolidation determinations. The results of PSE's investigation are contained in the report entitled "Geotechnical Feasibility Report Bermite Property" dated May 28, 1990 (PSE, 1990).

Soil samples were collected by AME for physical parameter analyses from Areas 11, 14, and 55, at depths ranging between 6 and 155 feet. The porosity of the soil samples analyzed ranged between 20.7 and 46 percent. The average porosity reported was 35.5 percent. The permeability of the soil samples analyzed ranged between 9.99E-05 and 2.20E-08 centimeters per second (cm/sec), and the wet bulk density ranged between 1.42 and 2.1 grams per cubic centimeter (g/cm^3). The TOC content of the soil samples analyzed varied between less than 50 to 6,100 milligrams per kilogram (mg/kg). The grain size distribution of four soil samples analyzed indicated that the predominant particle size (approximately 83 to 89 percent by weight) is in the sand

range. The percentage of fine-grained material ranged between approximately 6 and 12 percent, and coarse-grained gravels varied between zero and eight percent.

The results of chemical analyses performed on soil samples collected at the Bermite facility were reported on a dry-weight basis. As such, the percent moisture for each sample submitted for chemical analyses was determined by the laboratory. The percentage of moisture for all soil samples submitted for chemical analyses (over 1,000 soil samples) ranged between 0.90 and 61 percent. The average percent moisture was 9.62.

3.7 Hydrogeology

There are two regional aquifers in the vicinity of the Site: the Alluvial Aquifer and the Saugus Aquifer. The terrace deposits that overlie the Saugus Aquifer southwest of the San Gabriel Fault are typically unsaturated. Perched groundwater is encountered in some areas of the elevated inland portions of the Site, most commonly at the contact between the terrace deposits and the Saugus Formation. Perched water also occurs locally at or beneath contacts of fills with underlying formations.

3.7.1 Alluvial Aquifer

The Alluvial Aquifer is associated with the Santa Clara River system including its main channels and tributaries. The main river channel runs east to west down the middle of Soledad Canyon just beyond the Site's northern boundary. The south fork runs south to north just beyond the Site's western boundary. To the north of the Site, the river valley deposits are approximately a half-mile in width. To the west of the Site, the river channel deposits are approximately a mile wide across Bouquet Canyon. The depth of the alluvial deposits in the immediate Site vicinity are currently unknown but are assumed to be approximately 200 feet deep below the center of the river channel. The alluvium typically thins or pinches out near the flanks of the adjoining hills. At the base of the tributary canyons that form the Site's principal drainages, alluvial deposits in the bottom of the tributary drainages interfinger with sediments deposited in the main river channel.

Near the main river channel to the north of the Site, alluvial groundwater elevations at MW-75-5 (casing elevation of 1,217 feet MSL) measured since 1997 have ranged from about 11 to 60 feet in depth (1,205 to 1,158 feet relative to mean sea level [MSL]) with a westerly gradient. As of April 2006, the depth-to-groundwater at MW-75-5 was approximately 13 feet. To the west of the Site, alluvial groundwater depths at wells AL-3 (casing elevation of 1,194 feet MSL) and AL-6 (casing elevation of 1,170 feet MSL) were at approximately 85 and 60 feet (approximately 1,109 and 1110 feet MSL) respectively in October 2005 with an overall northerly gradient (CH2M Hill, 2005). In general, the direction of alluvial groundwater flow corresponds to the flow of the river and its tributaries. There is an area of converging groundwater flows where the south fork of the Santa Clara River discharges into the main river channel near Bouquet Junction.

The alluvial water table is recharged primarily by surface water runoff. To the north of the Site, however, the upper intervals of the Saugus Aquifer discharge into the alluvial basin. To the west of the Site and south of the fault, the alluvial groundwater table recharges the upper water-bearing intervals of the underlying Saugus Aquifer.

3.7.2 Saugus Aquifer

The regional Saugus Aquifer is present throughout the Site and vicinity and underlies the Alluvial Aquifer under the northern areas of the Site. The Saugus Aquifer consists of a series of discrete leaky water-bearing zones that occupy the more permeable intervals (sandstones and conglomerate) of the Saugus Formation, typically under confined to semi-confined conditions. Recent subsurface investigations in the Site vicinity indicate that the confining beds generally dip roughly 20 degrees to the northwest.

Within the Site boundaries, the San Gabriel Fault is interpreted to create a hydraulic boundary or barrier within the Saugus Aquifer. South of the San Gabriel Fault in the elevated interior areas of the Site where the Saugus Aquifer is overlain by terrace deposits, depth-to-groundwater at well MW-1 (casing elevation of 1,561 feet MSL) has ranged from approximately 460 to 520 feet (about 1,040 to 1,100 feet MSL) and is currently at about 463.77 feet (1,097.55 feet MSL) (Knight Piésold, 2007). In this portion of the Saugus Aquifer the overall gradient is believed to be to the northwest, but is locally influenced by the San Gabriel Fault zone and a fairly extensive network of groundwater production wells to the north and west of the Site.

North of the fault where the Saugus Formation is generally exposed, the potentiometric surface of the Saugus Aquifer is about 130 to 200 feet higher. At well 21-MW-1, groundwater in what is believed to be the regional Saugus Aquifer was measured at approximately 60 feet (1,375 feet MSL) in 2006 (ENVIRON, 2007a). At well MP-3, groundwater in the Saugus Formation was measured at depths ranging from 60 to 125 feet (1,262 to 1,326 feet MSL) (CH2M Hill, 2003). In this portion of the Saugus Aquifer the overall gradient and direction of flow are currently under investigation (ENVIRON, 2007a).

The most prominent area of recharge of the Saugus Aquifer in the Site vicinity is south of the fault where the Saugus is recharged by infiltration from the Alluvial Aquifer along the Santa Clara River and its tributaries. It is assumed that there is relatively little direct recharge from surface water infiltration in the elevated interior portions of the Site due to the combined effects of the relatively great depth to water (400 to 500 feet), the steep slopes, and the relatively low levels of annual precipitation (approximately 15 inches).

3.7.3 Perched Groundwater

Perched water has been encountered in the inland areas of the Site during past and recent remedial investigations of OU1, OU2 and OU3 (ENVIRON, 2007a). The occurrence and extent of perched water at the Site is highly variable and discontinuous.

In general, the perched water in OU1Ds (Area 26), OU2 and OU3 has recently been recognized to occur at depths ranging from approximately 125 to 200 feet (approximately 1,350 to 1,400 feet MSL) at the interface of the terrace deposits and underlying Saugus Formation (ENVIRON, 2007a), and in the uppermost Saugus formation (OU3).

Perched water has also been found in OU3 (Area 17) and OU1E (Area 55). In Area 17 the perched water was found at approximately 1,500 to 1,520 ft MSL (AME, 1997a), and is expected to occur within or at the base of landfill materials. In Area 55 the perched water was found at approximately 1,565 ft MSL within the mapped main trace of the San Gabriel Fault zone. The Area 55 perched water has been interpreted to be associated with the contact between fill and underlying Saugus Formation (AME, 1997a). An alternative explanation is trapping of water within a localized zone in the upper Saugus Formation where steeply dipping beds intersect the fault.

3.8 Ecosystem Components and Characteristics

This section describes the ecosystem components and characteristics in the vicinity of the Bermite facility. A biological constraints survey was conducted at the Bermite facility by Bonterra Consulting (Bonterra) in 2006 (Bonterra, 2006). The following sections are excerpts from the Bonterra report, which is included as Appendix D.

3.8.1 Vegetation

The Site is dominated by coastal scrub and chamise chaparral. Other vegetation types present include holly-leaf cherry, California annual grassland, southern cottonwood-willow riparian, mule fat scrub, Mexican elderberry, and coast live oak. Areas of unvegetated wash and developed, disturbed, and ornamental areas are also present. All vegetation types and other areas present on the Site are shown in Appendix D, Exhibit 3-1 and described below. Detailed vegetation maps are shown in Appendix D, Exhibits 3-2 to 3-8.

3.8.1.1 Scrub and Chaparral Vegetation Types

Coastal scrub is present across the Site, which is dominated by California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), purple sage (*Salvia leucophylla*), black sage (*Salvia mellifera*), and deerweed (*Lotus scoparius*). Other species present include Mexican elderberry (*Sambucus mexicana*), thick-leaf yerba santa (*Eriodictyon crassifolium*), and great basin sagebrush (*Artemisia tridentata*).

Chamise chaparral is also present across the Site, which is dominated by chamise (*Adenostoma fasciculatum)*. This vegetation type is co-dominated in many areas by black sage, in a few areas by hoaryleaf ceanothus (*Ceanothus crassifolius*), and in one small area near the western Site boundary by scrub oak (*Quercus berberidifolia*). Other species present include the coastal scrub species mentioned above, along with mountain mahogany (*Cercocarpus betuloides*), toyon (*Heteromeles arbutifolia*), laurel sumac (*Malosma laurina*), and everlasting (*Gnaphalium* sp.). Both the coastal scrub and chamise chaparral vegetation types have a patchy distribution across the Site, and intergrade to a great extent with each other and with the other vegetation types listed below.

Holly-leaf cherry is present mainly along an east-west trending drainage in the central portion of the Site. This vegetation type is dominated by holly-leaf cherry (*Prunus ilicifolia*). Other species present include thick-leaf yerba santa, California sagebrush, Mexican elderberry, mountain mahogany, and everlasting.

3.8.1.2 Grass- and Herb-Dominated Vegetation Types

California annual grassland is present mainly in the southeastern portion of the Site, but also occupies small patches throughout the Site. It is dominated by a mixture of non-native grassland species, including wild oats (*Avena* spp.), foxtail chess (*Bromus madritensis* ssp. *rubens*), ripgut grass (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), tocalote (*Centaurea melitensis*), black mustard (*Brassica nigra*), and shortpod mustard (*Hirschfeldia incana*). Weedy native species also found scattered throughout this vegetation type include telegraph weed (*Heterotheca grandiflora*), doveweed (*Eremocarpus setigerus*), California aster (*Lessingia filaginifolia*), and annual bursage (*Ambrosia acanthicarpa*).

3.8.1.3 Riparian and Bottomland Habitat Vegetation Types

Southern cottonwood-willow riparian is present in scattered drainage bottoms throughout the Site. It is dominated by Fremont cottonwood (*Populus fremontii*) and red willow (*Salix laevigata*). Other species present include Mexican elderberry, holly-leaf cherry, and mule fat (*Baccharis salicifolia*).

Mule fat scrub is also present in scattered drainage bottoms throughout the Site. It is dominated by mule fat. Other species present include sacapellote (*Acourtia microcephala*) and California sagebrush.

Mexican elderberry is found on the Site in scattered drainage bottoms and low flat areas and is dominated by Mexican elderberry. Other species present include giant wild rye (*Leymus condensatus*), sacapellote, annual bursage, mule fat, toyon, and holly-leaf cherry.

Unvegetated wash is found in drainage bottoms generally devoid of vegetation, possibly due to scouring during storm events, but may occasionally support riparian species such as mule fat.

3.8.1.4 Broad-Leafed Upland Tree-Dominated Vegetation Types

Coast live oak is present in small patches throughout the Site and is dominated by coast live oak (*Quercus agrifolia*), although an occasional valley oak (*Quercus lobata*) is present in the extreme western portion of the Site. Other species present include toyon, holly-leaf cherry, Mexican elderberry, and groundsel (*Senecio flaccidus*).

3.8.1.5 Other Areas

Developed areas on the Site include all paved areas and structures, including the Santa Clarita Metro Link Station and approximately 20 buildings near the Site entrance referred to as the Lower Compound. Disturbed areas on the Site include dirt roads, fire breaks, and other mechanically disturbed areas that are generally devoid of vegetation. An ornamental area is present within Parcel 1 in the northern portion of the Site, adjacent to developed areas, and consists of a landscaped planting of non-native acacia (*Acacia* sp.).

3.8.2 Wildlife Habitat

The Site provides moderate to high quality habitat for wildlife species. A wide variety of common wildlife species have been observed on the Site during previous and current biological surveys and construction monitoring undertaken by BonTerra Consulting.

Common amphibian species observed on the Site during biological surveys and construction monitoring include western toad (*Bufo boreas*), Pacific treefrog (*Pseudacris* [*Hyla*] *regilla*), and California tree frog (*Pseudacris* [*Hyla*] *cadaverina*). Common reptile species observed on the Site during biological surveys and construction monitoring include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), southern alligator lizard (*Elgaria multicarinata*), coachwhip (*Masticophis flagellum*), common kingsnake (*Lampropeltis getula*), California whipsnake (*Masticophis lateralis*), gopher snake (*Pituophis catenifer*), and western rattlesnake (*Crotalus oreganus*).

Some common bird species observed on the Site during biological surveys and construction monitoring include turkey vulture (*Cathartes aura*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), mourning dove (*Zenaida macroura*), greater roadrunner (*Geococcyx californianus*), great horned owl (*Bubo virginianus*), Anna's hummingbird (*Calypte anna*), Costa's hummingbird (*Calypte costae*), northern flicker (*Colaptes auratus*), black phoebe (*Sayornis nigricans*), Say's phoebe (*Sayornis saya*), ash-throated flycatcher (*Myiarchus cinerascens*), western kingbird (*Tyrannus verticalis*), western scrub jay (*Aphelocoma californica*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), northern rough-winged swallow (*Stelgidopteryx serripennis*), bushtit (*Psaltriparus minimus*), Bewick's wren (*Thryomanes bewickii*), house wren (*Troglodytes aedon*), blue-gray gnatcatcher (*Polioptila caerulea*), wrentit (*Chamaea fasciata*), northern mockingbird (*Mimus polyglottos*), California thrasher (*Toxostoma redivivum*), yellow-rumped warbler (*Dendroica coronata*), spotted towhee

(*Pipilo maculates*), California towhee (*Pipilo crissalis*), white-crowned sparrow (*Zonotrichia leucophrys*), western meadowlark (*Sturnella neglecta*), house finch (*Carpodacus mexicanus*), lesser goldfinch (*Carduelis psaltria*), and house sparrow (*Passer domesticus*).

Several buildings on the Site have entrances available to bats and owls, and many buildings have attics with holes in the ceiling that would allow for bat and owl occupation. Owl casts are abundant on some floors, indicating that roosting and probably nesting occurs in some buildings. Barn owls (*Tyto alba*) were observed during the current survey, as was a historic and recently active raven nest within an abandoned building.

Some common mammal species observed on the Site during biological surveys and construction monitoring include Audubon's (desert) cottontail (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), Pacific kangaroo rat (*Dipodomys agilis*), California pocket mouse (*Perognathus californicus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and mule deer (*Odocoileus hemionus*).

3.8.3 Special Status Vegetation Types

Special status vegetation types are considered to be "depleted" habitats by the CDFG and other resource agencies. They are typically protected by ordinance, code, or regulation under which conformance typically requires a permit or other discretionary action prior to impacting the habitat. Several special status vegetation types occur on the Site: holly-leaf cherry, coast live oak, southern cottonwood-willow riparian, mule fat scrub, Mexican elderberry, and, to a limited extent, unvegetated wash. In addition, coastal sage scrub covers many areas of the Site and is considered a special status vegetation type because of its limited distribution in southern California and its potential to support special status plant and wildlife species.

Oak trees identified on the Site include scrub oak, coast live oak, and valley oak. The oak trees on the Site are subject to the Los Angeles County Oak Tree Ordinance Section 22.56.2060. Oak trees are also protected under the City of Santa Clarita's Ordinance No. 89-10, called the "City of Santa Clarita Oak Tree Preservation Ordinance."

3.8.4 Special Status Plant and Wildlife Species

Plants or wildlife may be considered to have "special status" due to declining populations, vulnerability to habitat change, or restricted distributions. Certain special status species have been listed as threatened or endangered under state and/or federal Endangered Species Acts (ESAs).

3.8.4.1 Special Status Plants

Fourteen special status plants are known to occur in the vicinity of the Site. Of these, seven are not expected to occur on the Site due to lack of suitable habitat. Three plant species that are federally and/or state-listed as endangered have the potential to occur on the Site. These species are Braunton's milk-vetch (*Astragalus brauntonii*), Nevin's barberry (*Berberis nevinii*), and San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*). These species are described further below.

Braunton's Milk-Vetch

Braunton's milk-vetch is a federally listed endangered species. This stout perennial typically blooms from February to June and occurs in brushy places and along firebreaks, typically in chaparral, at elevations below approximately 1,500 feet above msl. This species is associated with disturbed areas. It also occurs in closed-cone coniferous forest, coastal scrub, and valley and foothill grassland, especially in areas with recent burns or disturbance. This species is known from Ventura, Los Angeles, Riverside, and Orange counties.

Nevin's Barberry

Nevin's barberry is a federally and state-listed endangered species. It typically blooms in March and April. This large perennial shrub grows in sandy and gravelly places in sage scrub and chaparral habitats in Los Angeles County. In the project vicinity, this species has been observed in San Francisquito Canyon.

San Fernando Valley Spineflower

San Fernando Valley spineflower is a federally listed Candidate and state-listed endangered species. This annual herb typically blooms between April and June. It is found in dry sandy places below approximately 2,500 feet above msl, mostly in coastal sage scrub. This species was historically known from the San Fernando Valley, Newhall, Castaic, and Elizabeth Lake areas and was presumed extinct until it was rediscovered at Ahmanson Ranch in Ventura County in 1999. In the project vicinity, this species has been reported at the Magic Mountain Entertainment Site, south of the Santa Clara River and west of Interstate-5, and at Newhall Ranch.

In addition, several other plant species considered special status by the CNPS have the potential to occur on the Site. These include slender mariposa lily (Calochortus clavatus var. gracilis), Plummer's mariposa lily (Calochortus plummerae), Los Angeles sunflower (Helianthus nuttallii ssp. parishii), and short-joint beavertail (Opuntia basilaris var. brachyclada). Slender mariposa lily was observed on the Site during focused plant surveys performed in designated areas within Operable Unit 1 during spring 2006. These plant species are considered CNPS List 1B or 2 species, which indicates that they are considered rare, threatened, or endangered within California by the CNPS.

3.8.4.2 Special Status Wildlife

Several special status wildlife species are known to occur in the vicinity of the Site; however, only threatened or endangered species typically present constraints to development. Eight federally or state-listed threatened or endangered species are known to occur in the project region and include: Santa Ana sucker (*Catostomus santaanae*), unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), mountain yellow-legged frog (*Rana mucosa*), arroyo toad (*Bufo californicus*), least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), and coastal California gnatcatcher (*Polioptila californica californica*). Only the least Bell's vireo and California gnatcatcher have the potential to occur on the Site. The other species are not expected to occur on the Site due to lack of suitable habitat. The species with a potential to occur on the Site are described further below.

Least Bell's Vireo

Least Bell's vireo is a federally and state-listed Endangered species. A small amount of marginally suitable foraging and nesting habitat occurs within the "OU1D South" drainage in the southeastern portion of the Site.

On February 2, 1994, U.S. Fish and Wildlife Service (USFWS) published the final critical habitat designation for the least Bell's vireo designating approximately 37,560 acres of land in Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, and San Diego counties in California. The Site is not located within the designated critical habitat area for this species.

Coastal California Gnatcatcher

The coastal California gnatcatcher (gnatcatcher) is a federally listed Threatened songbird, and is a State of California Species of Special Concern. This species occurs within various associations of sage scrub vegetation, and surrounding low density chaparral. In referring to a data set provided by the USFWS that pinpoints gnatcatchers within the general region of the Site, these data show recent records of the species as close as a mile and a quarter east of the Site border .

On October 24, 2000, the USFWS published a final rule designating 513,650 acres of land as critical habitat for the coastal California gnatcatcher in the Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties in California. Following the designation of critical habitat, several lawsuits were filed challenging various aspects of the designation. In response to these lawsuits, the critical habitat designation was vacated and the USFWS was instructed by the court to re-evaluate its previous position. A new proposed critical habitat designation was published on April 24, 2003, covering 495,795 acres. However, as of this date, this proposed rule has not been finalized; therefore, the October 24, 2000, final rule remains in effect. The Site is located outside and west of areas designated under both the (previous) final and (new) proposed critical habitat designation.

Special status wildlife species that have been observed on the Site during previous biological surveys or construction monitoring by BonTerra Consulting include the western spadefoot (*Spea hammondii*), coastal western whiptail (*Aspidoscelis [Cnemidophorus] tigris stejnegeri*), white-tailed kite (*Elanus leucurus*), Cooper's hawk *Accipiter cooperii*), rufous hummingbird (*Selasphorus rufus*), loggerhead shrike (*Lanius ludovicianus*), yellow warbler (*Dendroica petechia*), rufous-crowned sparrow (*Aimophila ruficeps*), Bell's sage sparrow (*Amphispiza belli*), Lawrence's goldfinch (*Carduelis lawrencei*), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), and San Diego desert woodrat (*Neotoma lepida intermedia*). None of these species are listed as Threatened or Endangered. However, the presence of these species may be considered constraints per Section 15380 of CEQA.

Section 4
Summary of Remedial Investigations

This section provides a brief summary of the RIs conducted for OUs 2 through 6. The scope of the RIs expanded upon the findings of the historic investigations and was generally consistent with the historic findings; however, certain findings of the RI activities were inconsistent with historic investigations; and therefore, the RI activities needed to be further expanded. The historic investigations are not discussed herein, since their results are incorporated to the recent RI activities Additionally, as the shallow soils for OU1 were already addressed in the OU1 FS, remedial action plan (RAP), and RD, only "deep" soil results of OU1 are discussed herein.

4.1 Chemical Impacts in Soils

The primary contaminants detected during the Site-wide RI are perchlorate and volatile organic compounds (VOCs) (primarily chlorinated hydrocarbons). As presented in the Site-wide RI report (CDM, 2006), the distribution and extent of perchlorate-impacted soil in the subsurface were illustrated in concentration contour maps developed for soils in the 0 to 40 feet depth range and soils in the 41 to 200 feet depth range. Those concentration contour maps are presented herein as Figures 4-1 and 4-2, respectively, for reference purposes. The contour intervals for perchlorate concentrations, which were selected based on preliminary risk-threshold concentrations, were set at 20 (detection limit), 500, 5,000, and 28,000 micrograms per kilogram (µg/kg).

Similarly, as presented in the Site-wide RI report, the distribution and extent of VOC-impacted soil in the subsurface were illustrated in concentration contour maps for VOCs in soil gas for soils in the 0 to 40 feet depth range and soils in the 41 to 200 feet depth range. Those concentration contour maps are presented herein as Figures 4-3 and 4-4, respectively, for reference purposes. The soil-gas data was selected as the primary indicator to illustrate the distribution of VOCs in the subsurface, as soil-gas data is generally considered a better measure than soil-matrix data for evaluation of VOC-impacted soil, particularly within coarser-grained soils, such as those encountered at the Site. However, for areas where there was very little soil-gas data below 40 feet, soil-matrix data was used for contouring the 40 to 200 feet depth range. The contour intervals for VOCs concentrations were selected at 1; 10; 1,000; and 10,000 (micrograms per liter [µg/L] for soil gas and µg/kg] for soil matrix).

As stated by DTSC in their letter of approval of the Site-Wide RI, the nature and extent of chemical impacts to the soil at the Site have been adequately defined for the purposes of remedial evaluation and planning. However, in some areas and for some specific compounds, collection of additional data may be warranted in order to complete detailed remedial design plans. It is anticipated that any additional data needs will be addressed through the collection of pre-design data, performance monitoring and sampling during pilot studies or full-scale operations, and/or the collection and analysis of confirmation samples.

Summaries of the RI results, separated by OUs, are presented in the following sections.

4.1.1 OU1

Remediation of chemically impacted soils in OU1, for the most part, has been completed through SVE for VOCs and excavation and ex-situ enhanced bioremediation for perchlorate. SVE operations in certain areas of OU1 are still ongoing, but are expected to be completed in the near future. In the areas of perchlorate impact, soils were excavated to "practical depth of excavation" and treated. As previously mentioned, only the deep soils not addressed by the OU1 FS, RAP, and RD (depths greater than 40 feet, except Area 55, where excavation and treatment of impacted soils extended to greater than 70 feet due to the steep hill-side slope) are summarized herein:

- The results of the RI indicated that the deep soil in certain areas of OU1 has been impacted, primarily by perchlorate, and to a lesser degree, by VOCs.

- The areas with deep soil perchlorate impacts in OU1 include OU1E (Areas 7, 43, 55, and Building 329) and OU1Ds (Area 26). Area 7 had detectable concentrations of perchlorate extending to a least 110 feet, with the highest concentration (14,000 µg/kg) reported at 110 feet; Area 26 had detectable concentrations of perchlorate extending to at least 190 feet, with the highest concentration (14,000 µg/kg) reported at 65 feet.; Area 43 had detectable concentrations of perchlorate extending to at least 200 feet, with the highest concentration (510 µg/kg) reported at 200 feet; Area 55 had detectable concentrations of perchlorate extending to at least 85 feet, with the highest concentration (19,000 µg/kg) reported at 80 feet; Building 329 had detectable concentrations of perchlorate extending to at least 50 feet, with the highest concentration (1,400 µg/kg) reported at 50 feet. Additionally, one boring drilled in the roadway north of Area 55 (OU1A-DB-03) had detectable concentrations of perchlorate extending to at least 200 feet, with the highest concentration (4,200 µg/kg) reported at 170 feet.

- The areas with deep soil VOC impacts in OU1 include OU1E (Areas 7, 43, 55, and Building 329). Area 7 had detectable concentrations of trichloroethene (TCE) extending to 140 feet, with the highest concentration (1,800 µg/kg) reported at 110 feet; Area 43 had detectable concentrations of TCE, tetrachloroethene (PCE), and cis-1,2-dichloroethene (cis-1,2-DCE) extending to at least 200 feet, with the highest concentrations (TCE – 780 µg/kg; PCE – 6.3 µg/kg; cis-1,2-DCE – 6.8 µg/kg) all reported 200 feet; Area 55 had detectable concentrations of TCE extending to 110 feet, with the highest concentration (88 µg/kg) reported at 80 feet; Building 329 had detectable concentrations of TCE and PCE extending to at least 50 feet, with the highest concentrations (TCE - 15 µg/kg; PCE - 5.4 µg/kg) reported at 50 feet.

4.1.2 OU2/OU6

The results of the RI for OU2/OU6 are summarized as follows:

- The results of the RI indicated that the soil in certain areas of OU2/OU6 has been impacted, primarily by perchlorate, and to a lesser degree, by VOCs.

- Almost all areas investigated had some degree of perchlorate impacts. Areas 1, 1AN, 1AS, 4, 6, 19, 22, 25, 27, 28, 34, 37, 54, 58, 72, and 74 had reported concentrations exceeding 500 µg/kg, and Areas 1AS, 22, 25, 27, 34, 37, 54, 58, 63, 72, and 74 had reported concentrations exceeding 5,000 µg/kg. All areas except Area 1AN had impacted soil to depths greater than 40 feet. Areas 1, 1AS, 25/34, and 74 had deep soils impacts likely extending beyond a depth of 200 feet.

- Several areas had some degree of VOC impacts. Areas 1, 1AN, 1AS, 4, 6, 9, 19, 27, 28, 34, 36, 37, 53, 54, 56, 58, 63, and 72 all had total soil-gas VOC concentrations in excess of 1 µg/L, but only Areas 1, 1AS, 6, 19, 27, 34, 53, and 54 had total soil-gas VOC concentrations in excess of 10 µg/L. Areas 1 and 54 appear to be the areas that exhibit evidence of a significant source or release. In Area 1, TCE was detected at concentrations up to 240 µg/kg (soil-matrix) and 2,700 µg/L (soil-gas); and VOC impacts in Area 1 persist throughout the soil column and extend beyond a depth of 200 feet. Previous soil remediation operations for Area 1 included the excavation of between 50,000 and 60,000 cubic yards of soil to a depth of approximately 60 feet, followed by SVE operations from 1988 through 2002, during which approximately 40,000 pounds of VOCs were extracted and treated. In Area 54, PCE was detected at concentrations up to 110 µg/kg (soil-matrix) and 84 µg/L (soil-gas); TCE was detected at concentrations up to 280 µg/kg (soil-matrix) and 700 µg/L (soil-gas); and VOC impacts in Area 54 persist throughout the soil column and extend to a depth of approximately 120 feet.

- A soil vapor extraction (SVE) system performance test conducted in Area 1 (OU6) indicated that VOC concentrations were substantially reduced near the extraction wells after several days of operation. VOC concentrations were observed to increase in several of the SVE probes further away from the extraction wells, likely due to the system drawing soil gas toward the extraction system.

- Metals concentrations exceeding the maximum Site background levels were encountered in every area sampled. In most cases, the exceedances were not significantly higher than the background levels, and may still represent natural conditions. Furthermore, the exceedances were generally sporadic, without a discernable pattern, represented a small percentage of the samples analyzed, and were not indicative of a specific release or source area. In the few cases where the concentrations appeared to be substantially higher than the background levels (Areas 3, 6, and 44), the occurrences were still limited in extent.

- Polynuclear aromatic hydrocarbons (PAHs) were detected in one soil sample collected from Area 27, and dioxins and furans were detected in eight samples collected from Area 3. In both cases, the impacts were limited in extent and do not appear represent a significant release or source area.

- A small area of titanium tetrachloride ampoules was encountered during the RI in Area 9. These ampoules were excavated and taken off site for disposed in 2005.

- Up to nine feet of fill materials were identified in Area 37, which has been named the "Point Landfill". However, no debris or other evidence of landfill material was found in this area.

4.1.3 OU3

The results of the RI for OU3 are summarized as follows:

- The results of the RI indicated that the soil and bedrock in certain areas of OU3 have been impacted, primarily by perchlorate and VOCs.

- Perchlorate-impacted soil/bedrock was encountered in Areas 14 and 17. Area 14 is impacted by perchlorate, with concentrations up to 316,000 µg/kg. Perchlorate concentrations exceeding 1,000 µg/kg persisted throughout the soil/bedrock column to the maximum depth sampled (200 feet) at three boring locations along the central axis of the valley. Perchlorate impacts in Area 17 were less, with the maximum concentration being 756 µg/kg, and the vertical extent limited to the upper 40 feet of soil.

- Areas 14, 17, 30, and 76 had some degree of VOC impacts, but only Areas 14 and 30 exhibited evidence of a significant source or release. Area 14 is impacted by elevated concentrations of VOCs, primarily chlorinated hydrocarbon compounds. PCE was detected at concentrations up to 3,100,000 µg/kg (soil matrix) and 3,100 µg/L (soil gas); TCE was detected at concentrations up to 1,200 µg/kg (soil matrix) and 210,000 µg/L (soil gas), and VOC impacts in Area 14 persist throughout the soil/bedrock column and extend beyond a depth of 200 feet. Detectable VOC concentrations also extend beyond a depth of 200 feet in Area 30, but the magnitude of impact is far less severe.

- Metals concentrations exceeding the maximum Site background levels were encountered in every area sampled. In most cases, the exceedances were not significantly higher than the background levels, and may still represent natural conditions. Furthermore, the exceedances were generally sporadic, without a discernable pattern, represented a small percentage of the samples analyzed, and were not indicative of a specific release or source area. In the few cases where the concentrations appeared to be substantially higher than the background levels (nine locations in Area 14 and five locations in Area 17), and the occurrences were limited in extent.

- Limited semi-volatile organic compounds (SVOCs), nitramines and nitroaromatics, and phosphorous were detected in some of the soil samples. The extent of these compounds has been generally delineated through the trench and soil boring sampling data.

- Depleted uranium (DU) is present in Area 57 due to former firing range operations. The nature and extent of residual DU fragments in soil have been assessed by a specialty contractor (Energy Solutions). The report of the DU impact assessment and a work plan for removal of DU-impacted soil (Energy Solutions, 2009) was submitted to and approved by DTSC and the Department of Public Health-Radiological Health Branch. A removal action to address the DU-impacted soil was initiated in early 2010 and it expected to be completed by summer 2010.

- The East Fork Landfill (Area 17) was reported to have accepted non-hazardous solid waste generated from the Site operations between approximately 1965 and 1986. During the RI, fill was encountered at 23 sample locations and the depth of fill throughout Area 17 ranges from 1 to 36 feet. Based on the RI results, it was estimated that Area 17 contains approximately 66,000 cubic yards of fill material. Trash and debris were encountered in the fill material observed in all of the trenches excavated in Area 17 including: asphalt, metal, wood, plastic, paper, glass bottles, drink cans, food cans, wire, cable, clothing, rope, styrofoam, cardboard, roots, and brush.

4.1.4 OU4

The results of the RI for OU4 are summarized as follows:

- The results of the RI indicated that the soil within certain areas of OU4 has been impacted by perchlorate, VOCs, and metals.

- Perchlorate impacts were generally limited to the shallow soils in the upper portion of Hula Bowl Canyon I and the stockpiled soils in Area 16A that were excavated from Hula Bowl Canyon IV.

- Elevated concentrations of VOCs, primarily TCE and other related chlorinated hydrocarbons, were detected in the upper portion of Hula Bowl Canyon I. TCE concentrations in soil gas up to 300 µg/L persisted to the maximum depth sampled (65 feet) and detectable soil-matrix concentrations persisted to a depth of 170 feet. No other significant areas of VOC impact were identified during the RI.

- Metals concentrations exceeding the maximum Site background levels were encountered in every area sampled. In most cases, the exceedances were not significantly higher than the background levels, and may still represent natural conditions. Furthermore, the exceedances were generally sporadic, without a discernable pattern, represented a small percentage of the samples analyzed, and were not indicative of a specific release or source area. In the few areas where the concentrations appeared to be substantially higher than the background levels, the

occurrences were still limited in extent within the main landfill areas of Hula Bowl Canyons I and III, and were consistent with previous investigations.

- Hula Bowl Canyons I, II, III, and IV (Area 16) were reported all reported to have accepted non-hazardous solid waste generated from the Site operations. Based on the RI results, it was estimated that Hula Bowl Canyon I contains approximately 30,000 cubic yards of fill material; Hula Bowl Canyon II contains approximately 5,000 cubic yards of fill material; and Hula Bowl Canyon III contains approximately 2,500 cubic yards of fill material. Hula Bowl Canyon IV, which was excavated and screened as part of an USACE Technologies Demonstration project, previously contained approximately 8,100 cubic yards of fill material. Approximately 2,800 cubic yards of screened soil remains stockpiled at the head of the canyon. Trash and debris were encountered in the fill material observed in Hula Bowl Canyons I, II, and III including: metal, wood, plastic, paper, cans, glass, nails, tires, fire hose, chain link fence, porcelain, styrofoam, appliances, drums, and other miscellaneous trash items.

4.1.5 OU5

The results of the RI for OU5 are summarized as follows:

- The results of the RI indicated that the soil in certain areas of OU5 has been impacted, primarily by perchlorate and VOCs.

- Areas 2, 12, 13, 33, 46, 50, 51, and 61 had reported perchlorate concentrations exceeding 500 µg/kg, and Areas 13, 33, 46, and 51 had reported perchlorate concentrations exceeding 5,000 µg/kg. In most areas the extent of perchlorate-impacted soil was limited to the upper 40 feet, but detectable concentrations of perchlorate were reported below 40 feet in Area 2 (130 feet), Area 11 (50 feet), and Area 33 (130 feet).

- Several areas had some degree of VOC impacts. In general, VOC detections were minimal and not indicative of significant sources or releases, with the exception of Areas 2, 33, 45, and 48/49. TCE and PCE were the primary VOCs detected in OU5. PCE had the highest reported concentrations in both soil gas (4,400 µg/L) and soil matrix (4,200 µg/kg) in Area 48/49, but was not detected frequently or at high concentrations outside of Area 48/49. TCE was not detected at concentrations as high as PCE, but was detected frequently, at concentrations up to 300 µg/L (soil gas) and 180 µg/kg (soil matrix). It is significant to note that during previous investigations, several areas within OU5 were reported to have detectable concentrations of vinyl chloride (VC). However, VC was not detected in soil-gas or soil-matrix samples collected during this RI. In most areas the extent of VOC-impacted soil was limited to the upper 40 feet, but detectable concentrations of VOCs in soil and/or soil gas were reported below a depth of 40 feet in Area 2 (140 feet), Area 20 (50 feet), Area 33 (60 feet), and Area 45 (62 feet).

- Metals concentrations exceeding the maximum Site background levels were encountered in every area sampled. In most cases, the exceedances were not significantly higher than the background levels, and may still represent natural conditions. Furthermore, the exceedances were generally sporadic, without a discernable pattern, represented a small percentage of the samples analyzed, and were not indicative of a specific release or source area. In the few cases where the concentrations appeared to be substantially higher than the background levels (Areas 8, 11, 20, 21, 24, 38, 41, 47, 50, 51, 60, and 69), the occurrences were limited in extent.

- SVOCs were not present in the samples collected from OU5, with the exception of isolated detections in Areas 11, 40, 48, and 60. The only notable SVOC concentration was di-n-butyl phthalate (15,000 µg/kg), which was likely associated with a small area of paint-stained soil. The isolated and relatively low concentrations detected are not indicative of a significant source or release of SVOCs in OU5.

- Nitramines and nitroaromatics (HMX, RDX, and tetryl) were detected sporadically at low concentrations in several areas within OU5. The detections were low, isolated in nature, and not indicative of a significant release or source area.

- Nitrate concentrations were generally consistent with background levels at the Site. In the cases where nitrate exceeded the Site maximum background concentration, the exceedances were not significantly higher than the background level, and may still represent natural conditions.

- Phosphorous exceeded the background concentrations established for the Site in several sampling locations within OU5. In general, the exceedances were not significantly higher than the background levels, the distribution of concentrations was relatively consistent and not indicative of a release, and may still represent natural conditions. In the few cases where the concentrations appeared to be substantially higher than the background levels, the occurrences were still limited in extent.

- A large amount of lithologic data was collected in OU5 during this and prior remedial investigations concerning the vertical and lateral extent of refuse-containing fill. The documented industrial waste landfill in Area 2 was fully delineated and encompasses an area approximately 300 feet long, by 150 feet wide, by five feet deep (approximately 8,300 cubic yards). The current investigation uncovered a previously undocumented industrial waste landfill in Area 11 that on rough estimate encompasses an area approximately 600 feet long by 200 feet wide, by five feet deep (22,000 cubic yards).

- Flare casings (Area 51), cesspools, a fuel tank, and some stained soils were encountered during the RI field work that was removed in subsequent removal actions.

- Several removal actions were conducted throughout OU5 in 2005 that addressed abandoned septic systems, petroleum hydrocarbon stained soils, flare casings, USTs, and an allegedly red phosphorous impacted area.

4.1.6 OU6

OU6, or Area 1, is the only remaining Resource Conservation and Recovery Act (RCRA) unit at the Site. As described under the Section 4.1.2, TCE was detected at concentrations up to 240 µg/kg (soil-matrix) and 2,700 µg/L (soil-gas); and VOC impacts in Area 1 persist throughout the soil column and extend beyond a depth of 200 feet. Previous soil remediation operations for Area 1 included the excavation of between 50,000 and 60,000 cubic yards of soil to a depth of approximately 60 feet, followed by SVE operations from 1988 through 2002, during which approximately 40,000 pounds of VOCs were extracted and treated. Eighty two rounds of quarterly RCRA groundwater monitoring have been performed at this area which all has shown no chemical impact to Saugus Aquifer directly under the RCRA unit. The remaining issues related to this area will be addressed in a separate closure plan and in compliance with the applicable RCRA requirements.

4.2 Chemical Impacts in Perched Groundwater

Perched groundwater has been encountered during the RI in limited areas within OU1, OU2, OU3, and OU5. The perched groundwater generally occurs at the contact between the unconsolidated terrace deposits and the underlying Saugus Formation bedrock, and in the uppermost portion of the Saugus formation (OU3). It is likely that the perched groundwater occurs where the underlying bedrock is less permeable and impedes downward infiltration (fine-grained sandstone, siltstone, and mudstone), and is absent where the underlying bedrock consists of more permeable sandstone that allows downward infiltration. The perched groundwater occurrences are limited laterally and vertically and do not appear to be connected across the Site. Figure 5-5 illustrates where perched groundwater has been encountered with the corresponding depths and chemical impacts.

The nature and occurrence of perched groundwater within the various OUs is summarized in the following sections.

4.2.1 OU1

- Perched groundwater was encountered in OU1 in the vicinity of Areas 55 and 26. The perched groundwater in Area 55 was encountered at depths ranging from approximately 29 to 68 feet. The perched groundwater in Area 55 is likely to be heavily influenced by its proximity to the San Gabriel fault. There is one perched zone monitoring well in OU1 (Area 26) that was previously monitored on a

quarterly schedule by ENVIRON. The depth-to-groundwater measured during the first quarter 2006 was 163.90 feet (1,399.46 feet MSL).

- The perched groundwater in Area 55 has been impacted by elevated concentrations of perchlorate (up to 39,000 µg/L) and TCE (up to 16,000 µg/L). The perched groundwater in Area 26 has been impacted by elevated concentrations of perchlorate (up to 74,600 µg/L).

4.2.2 OU2

- Perched groundwater was encountered in OU2 in the vicinity of Areas 1 (also designated as OU6), 1AS, 19, 25, 34, and 74. There are currently 14 perched zone monitoring wells in OU2 that are monitored on a quarterly basis by ENVIRON. The depth-to-groundwater measured during the 2nd quarter 2009 ranged from approximately 105.73 to 206.59 feet (1,326.79 to 1,406.66 feet MSL).

- The perched groundwater in OU2 has been impacted by elevated concentrations of perchlorate (up to 201,000 µg/L) and TCE (up to 16,000 µg/L).

4.2.3 OU3

- Perched groundwater was encountered in OU3 in the vicinity of Areas 14 and 17. There are currently two perched zone monitoring wells in Area 14 and one well in Area 17 that are monitored on a quarterly basis by ENVIRON. The depth-to-groundwater measured during the 2nd quarter 2009 in Area 14 ranged from approximately 112.82 to 188.43 feet (1,270.43 to 1,314.48 feet MSL). The depth-to-groundwater measured during the 2nd quarter 2009 in Area 17 was 34.02 feet (1,518.40 feet MSL).

- The perched groundwater in OU3 has been impacted by elevated concentrations of perchlorate (up to 117,000 µg/L) and PCE (up to 120,000 µg/L) in Area 14, and perchlorate (up to 14,100 µg/L) and cis-1,2-DCE (up to 9.2 µg/L) in Area 17.

4.2.4 OU5

- Perched groundwater was encountered in OU5 in the vicinity of Areas 41 and 50. There is currently one perched zone monitoring well in Area 41 and one well in Area 50 that are monitored on a quarterly basis by ENVIRON. The depth-to-groundwater measured during the 2nd quarter 2009 was 38.47 feet (1,232.94 feet MSL) in Area 41 and 34.35 feet (1,233.19 feet MSL) in Area 50.

- The perched groundwater in OU5 has been impacted by elevated concentrations of perchlorate: up to 245 µg/L in Area 41, and up to 1,150 µg/L in Area 50.

4.3 Munitions and Explosives of Concern

Pursuant to the Imminent and Substantial Endangerment Determination and Order and Remedial Action Order (DTSC, 2002), and to address the potential presence of unexploded ordnance (UXO) or "Munitions and Explosives of concern" (MEC) at the Site, Whittaker Corporation retained EOD Technologies, Inc. (EODT) to provide UXO/MEC avoidance and management support during the RI and construction activities. In addition, EODT has been tasked to provide a Site-wide assessment to determine the scope of the UXO/MEC removal activities and prepare work plans for DTSC review and approval. To accomplish this, EODT has studied the history of the operations and production items manufactured or tested at the Site and prepared the following documents:

- Work Plan for UXO/OE Investigation, Clearance, and Construction Support
- Historical Site Assessment (HSA) Report
- Geophysical Prove-out Report, and
- Work Plan Addendum for Further/No Further Investigation Sites for the Munitions and Explosives of Concern (MEC) Program.

The first two documents were submitted to and approved by the DTSC. The third document has been submitted to DTSC and currently is under review.

The purpose of the HSA was to evaluate the historical production-related assembly, testing, and waste management practices at the Site to determine if these practices have resulted in the release of UXO/MEC. The HSA evaluated the potential presence of UXO/MEC throughout the entire Site and determined that only few specific areas presented concerns of possible presence of UXO/MEC. These specific areas have been identified for future UXO/MEC assessment and removal activities. In addition, the results of the geophysical prove-out work conducted at the Site will be used to select the types of the geophysical instruments that are appropriate for detection of MEC under the specific Site conditions.

A work plan addendum to begin the first phase of the UXO/MEC assessment and removal activities at the Site was submitted to DTSC for review and approval in July 2009. The work plan addendum includes assessment and removal of MEC in specific areas of the site, including the target range (Area 57) and areas around some of the landfills where UXO/MEC are known to be present or are expected to be present.

4.4 Site Conceptual Models

In order to illustrate the various impacts at the Site and transport and exposure pathways, two general Site conceptual models have been developed. The first, which is illustrated in Figure 4-6, shows the interpreted model for the Site area located on the southwest side of the San Gabriel fault, and generally represents conditions for OU2/OU6, OU3, and OU4. The second, which is illustrated in Figure 4-7, shows the interpreted model for the Site area located on the northeast side of the San Gabriel fault, and generally represents conditions for OU5.

The presence of the San Gabriel fault, which bisects the Site from the southeast to the Northwest, has resulted in substantially different transport and exposure pathways related to groundwater impacts. On the southwest side of the fault, the impacted areas at the Site are underlain by coarse grained unconsolidated terrace deposits overlying dipping bedrock of the Saugus formation, and groundwater generally occurs within the Saugus formation at depths of several hundred feet. Within the vadose zone, chemical transport is downward through the unconsolidated terrace deposits, until it reaches the Saugus formation bedrock. In some locations, perched water occurs at the terrace deposit/Saugus formation contact. Chemical transport then proceeds downward within the Saugus formation, but is largely controlled by the dip of the bedding planes. Chemical transport within the groundwater continues downward along the bedding planes within the hydrostratigraphic units of the Saugus aquifer. Chemical transport may also occur along the surface water drainages where it could ultimately discharge to the alluvial aquifers.

On the northeast side of the fault, the impacted areas at the Site are underlain by alluvial deposits of the Santa Clara River and its tributaries overlying dipping bedrock of the Saugus formation, or directly underlain by Saugus formation. Groundwater within the Saugus formation generally occurs at relatively shallow depths (less than 100 feet), and groundwater generally occurs within the alluvial deposits of the Santa Clara river at relatively shallow depths (less than 40 feet) and fluctuate with the seasons and rainfall events. There is also an upward vertical gradient from the Saugus formation to the overlying alluvial deposits. In the downslope areas proximal to the Santa Clara River (Northern Alluvium), the chemical transport within the vadose zone is downward directly to the Northern Alluvium aquifer. In the upslope areas, chemical transport in the vadose zone is downward through the unconsolidated alluvial deposits (where present), until it reaches the Saugus formation bedrock. In some locations, perched water occurs at the alluvial deposit/Saugus formation contact. Chemical transport then proceeds downward within the Saugus formation, but is largely controlled by the dip of the bedding planes. Chemical transport within the groundwater continues downward along the bedding planes within the hydrostratigraphic units of the Saugus aquifer, but is also controlled by the presence of the San Gabriel fault, which prevents further downdip transport and diverts flow to the northwest parallel to the fault. Chemical transport may also occur along the surface water drainages where it could ultimately discharge to the alluvial aquifers.

These differences in the overall conditions of the affected media and the fate and transport of chemicals require consideration of different remedies and implementation approach. Section 7 provides a detailed discussion of remedial measures selected to address the impacts to various media and transport pathways depicted in Figures 4-6 and 4-7.

Section 5
Development of Remedial Goals

5.1 Introduction

While the remedial action objectives presented in Section 1 are general criteria that will be sought by the overall remediation plan, remedial goals, which are described in this section, are chemical and media-specific numerical target concentrations to be achieved by the remedial actions. As described previously in Section 1, the remedial action objectives of this RAP are as follows:

- Protection of human health.
- Protection of ecological receptors.
- Protection of surface water quality.
- Protection of groundwater quality.

The final remedial goals for the Site will meet these four objectives. When possible, specific remedial goals that support these objectives are presented in the following sections. As discussed in Section 1, based on the magnitude and extent of chemical impacts in specific areas of the Site, unrestricted land use may not be appropriate for approximately two percent of the entire Site area. These areas would likely be suitable for commercial and recreational land use, or designated as open space. Therefore, this RAP retains the flexibility to implement appropriate institutional and/or engineering controls for areas where reductions of the chemical impacts to levels that are suitable for unrestricted land use are not technically and/or practically feasible.

The remedial goals consider different risk tolerance levels that are appropriate for alternative land uses (e.g., commercial/industrial, multifamily residential, open space), thereby maintaining flexibility to apply differing risk-based goals should a different development plan be in place at the time of cleanup.

The achievement of remedial goals will be confirmed through sampling and analysis to demonstrate that residual concentrations of chemicals do not pose an unacceptable risk to human health or the environment. Remedial goals may also be achieved through the use of institutional controls, engineering controls, and deed restrictions.

The general approach on which the preliminary remedial goals are based was first presented in the document titled "Derivation of Soil Screening Levels for Protection of Human Health and the Environment, Submitted as Part of the Remedial Investigation Report for Operable Units 2 through 6," (ENVIRON, 2007b). The report included a Tier 1 Human Health Risk Assessment (HHRA) to evaluate potential risks to human health resulting from exposure to Site-related chemicals. A screening level assessment of potential risk at the Site under current conditions was performed by comparing existing soil and soil gas concentrations measured at the Site against risk-based target

concentrations (RBTCs) developed for the potentially exposed populations. The RBTCs represent a conservative estimate of the average concentrations of chemicals in soil or soil gas that can be present without posing an unacceptable risk to human health.

The 2007 report also included the derivation of perchlorate and VOC soil screening levels (SSLs) for the protection of groundwater at the property line, derivation of soil/sediment screening levels for protection of surface water runoff quality, and derivation of a set of perchlorate screening levels for soil and surface water for the protection of ecological receptors at the Site. All of these SSLs were developed based on the current Site conditions and do not take into account the changes to the hydrology and configuration of the Site that would likely take place under a future redevelopment plan. It is anticipated that future redevelopment would involve significant cut-and-fill activities, land cover changes, and installation of storm water collection systems and changes to natural Site drainage systems. These changes would, in general, reduce the potential for transport of chemicals of concern from soil to groundwater, surface water, and ecological receptors. In the event that an approved redevelopment plan is in place prior to the completion of cleanup efforts, then the SSLs could be re-evaluated to account for these factors.

The remainder of Section 5 is divided into five subsections. Section 5.2 summarizes the risk assessment approach and describes how the RBTCs were developed. Based on an initial screening of existing data using RBTCs, areas of the Site that may require risk management or more detailed risk analysis were identified. Section 5.2 concludes with a description of how the RBTCs can be used as remedial goals. The derivation of screening levels to protect groundwater quality, surface water quality, and ecological receptors are presented in Sections 5.3, 5.4, and 5.5, respectively. Each of these subsections concludes with a description of how the SSLs can be revised to develop remedial goals. A summary of the preliminary remedial goals is presented in Section 5.6.

5.2 Remedial Goals for Protection of Human Health

To support risk management decisions for the former Whittaker-Bermite facility, ENVIRON prepared a screening-level HHRA on behalf of Whittaker Corporation. The objective of the Tier 1 HHRA was to characterize potential risks to human health resulting from exposure to Site-related chemicals and to develop risk based target concentrations (RBTCs) for chemicals of potential concern (COPCs) identified in soil, soil gas, and surface water. Consistent with risk assessment guidance from the California Environmental Protection Agency (Cal/EPA)[1], the assessment is referred to as a "Tier 1" or "screening-level" HHRA because it was conducted using a very conservative approach that allowed the rapid screening of areas of the Site into:

[1] Cal/EPA. 2005. *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*. January.

1) areas below risk levels of concern, and 2) areas that require more detailed risk evaluation based on area-specific factors (e.g., land use) prior to remediation design.

Conservative assumptions were used in the HHRA such that areas identified as being below risk levels of concern can confidently be assumed to not pose a significant health risk to people under the land-use scenarios evaluated. As described in the following sections, there are significant portions of the Site that are below risk levels of concern for any land use. In these areas, no risk management measures are needed before redevelopment. For areas that cannot be screened out using the Tier 1 analysis, a more detailed risk evaluation could be undertaken to determine whether risks are still above levels of concern. Should subsequent evaluations in later phases of this project identify the need for further refinement of the risk estimates, the scope of any additional risk evaluations would be discussed with the Department of Toxic Substances Control (DTSC) and supplemental analyses would be presented in appropriate supporting documents.

5.2.1 Scope and Approach of the Screening-Level HHRA

The Tier 1 HHRA presents an evaluation of human health risks associated with potential exposures to chemicals in shallow soils (up to ten feet below ground surface) and with volatile organic compounds (VOCs) present as vapors in underlying soils. Potential exposures of people to surface water in streams at the Site were also evaluated. While protection of groundwater is a specific environmental management goal identified for the Site, evaluation of the groundwater pathway was not addressed in the HHRA.

The Tier 1 HHRA for the Site was conducted using an approach in which RBTCs were compared to sampling results for risk estimation, as follows:

- Develop receptor-specific RBTCs for soil, soil gas, and surface water for all COPCs. The RBTCs are chemical-specific concentrations corresponding to a cancer risk of 1×10^{-6} or a hazard quotient of one (1). Separate sets of cancer and non-cancer RBTCs were developed for each receptor evaluated.

- Calculate the cancer risks and non-cancer hazard indices associated with the measured concentrations of chemicals at each individual sampling location. This approach is often referred to as a "point-by-point approach" and relies on the use of the maximum detected concentration at each sampling location across the Site. The risks were estimated based on the ratio of the detected Site concentrations to the RBTCs, as described in detail in the HHRA. Health risks calculated for concentrations detected at individual sampling locations do not necessarily represent the risk to anyone who may live or work at the Site, but patterns of sampling points associated with high estimated health risks indicate areas where risk management may be required.

- Plot the cancer risks and hazard indices estimated for each sampling location on Site maps to facilitate the identification of areas where risk management (e.g., remediation) may be required. The maps prepared for the Tier 1 HHRA show human health risks associated with individual sampling locations and depict cancer risks corresponding to values less than, within, and greater than the target risk range of 1×10^{-6} to 1×10^{-4}, and hazard indices corresponding to values less than or greater than one, between one and ten, and greater than ten. The Site maps depicting cancer risks and hazard indices were included as Figures 8.1 through 8.41 of the April 2007 ENVIRON report.

- Perform additional analysis for all sampling locations where the estimated cancer risks are within or greater than the target risk range and hazard indices are greater than one. Specifically, the chemicals contributing to the cancer risks or non-cancer hazard indices were presented.

5.2.2 Chemicals of Potential Concern

In parallel with the point-by-point approach used to evaluate and present the risk characterization results for the HHRA, the methodology for selecting soil and soil gas COPCs was applied to each individual sampling location within OUs 2 through 6. For organic chemicals, all detected chemicals in soil or soil gas were retained as COPCs at a given location. Metals and inorganic anions (specifically, fluoride, nitrate, and nitrite) detected at concentrations greater than Site-specific background levels were retained as soil COPCs, with those metals present at background levels and essential nutrients excluded from the evaluation at that location.

For surface water, early studies of surface water quality at the Site indicated that only perchlorate was present at elevated concentrations, with concentrations of all other analytes below reporting limits or at levels considered to be background. Based on these findings, more recent surface water studies analyzed for perchlorate only. Consistent with these findings, perchlorate was the only COPC identified for surface water.

5.2.3 Potentially Exposed Populations

Various land-use designations have been proposed for the Site, including residential, commercial, recreational, and open space. Consistent with current and proposed land uses, risks associated with potential exposures to chemicals in soil and soil gas was evaluated for the following human receptor populations:

- Sensitive-use receptor (adult/child)
- Home gardener
- Commercial/industrial worker
- Construction worker

- Recreational users

DTSC requested that a "sensitive-use receptor" be evaluated to support risk management decisions that will be made for the Site. The evaluation of the sensitive-use receptor was based on exposure factors recommended by DTSC for a resident receptor. Cal/EPA considers the residential evaluation, based on single-family homes with private yards, and including children and adults as part of the household, to be appropriate for analyzing other sensitive property uses such as hospitals and day care centers. An additional residential exposure pathway considered was consumption of homegrown produce, evaluated for the home-gardener scenario. With the exception of lead, California regulatory agencies do not typically evaluate consumption of homegrown produce in risk assessments for residential sites in urban settings, although DTSC notes that Site-specific considerations may justify an evaluation of this pathway. Because studies have shown that lettuce and other plants irrigated with water containing perchlorate can take up perchlorate into edible plant parts, DTSC requested evaluation of the homegrown produce pathway for perchlorate at this Site.

A conceptual Site model for soil and surface-water exposure pathways was developed to identify the specific exposure pathways for each receptor. The model identifies chemical sources, potentially impacted media, and the potential human exposure routes for contacting impacted media. These source-pathway-receptor relationships provide the basis for the quantitative exposure assessment and development of RBTCs.

5.2.4 Estimates of Chemical Transport

To evaluate potential transport of VOCs in soil gas, vapor transport models consistent with the Johnson and Ettinger model and assumptions recommended by DTSC were used to estimate air concentrations for the following pathways:

- Transport of volatile chemicals into buildings (commercial and residential)
- Transport of volatile chemicals into ambient air
- Transport of volatile chemicals into trenches
- Transport of volatile chemicals into recreational/park areas

In addition, airborne particulate concentrations were modeled to evaluate exposures associated with chemicals potentially present on inhaled dusts.

Estimates of chemical transport to surface water and groundwater are summarized in later portions of this section.

5.2.5 Risk Characterization Results under Current Conditions

The following discussion presents the results of the Tier 1 HHRA for the sensitive-use scenario and home-gardener scenario. The discussion is organized by medium (i.e., soil, soil gas, and surface water) and presents the risk results organized by contaminant type.

Soil

Under the sensitive-use scenario, three exposure pathways were evaluated: incidental ingestion of soil, dermal contact with soil, and inhalation of airborne particulates. Only a very small number of the over 70 COPCs identified in soil were found to be present at concentrations (even in single samples) above RBTCs. This indicates that for soil, cancer risks are below the lower end of the target risk range (i.e., less than 1×10^{-6}) and hazard indices are less than one for most areas of the Site. The soil sampling locations with COPCs present at concentrations above RBTCs were generally isolated and represented a very small fraction of the samples analyzed.

The home-gardener scenario is similar to the sensitive-use scenario in that the same standard exposure pathways were evaluated: incidental ingestion of soil, dermal contact with soil, and inhalation of airborne particulates. For these pathways, the cancer risks and noncancer hazard indices are the same as those estimated under the sensitive-use scenario. In addition, the ingestion of homegrown produce pathway was evaluated for perchlorate. In contrast to the results for the sensitive-use scenario, multiple sampling locations within spatially larger areas were found to exceed the perchlorate RBTC for the home-gardener scenario, indicating the potential for a hazard quotient greater than one (1) in areas used for growing garden produce. Perchlorate is not considered to be a carcinogen, and so potential cancer risks were not estimated for the ingestion of homegrown produce pathway.

- **Perchlorate.** The RBTC for perchlorate under the sensitive-use scenario is 28 mg/kg and the RBTC under the home-gardener scenario is 0.1 mg/kg. As discussed above, the exposure pathways considered under the sensitive-use scenario are incidental ingestion of soil, dermal contact with soil, and inhalation of airborne particulates. The home-gardener scenario includes these same pathways as well as the homegrown produce pathway. A comparison of the two RBTCs shows that the soil RBTC for the home-gardener scenario of 0.1 mg/kg is significantly less than the RBTC of 28 mg/kg for the sensitive-use scenario. Perchlorate can be taken up by garden produce, such that perchlorate intake from ingesting homegrown produce is significantly higher than intake from the other exposure pathways for soil at any given soil concentration. Accordingly, a lower RBTC under the home-gardener scenario is needed to achieve the same level of protection as under the sensitive-use scenario.

- The RBTC previously derived for OU1 is 0.5 mg/kg[2]. This RBTC, which is most directly comparable to the RBTC derived in the Tier 1 HHRA for the home-gardener, is somewhat higher than the RBTC of 0.1 mg/kg derived for OUs 2 through 6 (for this discussion, referred to as the "OU2-6 RBTC") for the home-gardener scenario. The two RBTCs were derived for the same exposure pathways, i.e., ingestion of soil, dermal contact with soil, inhalation of airborne particulates, and ingestion of homegrown produce. The OU2-6 RBTC is less than the OU1 RBTC due to a change in the toxicity value (reference dose or RfD) for perchlorate and changes in some of the modeling parameters used to derive the RBTC. The specific differences in the two derivations are as follows:

  1. The OU2-6 RBTC was derived using the "RfD equivalent" that Cal/EPA applied in the derivation of the Public Health Goal for perchlorate. The use of this value was approved by DTSC. The OU1 RBTC was derived using an older RFD from the U.S. Environmental Protection Agency (USEPA) that was accepted at that time.

  2. The OU2-6 RBTC was derived using site-specific plant uptake factors to model perchlorate uptake by homegrown produce. ENVIRON completed a plant uptake study, in which lettuce, radishes, and tomatoes were grown in perchlorate-impacted soils collected from the Site. The results of the study were used to derive Site-specific plant uptake factors that describe the ratio of perchlorate concentrations in plants to those in soils. The OU1 RBTC was based on a lower value for the plant uptake factor that had been taken from the literature, but which was not specific to the Site.

  3. Different produce ingestion rates were used to derive the OU2-6 RBTC, considering Site development plans and the differences in anticipated gardening practices between stand-alone single-family residences and multi-family apartments or condominiums that may not have access to on-grade soils for gardening.

Although perchlorate is one of the most widespread chemicals in Site soils, concentrations in shallow soils (i.e., within the 0 to 10 feet depth interval) are below the RBTC for the sensitive-use scenario at the vast majority of sampling locations. For OU2, Facility Areas with sampling locations above the sensitive-use RBTC of 28 mg/kg include one sampling location in Area 27 and five sampling locations in or near Area 34. For OU3, perchlorate concentrations are above the RBTC at two sampling locations in Area 14 (Burn Valley). The concentrations of perchlorate at these locations range from approximately 42 to 1,700 mg/kg, corresponding to estimated hazard quotients of approximately 2 to 60. Perchlorate concentrations were less than the RBTC at all sampling locations in OUs 4, 5, and 6.

[2] CDM. 2005. Remedial Action Plan, Operable Unit 1 (OU1), Former Whittaker-Bermite Facility, Santa Clarita, California. Prepared for Whittaker Corporation. February 3.

- **Polycyclic aromatic hydrocarbons (PAHs) and 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD).** PAHs were detected at concentrations greater than their RBTC at two sampling locations, one between Areas 27 and 44 in OU2, with an associated cancer risk of 3×10^{-4}, and one in OU5 with an estimated cancer risk of 3×10^{-6}. TCDD was detected at concentrations greater than the RBTC at two noncontiguous sampling locations in Area 14 (Burn Valley) in OU3. The estimated cancer risks for TCDD associated with these individual sampling locations are 1×10^{-6} and 3×10^{-6}.

- **Petroleum hydrocarbons.** Petroleum hydrocarbons were detected at concentrations greater than their RBTC at one location in Area 39 in OU2 and one location in Area 51 in OU5. The hazard indices associated with these individual sampling locations are 2 and 12, respectively.

- **Volatile organic compounds (VOCs).** Chlorinated solvents and their degradation products (tetrachloroethylene [PCE], trichloroethylene [TCE], and vinyl chloride), are the primary volatile COPCs contributing to cancer risks within or greater than the target risk range and/or hazard indices greater than one. All locations with VOC concentrations greater than soil RBTCs are present in areas where soil gas concentrations exceed the soil- gas RBTCs. Detailed discussion of these areas is provided below.

Soil Gas

Two substantial soil gas investigations have been completed at the Site, roughly in the time periods of 1995 to 1997 and 2003 to 2005. In many areas, soil gas locations sampled in 1995 to 1997 were not resampled during the 2003 to 2005 timeframe. While total VOC levels in soil gas typically decrease over time as chemicals diffuse in the subsurface and/or are released into ambient air, risks may not decrease because the relative proportion of constituents in the mixture may change due to the formation of degradation products. There did not appear to be sufficient spatial overlap in the sampling locations from the two time periods to base the risk estimates on the more recent data alone. As a conservative, screening-level approach, ENVIRON used the combined analytical data from both periods even though the older data may no longer be fully representative of current Site conditions.

Under the sensitive land-use scenario, the estimated cancer risks and hazard indices associated with soil gas concentrations are within or greater than the target risk range in many areas of the Site. Chlorinated solvents and their degradation products (primarily PCE, TCE, and vinyl chloride) are the primary contributors to the cancer risk. Most of the chlorinated solvents are carcinogens, with the RBTCs based on carcinogenic effects more stringent than the RBTCs based on noncancer effects. While the Tier 1 HHRA evaluated both, cancer and noncancer effects, the discussion below focuses on the results based on the cancer endpoint given that all areas with elevated hazard indices are located in areas with cancer risks within or above the target risk range.

- **PCE, TCE, and vinyl chloride.** Over 30 Facility Areas have been identified with concentrations of PCE, TCE, and/or vinyl chloride in soil gas at individual sampling locations associated with cancer risks greater than 1×10^{-4}. In contrast to the findings for soil, elevated soil gas concentrations were typically found in multiple adjacent samples from an investigated area. Spatially, the larger areas of contamination are within OUs 2 and 3, with smaller areas identified in OUs 4 and 5. Within OU2, the primary Facility Areas with detected soil gas concentrations associated with cancer risk levels above the target risk range are Areas 53, 54, and 72, in the eastern portion of the OU; Areas 4, 22, 37, and 63 in the central portion of the OU; and Areas 27, 28, and 36 near the central, northern boundary. In OU3, Area 14 (Burn Valley) comprises the largest area of the Site with soil gas concentrations associated with estimated cancer risks greater than 1×10^{-4}. Other locations within OU3 with cancer risks above the target risk range include Areas 17 and 30 (both contiguous with Area 14), and Area 76. Cancer risks are within or greater than the target risk range at a few isolated sampling locations within Hula Bowl Canyons I and IV in OU4. Sampling locations with cancer risks within or greater than the target risk range were also identified for several areas in OU5, including Areas 2, 20, 25, 31, 48, 49, 51, 66, and Former Buildings 502, 504, and 506.

- **Other VOCs.** Concentrations of a limited suite of other VOCs were also above RBTCs. These compounds include the carcinogens carbon tetrachloride, chloroform, and benzene, and the noncarcinogens, cis-and trans-1,2-dichloroethene and 1,1-dichloroethene. In all cases, these chemicals are co-located with the chlorinated compounds discussed previously (i.e., PCE, TCE, and vinyl chloride).

The soil-gas RBTCs used in this HHRA are based on conservative modeling and exposure assumptions and may significantly overestimate risks associated with a given area. Thus, those areas identified as being below risk levels of concern can confidently be assumed to not pose a significant health risk to people under the land-use scenarios evaluated. As previously noted, most areas of VOC contamination fall into one of two categories: areas clearly below and areas clearly above risk levels of concern, such that more detailed risk evaluations are not anticipated. That is, further refinement of soil-gas RBTCs would not change the overall conclusions regarding the need for remediation of those areas with elevated risk. However, further evaluations may be conducted in later phases of this project if the need for further refinement of the soil-gas RBTCs is identified (e.g., depth-specific RBTCs). The scope of any additional work and evaluations would be closely coordinated with DTSC. The soil-gas RBTCs are summarized in Table 7.6 of the ENVIRON April 2007 report.

Surface Water
As previously discussed under the section Chemicals of Potential Concern, perchlorate was the only COPC identified for surface water. A surface water perchlorate RBTC of 4.8 milligrams per liter (mg/L) was derived for a recreational scenario, assuming a youth could contact water in the streams at the Site under current or possible future conditions. The measured perchlorate concentrations were less than the RBTC in all samples.

5.2.6 Use of RBTCs as Remedial Goals

The soil, soil gas, and surface water RBTCs derived in the Tier 1 HHRA are identified as preliminary remediation goals for protection of human health. These RBTCs are media and chemical-specific concentrations corresponding a cancer risk of 1×10^{-6} or a hazard quotient of 1. Separate sets of RBTCs were developed for each combination of media (soil, and soil gas) and receptor (sensitive-use receptor, home gardener, commercial/industrial worker, construction worker, and recreational users) evaluated. For surface water, RBTCs were developed only for a recreational user.

The preliminary RBTCs may be revised, as appropriate, to address area-specific considerations and target risk levels based on land-use considerations. Factors that will be considered in establishing the final area-specific RBTCs for protection of human health include the following:

- The RBTC of 100 µg/kg for perchlorate derived for the Home Gardener scenario would be applied across the Site to meet the unrestricted land use goal for the upper ten feet of soil, or if a new development plan is in place, in areas with single-family residences. In areas of multi-residential units, such as apartments, townhomes, or condominiums, the sensitive-use RBTC of 28,000 µg/kg would be applied. However, the lower RBTC would be applied in developments with the potential for exposure to home-grown produce, including, for example, community gardens. Areas of perchlorate impacts known to exceed the home-gardener and sensitive-use RBTCs are shown on Figure 5-1.

- The RBTC of 200,000 µg/kg for perchlorate derived for the Construction Worker scenario would be applied in areas undergoing construction for the upper ten feet of soil. Although shown in the key for Figure 5-1, there are no known perchlorate concentrations exceeding 200,000 µg/kg in the upper ten feet of soil at the Site.

- The RBTC of 350,000 µg/kg for perchlorate derived for the Commercial Worker scenario could be applied for areas designated for commercial land use for the upper ten feet of soil. Although shown in the key for Figure 5-1, there are no known perchlorate concentrations exceeding 350,000 µg/kg in the upper ten feet of soil at the Site.

- The RBTC of 190,000 µg/kg for perchlorate derived for the Child Park Visitor scenario could be applied for areas designated for recreational land use for the upper ten feet of soil. Although shown in the key for Figure 5-1, there are no perchlorate concentrations known to exceed 190,000 µg/kg in the upper ten feet of soil at the Site.

- The RBTC of 640,000 µg/kg for perchlorate derived for the Youth Mountain Biker scenario could be applied for areas designated for open space land use for the upper ten feet of soil. Although shown in the key for Figure 5-1, there are no perchlorate concentrations known to exceed 640,000 µg/kg in the upper ten feet of soil at the Site.

- For metals, the RBTCs for the sensitive-use receptor will be applied to meet unrestricted land use conditions. For some metals, the construction-worker scenario RBTCs are less than the sensitive-use RBTCs; however, protective measures, if necessary, can be implemented during construction activities to mitigate the potential risks. Additionally, for some metals (e.g., aluminum), the construction worker RBTCs are less than the background levels established for the Site, and a cleanup goal below naturally-occurring levels would not be appropriate. In the case of arsenic, the RBTC for the unrestricted land use scenario is less than the naturally-occurring background level at the Site. Therefore, arsenic will be addressed only in the event that the analytical data clearly indicate that a release has occurred resulting in concentrations significantly higher than background levels. An initial screen will be conducted during the remedial design phase by comparing soil concentrations with the upper background limits established for this Site of 6 mg/kg. In areas where arsenic concentrations exceed these limits, a statistical evaluation will be conducted. This evaluation will include 1) identification of the appropriate exposure unit (i.e., area) for statistical evaluation, considering the proposed land use for the area, and 2) statistical testing (using two-sample hypothesis testing of central tendency and upper percentiles) to compare the analytical results for the designated area with the background data set. For arsenic, a background data set was established in the AME background study (AME 1997b).

- The soil gas RBTCs were derived based on a set of generic, but conservative assumptions and did not take into consideration area-specific factors. The approximate areas exceeding the soil-gas RBTCs for various land use scenarios for VOCs within the upper 100 feet of soil are shown in Figure 5-2. It should be noted that the soil-gas RBTCs were derived for the upper 5 feet of soil. During the preparation of the RD, vapor intrusion risk modeling will be conducted for the VOC-impacted areas using area-specific factors to evaluate potential changes in the RBTCs with increasing depth.

- The Tier 1 HHRA was conducted using a point-by-point approach in which cancer risks and hazard indices were estimated for each individual sampling location. In identifying areas for remediation, the risk estimates may be refined by identifying an appropriate exposure area (considering the identified land use) and deriving an upper confidence limit on the arithmetic mean (95UCL) for the exposure area.

- In some areas, revised RBTCs may be required for protection of human health to address cumulative risks associated with the presence of multiple COPCs.

- As discussed in Section 7, the proposed land use will be considered in identifying the remediation goals for protection of human health in any given area.

The preliminary RBTCs are intended to help guide risk management decisions regarding the need for remediation and will be considered in conjunction with the soil screening levels described in the following sections. For protection of human health, Cal/EPA generally considers an incremental risk of one in one million (1×10^{-6}) to be a point of departure for purposes of making risk management decisions, with most approved site closures for unrestricted land use achieving an incremental risk level of ten in one million (1×10^{-5}) or less and a hazard index of one or less. In some settings, a higher cancer risk level may be approved for commercial/industrial and recreational land use. For areas targeted for remediation, the final remedial goals for protection of human health will be identified using a comprehensive approach that includes consideration of land use, cumulative cancer risk and hazard indices, and the appropriate level of protection for the area to which they apply.

5.3 Perchlorate and VOC Screening Levels for Groundwater Protection

Preliminary soil and soil gas screening levels for groundwater protection were developed for perchlorate and VOCs. The screening levels were derived to support evaluation of the soil-to-groundwater transport pathway and identification of containment measures to prevent further off-Site transport of perchlorate and VOCs in groundwater at levels above health-based benchmarks. The soil (or soil gas) screening levels for groundwater protection were developed for application in OUs 2 through 6. The preliminary SSLs were developed assuming the Site remains in its current relatively natural state with no redevelopment. If the Site is redeveloped, land cover changes, surface water drainage systems, and infiltration control systems would tend to reduce the risk of soil to groundwater movement and off-Site transport of perchlorate and VOCs. Thus, revised SSLs will be needed to account for future Site conditions under the applicable approved redevelopment plan.

In addition, the OU7 groundwater remediation approach for both the Saugus aquifer and the Northern Alluvium area incorporates boundary containment as a key Remedial Action Objective for groundwater. A pilot groundwater extraction system at the downgradient Site boundary is already in operation in the Northern Alluvium area, and the work plan for a pilot remediation program for the Saugus aquifer has

been approved by DTSC and is being implemented. Groundwater extraction for on-site hydraulic containment purposes is a key element of the remedial alternatives being evaluated for the Saugus aquifer through implementation of the referenced pilot program. It is expected that the full-scale implementation of these measures will fulfill the objective of groundwater quality protection.

For perchlorate, preliminary soil screening levels for groundwater protection are based on a target concentration in groundwater at the property boundary of 6 µg/L, the California maximum contaminant level (MCL). The screening levels represent the maximum concentration of perchlorate that can be left in soils that will not cause the target groundwater concentration to be exceeded at any point along the property boundary in the future. Similarly, the preliminary soil screening levels for VOCs are based on target concentrations in groundwater at the property boundary corresponding to the MCL or a drinking water RBTC.

5.3.1 Estimates of Chemical Transport

The calculation of screening levels was based on simple models of perchlorate and VOC transport in the unsaturated and saturated zones. While there is both uncertainty and variability in transport rates, the models were designed to give very conservative estimates of perchlorate and VOC transport that likely overestimate the concentrations that will occur in groundwater for a given soil or soil gas concentration.

Conceptual models of water infiltration pathways through the vadose zone were developed for three different portions of the Site: 1) the Northern Alluvium vadose zone, 2) the area where the Saugus Formation is exposed at ground surface and forms the vadose zone (generally northeast of the San Gabriel Fault), and 3) the area where Terrace deposits overlie the Saugus Formation in the vadose zone (generally southwest of the San Gabriel Fault).

For the purpose of developing groundwater protection screening levels, the Site was divided into two areas based on typical depth to groundwater: the Northern Alluvium Area and the Saugus Area. The Northern Alluvium Area is the northern portion of OU5 in which the upper geological unit is alluvium. The remainder of the Site (except OU1) is included in the Saugus Area. The water table in the Northern Alluvium Area is typically about 40 feet below ground surface, while in the Saugus Area it is typically at depths of 350 feet or greater. In the Northern Alluvium Area, only one screening level was developed based on the assumption that the entire 40 feet vadose zone thickness is impacted by perchlorate. In the Saugus Area, separate screening levels were developed for soil in the 0 to 40 feet depth range and soil in the 40 to 200 foot depth range. An additional screening level for soil in the 0 to 20 feet depth range in the Saugus Area was developed assuming that the perchlorate-impacted soil only extends to a depth of 20 feet.

Transport in the vadose zone was simulated using the 3DADE model developed by the U.S. Soil Salinity Laboratory. Groundwater transport was simulated using MODFLOW and MT3D, which were developed by the U.S. Geological Survey. These models were coupled in order to provide estimates of the maximum groundwater concentration at the property boundary for a given initial soil concentration in a 0.5 acre source zone. The property boundary was assumed to be 150 feet laterally from the source area for the Northern Alluvium scenario, 2,000 feet from the source area for the two shallow soil Saugus Area scenarios, and 3,000 feet from the source area for the deep soil Saugus Area scenario. These distances were selected as representative distances to the property boundary from impacted soil areas in the Northern Alluvium and Saugus Areas identified in the Site-Wide RI.

5.3.2 Use of Groundwater Protection SSLs as Remedial Goals

The preliminary soil and soil gas screening levels for perchlorate and VOCs for groundwater protection are presented in Tables 8a and 8b of Appendix E of the April 2007 ENVIRON report. Revised SSLs will be evaluated along with the other applicable RBTCs to develop the appropriate remedial goals for each area of the Site. Unless and until pilot testing proves otherwise, remediation of the deeper soils overlying the Saugus aquifer will not be technically and/or practically feasible, and the protection of the Saugus aquifer will be addressed through the operation of the western boundary groundwater containment system. Therefore, for the purposes of this RAP, only the Northern Alluvium SSL (along with surface water SSL discussed in the next section) will be used as a remedial goal. If the results of the pilot testing indicate that remediation of the deeper soils is technically and economically viable, then appropriate performance based remedial goals will be evaluated for use for the deeper soils. Areas of perchlorate and VOC impacts exceeding the Surface Water and Northern Alluvium preliminary SSLs are shown on Figures 5-1 and 5-2.

5.4 Perchlorate Screening Levels for Surface Water Protection

Soil screening levels for surface soil in the vicinity of Site drainages were developed to protect surface water quality based on a target concentration in surface water of 6 micrograms per liter (µg/L), the California MCL for perchlorate. Since perchlorate is highly soluble and does not adsorb significantly to soil, when precipitation falls on surface soils at a rate high enough to generate surface water run-off, perchlorate present in the surface soil will be easily dissolved and transported in the run-off water. In principle, any soil in the Site drainages with perchlorate above the detection limit of 20 µg/kg could potentially cause the surface water run-off in contact with the soil to have perchlorate concentrations above the surface water target of 6 µg/L. Therefore, the soil screening level to protect surface water quality is set to the detection limit of 20 µg/kg for surface soils within and adjacent to Site drainages. This is the same screening level presented in the Draft Surface Water Mitigation Feasibility

Study developed previously by ENVIRON[3] and the OU1 Remedial Action Plan developed by CDM[4].

A more detailed analysis of dilution in the drainages and intermittent streams on the Site may be performed in the future in order to refine the soil screening level. This analysis would require information about the future planned topography of the Site after development, planned ground surface cover, and artificial drainage systems planned as part of Site development. The resulting refined soil screening levels would likely be higher than 20 µg/kg as a result of the additional surface protection and surface water management provided as a result of Site development and would vary in different drainages across the Site.

5.5 Perchlorate Screening Levels for Protection of Ecological Receptors

ENVIRON developed soil and surface water screening levels for perchlorate for protection of ecological receptors (plant and animal species). Although limited, the state of scientific knowledge on the toxic effects of perchlorate to ecological receptors is expanding rapidly as new studies become available. ENVIRON reviewed studies previously evaluated by the USEPA and more recent studies released subsequent to the USEPA review to develop the perchlorate screening levels. These screening levels would be appropriate only for areas of the Site that remain undeveloped and that would provide suitable habitat for ecological receptors.

The many different types of plants and animals that are found at the Site complicate the development of cleanup numbers for ecological receptors. To address this issue, the ecological assessment identifies "the most sensitive species." ENVIRON identified the most sensitive ecological species for soil as the California vole and the California quail. These receptors were selected based on the findings of the ecological risk assessment previously prepared by Knight Piésold for OU1E[5]. The screening levels developed for these species are 0.094 mg/kg for the California vole and 8.1 mg/kg for the California quail. These screening levels were derived using the same methodology as used in the ecological risk assessment for Operable Unit 1E; that methodology has been reviewed and approved by the DTSC.

ENVIRON also developed a screening level for protection of ecological receptors exposed to surface water in streams. ENVIRON identified the green frog as the most sensitive species and developed a cleanup value protective of short-term (acute) exposures. Water flow in streams at the Site is intermittent so that a cleanup level protective for short-term exposures is considered to be the most relevant.

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[3] ENVIRON. 2004. Draft Feasibility Study for Mitigation of Perchlorate in Surface Water Run-Off, Former Whittaker Bermite Facility, Santa Clarita, California. December 3.
[4] CDM. 2005. Remedial Action Plan, Operable Unit 1 (OU1), Former Whittaker-Bermite Facility, Santa Clarita, California. Prepared for Whittaker Corporation. February 3.
[5] Knight Piésold and Co. 2003. *Former Whittaker-Bermite Facility Remedial Investigation Report and Baseline Risk Assessment for OU1E.* February 28.

The screening level for protection of aquatic species is 24 g/L, a level significantly higher than the Public Health Goal of 6 µg/L.

The soil screening levels for ecological receptors are very conservative and will be used only for an initial ecological screening of the Site. If perchlorate concentrations in an area are less than the relevant screening level, no further evaluation is warranted. However, if perchlorate concentrations are greater than the screening level, then a more detailed ecological risk assessment may be warranted for that area. That is, an exceedance of the ecological screening levels does not necessarily trigger the need for remediation. Any areas requiring more detailed evaluation will be closely coordinated with DTSC.

As previously discussed with DTSC, it would be inefficient to develop screening levels for other COPCs at the Site at this time. In contrast to perchlorate, which is present in surface and near-surface soils (within the zero to five foot depth interval) in many areas of the Site, many of the other COPCs are present only in localized areas. Future development of the property is expected to include residential and commercial development and supporting infrastructure over much of the Site. Exposure of ecological receptors is not likely to occur in these areas simply due to lack of suitable habitat. Thus, many existing ecological areas which currently exceed screening levels would likely be either remediated or eliminated as a result of being in future development areas. Further, area use factors for the representative ecological receptors would vary greatly depending on the available habitat following development. Area use factors (and thus, exposure to COPCs) would be much larger if it were assumed that the Site were to remain undeveloped than if much of the Site were developed for residential and commercial use, reducing the area of suitable habitat for ecological species. Soil screening levels estimated assuming that the Site is developed would likely differ from those that would be estimated assuming the Site remains undeveloped.

The proposed approach for addressing potential ecological risks is to first screen COPCs based on spatial co-occurrence with areas that remain undeveloped. Screening levels will be developed for COPCs identified in these areas. Similar to the approach described for perchlorate, if COPC concentrations in an area are less than their screening level, no further evaluation is warranted. However, if concentrations are greater than the screening levels, then a more detailed ecological risk assessment may be warranted. This approach would be applied using the Geographic Information System (GIS) developed for the Site. The approach would include consideration of the spatial data on chemical impact and habitat at the Site and the Site development plan, in conjunction with approaches for estimating spatially-explicit exposure, such as Spatially-Explicit Exposure Model (SEEM) or RiskTrace™ software.

5.6 Summary

The preliminary soil RBTCs and SSLs were developed to address the multiple objectives that must be taken into account when making environmental management decisions for the Site. These objectives include protection of human health and the environment, with SSLs derived for protection of groundwater, surface water, and ecological receptors. For protection of human health, RBTCs were derived corresponding to the proposed future land-uses of the Site, including residential, commercial/industrial, recreational, and open-space areas.

Although a large number of chemicals were detected in soil samples, the results of the HHRA indicate that perchlorate is the major contributor to risks associated with potential exposures to soil. Perchlorate in soil is also the primary chemical of concern for protection of groundwater, surface water, and ecological receptors. For soil gas, the primary chemicals of concern are chlorinated solvents, with tetrachloroethene, trichloroethene, and vinyl chloride the main contributors to risks to human health. These chemicals are also of concern with respect to protection of groundwater.

Table 5-1 lists the preliminary RBTCs and SSLs derived for these primary chemicals of concern. The table identifies the derivation basis for each RBTC and SSL and the specific areas in which the RBTC (or SSL) would be applied. To use these screening levels in support of risk management decisions, screening levels applicable to a given area (taking into account likely future land use) would be selected as the basis for identifying a remedy.

For VOCs, areas with concentrations exceeding the revised SSLs or with cumulative cancer risks greater than 1×10^{-5} will be evaluated for remediation and/or risk management decisions and possible further evaluation. As discussed in this section, the RBTCs and SSLs will be refined in support of the risk management decisions. For areas identified for remediation, the relevant RBTCs and SSLs may serve as the preliminary remediation goals. This approach is discussed further in Section 7.

The SVE remedial actions will be implemented with the intent to reduce VOC concentrations below the remediation goals within the source areas. However, if residual VOC concentrations remain in excess of remediation goals once VOC reductions have reached asymptotic conditions, then the active remediation operations will be considered complete and engineered controls and/or land use restrictions may be implemented. Approximate areas of VOC impacts exceeding the RBTCs and SSLs are shown on Figure 5-2.

Detailed information on the derivation of the RBTCs and SSLs was presented in the ENVIRON report titled "*Derivation of Soil Screening Levels for the Protection of Human Health and the Environment*", which also includes RBTCs and SSLs for all COPCs identified for soil and soil gas and the corresponding risk management objectives. This document was reviewed and commented and subsequently finalized per DTSC's request.

Section 6
Summary and Evaluation of Remedial Alternatives

6.1 Remedial Alternatives Considered and Retained

As presented within the Site-Wide FS, several technologies were identified as potentially applicable to remediation of shallow soil at the Site (CDM, 2007). These technologies were combined into various remedial action alternatives that are expected to achieve varying degrees of Site cleanup at commensurately different costs. All alternatives presented below include the assumption that on-site groundwater containment will be conducted as part of the OU7 remedy and comprehensive Site remediation strategy. A work plan to install a pilot remediation well network for the Saugus aquifer has been reviewed and approved by DTSC. For the purpose of this RAP it is assumed that once a full-scale remediation well network plan has been implemented adequate groundwater containment will be achieved. It is also assumed that such groundwater containment measures will be identical for each alternative discussed below. As stated previously, the on-site groundwater containment activities will be conducted to prevent/limit off-site transport of chemicals from the Site. The context of the groundwater containment activities is significant for the comprehensive Site remediation strategy in that regardless of the degree of success of on-site source removal measures, mitigation and protection of groundwater resources will be achieved.

A comprehensive Site remediation strategy should also address the chemical impact to deep soils at certain areas of the Site. As stated above, a number of innovative technologies have been considered, including gaseous and liquid injection of amendments to promote in-situ biodegradation of chemicals in deep soils. These technologies will be tried on pilot scale in certain target areas to evaluate their success or failure under the actual Site conditions.

Ideally, this draft RAP would be prepared after implementation of the referenced pilot studies; however, to meet the overall schedule of the Site remediation as specified in the Order, the planning for and implementation of pilot study of the deep soil remediation will be performed on a parallel track with this RAP.

6.1.1 Alternative No. 1: No Action

Under the no action alternative, no active remedial efforts would be made to address the areas of concern in OU2 through OU6 and the contaminants of concern would be allowed to attenuate by natural processes such as dispersion and decay. Since this alternative will not be protective of human health and the environment, it is not considered a good candidate for implementation. The no action alternative, however, was included in the detailed evaluation process consistent with state and federal guidelines.

6.1.2 Alternative No. 2: SVE, Excavation, and Off-Site Disposal

SVE is a conventional treatment technology used for treating unsaturated soil contaminated with VOCs. It is not applicable to perchlorate remediation and, in general, is only applicable for VOC-impacted soils with moderate to high permeability including sands, gravels, and silty or clayey sands and gravels. Vapor extraction wells are installed typically in grid fashion to cover the impacted area in both the vertical and horizontal planes. Well spacing is based on soil type and/or pilot testing. The process works as follows: Vacuum pumps or blowers induce airflow through the soil matrix. The forced air strips the volatile compounds from the soil and draws contaminated vapors and moisture entrained in the soil-gas to a vapor-liquid separator. Separated water is pumped from the separator and routed to water-phase treatment unit processes. Typical water-phase treatment consists of aqueous phase carbon filtration or air stripping. The contaminated vapors are routed to vapor-phase-treatment unit process such as a vapor-phase carbon filtration or thermal oxidation. The air emissions and wastewater discharges are subject to SCAQMD and NPDES permit requirements, respectively, that include procedures and protocols for monitoring system performance and discharges. SVE operations typically continue until the processes monitoring results indicate that the point of diminishing returns has been reached. Verification soil gas and soil matrix samples are typically collected from appropriately placed borings to evaluate system performance.

For Alternative 2, SVE would be applied to address the soils within the 0 to 100 feet depth range for protection of human health through the vapor intrusion pathway. However, should the results of Site-specific risk evaluations conducted during the preparation of the RD determine that remedial efforts can be applied to a lesser depth and still be protective of human health, then the proposed depths of SVE operations will be adjusted accordingly. The potential application of SVE to greater depths in order to address SSLs is dependent upon successful pilot testing of SVE within the Saugus formation bedrock that is typically present at depth. The work plan for a pilot SVE program has been approved by DTSC and is being implemented.

Following the application of SVE to address the VOC impacts, soil impacted by other COPCs (e.g. perchlorate, metals, etc.) in the target remediation areas would be excavated and transported off site via truck for disposal at a licensed landfill with all associated loading taking place within the Site boundaries. The excavation process would include verification sampling of the sides and bottoms of the excavated areas to assure that soils meet the cleanup criteria. The excavated areas would be backfilled using certified-clean fill taken from other areas of the Site.

Under SCAQMD Rule 1166, excavation work is restricted if the emissions at the face of the excavation rise above certain threshold levels. Accordingly, under Alternative 2, SVE is considered a pre-treatment component of the excavation process for areas containing VOCs. If after initial treatment by SVE, the excavated soils still contains VOCs that will potentially off gas during the excavation and loading process,

the excavation is subject to additional SCAQMD Rule 1166 provisions that require that measures be taken during the excavation, screening, stockpiling, loading, and transporting to minimize off gassing. Such measures typically include: 1) continuous emissions monitoring during excavation, 2) the use of water trucks to keep the soils damp during excavation and loading, 3) immediately covering stockpiles with plastic sheeting, 4) immediately covering loaded soils with secured tarps, and 5) prohibiting work during periods of high winds. If the soils are to be screened, engineered emission control systems may be needed including the use of temporary structures with controlled/treated ventilation systems.

Only Class I or Class II landfills with liner systems are considered acceptable for soils containing perchlorate and HVOCs. Wastes must be profiled/analyzed for landfill acceptance either before or after they are excavated/stockpiled according to protocols established by the landfill permits.

In-situ bioremediation has not been tested at the Site to date and thus the design concepts presented will require validation through pilot testing. However, if pilot testing performed on deep soils results in successful treatment of perchlorate, and application is technically and economically viable, then in situ bioremediation will be further evaluated for potential implementation where applicable. For Alternative 2, in-situ bioremediation of perchlorate-impacted soil would be potentially applied for the impacted soils remaining after excavation.

6.1.3 Alternative No. 3: SVE, Ex-Situ Bioremediation, and Ex-Situ SVE or Chemical Oxidation

For Alternative No. 3, VOC impacted soils within the 0 to 100 feet depth range (or adjusted depth based on site-specific risk evaluations) would be addressed as previously discussed for Alternative 2. Following the application of SVE to address the VOC impacts, the perchlorate-impacted soils would be excavated and treated on Site via anaerobic bioremediation to allow for reuse rather than off-site disposal. Specific depths of excavation of impacted areas will be determined in the future remedial design document and will be considered within the context of the overall Site remediation strategy and Site development plans.

If the VOC concentrations of the excavated soils exceed SCAQMD thresholds, then an ex-situ SVE pre-treatment step would be implemented on stockpiled soils to bring VOC emissions down prior to bioremediation processing. This step alleviates potential problematic permitting and operational issues for the bioremediation process equipment.

Ex-situ soil bioremediation is a form of composting that has most commonly been used in the farming, livestock, and food-processing industries to handle bulky organic wastes. It is also finding application in municipal solid waste disposal/recycling systems. For these industrial and municipal applications it is typically conducted in enclosed systems such as engineered treatment cells, vertical digesters, or rotating

drum digesters and sometimes incorporates the generation and recovery of methane gas. The process involves the biological degradation or transformation of organic or inorganic compounds in the presence and/or absence of oxygen.

In a conventional aerobic composting system, oxygen is used by microorganisms for the oxidation of organic or inorganic compounds and is called an electron acceptor. The organic or inorganic compounds that are oxidized are called electron donors or substrates. In the absence of molecular oxygen, anaerobic bacteria use alternative electron acceptors such as nitrate and sulfate. Some COPCs at the Site, including perchlorate, TCE, and PCE, are also capable of acting as alternative electron acceptors and thus are amenable to treatment via anaerobic bioremediation.

Anaerobic composting will involve addition of water and amendments via pug mill and will require the screening of excavated soils to remove rocks/objects greater than two inches in diameter. Rocks greater than two inches would be crushed and then reintroduced into the soils for treatment. Alternatively, the rocks would be treated in a lined basin or tank containing water plus electron donor and nutrients, to promote leaching and anaerobic bioremediation. The raw soils, containing approximately five to ten percent by weight moisture or less are fed into the pug mill and combined with electron donor solution, nutrients, and optional perchlorate-reducing bacteria to achieve about 10 to 15 percent by weight moisture, which is very close to the field capacity and creates a damp mud containing the electron donor. The soil is then allowed to cure while anaerobic biodegradation of perchlorate occurs. As implemented for the OU1 soil remediation operations, soil is stored in one of two ways for the curing process as described below:

- Option A - amended soil is placed in concrete containment cells and covered with plastic sheeting. The concrete containment cells would be constructed on an asphalt pad with adequate containment and stormwater collection measures. Following perchlorate destruction and confirmation sampling, soil is removed from the containment cells and used as fill on site.

- Option B – amended soil is placed into patented elongated flexible plastic bags (EcoPOD® by Ag-Bag Environmental) with a typical soil storage capacity of approximately of 400 tons or 300 cubic yards. Following perchlorate destruction and confirmation sampling, soil is removed from the bags and used as fill on site.

This treatment method was successfully applied for the treatment of perchlorate-impacted soils in OU1. The process was refined during the OU1 soil remediation operation to fit the soil and other site-specific conditions. Based on the successful soil remediation operations for OU1, the concrete containment cell approach was demonstrated to be vastly superior to the Ag Bag approach from an operational and cost efficiency standpoint. The containment cell approach was selected as the preferred method, although the Ag Bag approach was maintained as a potential alternative or contingent approach.

In all cases, to allow for efficient front-end processing in cleaning up the impacted areas, the soil treatment plant would need to be set up for stockpiling contaminated soil on a fairly large-scale. This is due to the fact that it is grossly inefficient to excavate the source areas in piecemeal fashion. The plant site would be constructed over compacted sub grade or impermeable liner (grade sloping towards a sump) with curbing around the perimeter. The ex-situ composting operation will further require the construction of an engineered treatment-cell area where the inoculated waste can be cured.

Based on the success of the remedial efforts conducted in OU1, Alternative 3 is considered applicable to all shallow perchlorate-impacted soils present in OU2 through OU6. Preliminary testing has also demonstrated that bioremediation in combination with chemical oxidation can be used to treat soil containing both perchlorate and VOCs. Ex-situ chemical oxidation, using the same process equipment as the ex-situ bioremediation, could be used as a final VOC polishing step if residual VOC concentrations exceeding RBTCs and/or SSLs are present in the soil after the bioremediation step.

Similar to Alternative No. 2, in-situ bioremediation has not been tested at the Site to date and thus the design concepts presented will require validation through pilot testing. However, if pilot testing performed on deep soils results in successful treatment of perchlorate, and application is technically and economically viable, then in situ bioremediation will be further evaluated for potential implementation where applicable. For Alternative 3, in-situ bioremediation of perchlorate-impacted soil would be potentially applied for the impacted soils remaining after excavation.

6.2 Other Alternatives

During the initial screening process, the following source area remedial options were considered and rejected because of obvious technical impracticability with respect to shallow soil: in-situ thermal technologies; in-situ chemical oxidation; phytoremediation, and stabilization/solidification. In addition, some of the following technologies were considered and were found potentially applicable for protection of soil and groundwater quality under certain conditions and in conjunction with other remedial measures:

6.2.1 Capping

Capping involves the construction of an impermeable layer over the contaminated soil that serves to isolate the impacted areas thereby eliminating or mitigating some key transport pathways including: dermal contact; airborne particulate emissions (dust); upward vapor phase movement of volatile components; and downward or lateral movement of dissolved-phase COPCs via infiltration. Capping is typically conducted in conjunction with institutional controls and is most often used in the closure of municipal or industrial landfills. Since this RAP is restricted to impacted soils that are reasonably accessible to excavation in areas that could be slated for redevelopment, this remedial option is not considered to be well suited as a sole

practice for addressing shallow soil in OU2 through OU6. Placement of large amounts of fill over the areas with known deep soil impact during future Site development could provide a form of a "cap" for providing additional level of protection for human health, surface water, and ecological receptors. However, the fill material by itself would not likely provide adequate reduction of groundwater recharge through infiltration. Nonetheless, addition of other engineering measures, including proper diversion of storm water, restricting landscaping and irrigation to drought tolerant species, and placing large paved areas over deep soil impact areas could have a significant beneficial effect on groundwater protection. For these reasons, capping for soil was not retained as a standalone remedy, but surface water management/infiltration controls could be implemented as a component of the remediation strategy within the context of the groundwater remedy and in connection with future Site management and development planning where specific measures can be planned and implemented as part of the comprehensive strategy to eliminate and/or reduce recharge and infiltration at some areas.

6.2.2 Institutional Controls

Institutional controls typically involve the use of deed covenants that place restrictions on land use or restrict access. For example, deed covenants could limit the use of impacted areas to open space or industrial development, significantly influencing risk-based cleanup goals. Deed restrictions could also be used to establish building construction standards such as requiring slab venting systems to mitigate risks associated with the vapor intrusion pathway. In cases where it is not technically or economically feasible to remediate to risk-based soil cleanup goals, institutional land use controls are often the only viable option. While they do not actively reduce source area concentrations, they do serve to prevent unacceptable exposure to human or environmental receptors. Due to the uncertainty regarding planned future development, institutional controls were not considered a viable alternative for the remedy at this time. However, in the event that new redevelopment plans are finalized prior to the initiation of cleanup activities, such controls could become viable. This would be in conjunction with future Site management and development planning where specific measures can be planned and implemented. For example, areas that are zoned for commercial use could be deed restricted to disallow use for residential purposes.

6.2.3 Monitored Natural Attenuation

Monitored natural attenuation (MNA) is typically applied for groundwater after source removal and/or active remediation operations have ceased. MNA is not typically discussed with regard to soil, but may be relevant in the case of perchlorate. Perchlorate transport within the soil is dependent upon adequate water infiltration through the vadose zone to mobilize the perchlorate downward to the groundwater. The Site operations that were the driving force behind the perchlorate impacts to the soil and ultimately the groundwater have long since ceased. MNA for soil was not retained for the soil remedy, but could be re-evaluated as a future strategy within the context of the groundwater remedy and in connection with future Site management

and development planning where specific measures can be planned and implemented as part of the global strategy to eliminate and/or reduce recharge and infiltration at some areas.

6.2.4 Soil Washing

Based on a number of pilot studies that were performed at the Site and as part of the OU1 Feasibility Studies, soil washing was found to be partially successful; however, soil washing in the scale necessary for the Site soils requires very large volumes of water to achieve required treatment goals for perchlorate. Because of the challenges and constraints of handling large volumes of wash water, and due to success of anaerobic bioremediation in OU1, soil washing was eliminated from further consideration at the Site.

6.2.5 In-Situ Bioremediation Using Liquid Amendments

In situ bioremediation using liquid amendments was eliminated for consideration during the FS for use on a large-scale basis, due to issues associated with the depth of the vadose zone and concerns regarding mobilization of contaminants through flushing. However, in some areas of the Site where the depth to groundwater is relatively shallow (i.e. OU5 proximal to the northern alluvium), the technology may prove to be advantageous.

6.3 Selected Remedial Action Alternative

On the basis of the selection criteria summarized in the Site-Wide FS, the preferred alternative for remediation of OU2 through OU6 soils is Alternative 3, which comprises combination of in-situ SVE, shallow remedial excavation, off-site disposal of soil that is not amenable to ex-situ treatment, ex-situ SVE treatment of excavated soils that still contain elevated VOC concentrations, and ex-situ biological treatment of perchlorate-impacted soils. Additionally, as discussed previously, in-situ bioremediation has not been tested at the Site to date and thus the design concepts presented will require validation through pilot testing. However, if pilot testing performed on deep soils results in successful treatment of perchlorate, and application is technically and economically viable, then in-situ bioremediation will be further evaluated for potential implementation where applicable. For the selected alternative, in-situ bioremediation of perchlorate-impacted soil would be potentially applied for the impacted soils remaining after excavation. Furthermore, it is anticipated that surface water management/infiltration controls will be implemented as part of any future Site redevelopment activities. Also, many of the potential source areas at the Site may receive substantial amounts of fill materials during the Site redevelopment grading activities, which will have a positive effect of reducing the exposure pathways and potential risk and provide an additional degree of groundwater protection. These measures along with the Northern Alluvium and Saugus aquifer groundwater containment systems will address the remedial objectives for protection of groundwater.

6.4 Munitions and Explosives of Concern

As discussed in Section 4.3 certain areas of the Site, which were historically utilized for production and testing of munitions as well as disposal, have been identified and are being investigated for potential presence of UXO/MEC items.

In accordance with the existing work plans, those areas identified with potential presence of UXO/MEC will be investigated and assessed through appropriate field screening and response techniques such as:

- Surface screening by hand held metal detecting instruments
- Clearance of vegetation and debris
- Surface soil scraping
- Anomaly response by geophysical survey
- Excavation of target anomalies
- Sifting/ separation of metallic debris from excavated soils
- Munitions debris disposal

Based on the finding of the UXO/MEC assessment, materials identified for containing MEC will be excavated, screened and removed concurrent with remediation of the chemical impact to soils within the landfill, where present. The remediation of soils with possible presence of UXO/MEC can be accomplished under the selected remedial alternative for chemically impacted soils. This coordinated approach allows sorting, removal, and appropriate management of any MEC items that may be present in the landfills.

A work plan and a work plan addendum to evaluate the potential presence of UXO/MEC items in certain areas of the Site that were identified through review of the historic operations and document have been prepared and submitted to DTSC (EODT, 2005, 2006, and 2009). Pending the results of the ongoing Site evaluations for UXO/MEC, the screening plant configuration and quality control procedures to detect and remove UXO/MEC will be provided to DTSC for review.

Section 7
Proposed Remedy

This section summarizes how the selected remedy would be applied to the various source areas at the Site. As discussed in Section 6, the selected remedial action alternative includes a combination of approaches and technologies to address the varied contamination at the Site that includes in-situ SVE, shallow remedial excavation, off-site disposal of soil that is not amenable to ex-situ treatment (metals, SVOCs, etc.), ex-situ SVE treatment of excavated soils that contain elevated VOC concentrations, ex-situ biological treatment of perchlorate-impacted soils, and in-situ biological treatment of perchlorate-impacted soils (pending successful field pilot testing). Figures 7-1 and 7-2 illustrate how the impacts and exposure and transport pathways are mitigated by the proposed remedy on the Site conceptual models.

The proposed remedy is a risk-based approach that is designed to address impacts to human health and the environment by targeting those areas that exceed the preliminary remedial goals established for the Site. Additionally, as discussed previously, some areas of the Site may not be suitable for unrestricted land use even after application of the remedy. These include portions of Areas 1, 1A-South, 4, 19, 27, 53/54/72, and 63 (OU2), Area 14 and 30 (OU3), Hula Bowl Canyon I (OU4), and Areas 2, 31/45, 33, and 48/49 (OU5), and are shown in Figure 7-3. The basis for this assumption is that even if the remedial efforts successfully reduce the current VOC concentrations by 90 percent, the residual VOC concentrations would likely exceed the levels considered safe for unrestricted land use. These areas may require post-remediation engineering and/or institutional controls and may only be suitable for commercial land use, recreational land use, or for open space.

Therefore, the remedial approach includes the contingency to apply institutional and/or engineering controls in the event that unrestricted land use levels are not technically and/or practically feasible. A matrix showing which of the preliminary remedial goals are exceeded by area under various potential land use scenarios is presented in Table 7-1.

Prior to implementation of the approved remedy, a soil management plan will be prepared as part the RD document to describe the management of excavated soil during Site development, including protocols to ensure that soil placed in a given area will meet the risk-based goals established for the specific land use in that area.

The remedial process will essentially be identical to the OU1 operations that were recently completed successfully and the infrastructure already in place at Treatment Pad Nos. 1, 2, and 3 could be utilized for part or all of the OU2-OU6 remediation operations, depending on the haul distances and routes involved.

The achievement of remedial goals will be confirmed through sampling and analysis and a post-remediation risk assessment will be prepared to demonstrate that residual

concentrations of chemicals do not pose an unacceptable risk to human health or the environment

The SVE operations are also anticipated to be similar to the OU1 operations in that multiple mobile SVE units are envisioned for the Site that could be moved from area to area as necessary. As previously discussed in Section 5, we recognize that for protection of human health, Cal/EPA generally considers an incremental risk of one in one million (1×10^{-6}) to be a point of departure for purposes of making risk management decisions, with most approved site closures for unrestricted land use achieving an incremental risk level of ten in one million (1×10^{-5}) or less and a hazard index of one or less, and that in some settings, a higher cancer risk level may be approved for commercial/industrial and recreational land use. Areas with VOC concentrations exceeding the refined, area-specific SSLs (as discussed in Section 5) or with cumulative cancer risks between 1×10^{-6} and 1×10^{-5}, or higher for the vapor intrusion pathway for the relevant land use may require remediation or may be identified for risk management decisions and possible further evaluation. While for the primary VOCs at the Site the RBTCs for the cancer endpoint are more stringent than those for the noncancer endpoint, in identifying areas for remediation and applicable cleanup goals, it will be confirmed that in achieving acceptable cancer risk levels, cumulative noncancer hazards are also addressed.

Components of the evaluation could include collection of additional soil vapor data and/or installation of permanent or semi-permanent vapor probes to monitor vapor concentrations over time. It is anticipated that only those areas with residual VOC concentrations significantly higher than the RBTCs (i.e., greater than one order of magnitude or for which cumulative risks are greater than goals established for the given land use) will be initially targeted for active in situ soil remediation. Areas with lower residual impacts will be addressed in different ways. Some of the soils with lower relative impacts (with cumulative cancer risk less between 1×10^{-6} and 1×10^{-5}) will likely be moved during redevelopment activities. Some of these soils may also be excavated concurrently to address other COPCs. These excavated VOC-impacted soils would be treated using ex-situ SVE and the residual VOC impacts left in place (if any) would be re-evaluated based on the endpoint land use and depth of residual impacts. For areas identified for remediation, the lesser of the relevant RBTCs or refined SSLs would serve as the preliminary remediation goals.

The SVE remedial actions will be implemented with the intent to reduce VOC concentrations below the remediation goals within the source areas. However, if residual VOC concentrations remain in excess of remediation goals once VOC reductions have reached asymptotic conditions, then the active remediation operations will be considered complete, and institutional and/or engineered controls may be implemented.

Additionally, there are several landfill areas that have been identified at the Site. Potential presence of unexploded ordnance (UXO) and munitions and explosives of concern (MEC) in some landfill areas requires additional level of attention to these

landfills. Pending screening of the areas with identified landfill debris for UXO and MEC, these areas may require excavation. The debris will be separated from the soils and disposed of off-site at an appropriate permitted facility, and the remaining sifted soils would be profiled and addressed along with other soils at the Site, depending on COPC concentrations.

For landfill areas not containing significant amounts of identified refuse and debris, it is expected that these soils would be treated as other areas of the Site, depending on detected COPC concentrations. Furthermore, some landfill areas do not have identified chemical impacts and may not require any remedial action.

7.1 Description of Proposed Remedy

A general discussion of the specific areas at the Site, exceedances of the preliminary RBTCs and/or SSLs, and the anticipated remedial measures is presented in the following sections. A matrix summarizing the proposed remedial approach for VOCs and perchlorate for the various areas of the Site is presented as Table 7-2.

7.1.1 OU1 Areas

VOCs

The VOC-impacted areas with OU1 (Area 7, Area 43, Area 55, and Building 329) have been or are being addressed as part of the ongoing remediation operations in OU1 and it is not expected that there will be any remaining VOC impacts requiring further remedial measures.

Perchlorate

The shallow perchlorate-impacted soils within OU1 have been excavated and treated via ex-situ bioremediation. However, elevated perchlorate concentrations in excess of the SSLs remain in the deeper soils that were beyond the reach of the OU1 remediation operations. These deeper perchlorate impacts may be addressed via in-situ bioremediation, if it can be concluded from the planned pilot testing that the innovative in-situ approaches are technically and economically viable.

7.1.2 OU2 Areas

There are twenty one areas within OU2 that exceed applicable RBTCs and/or SSLs (Area 1 [OU6], 1A-North, 1A-South, 4, 4/37, 6, 19, 22, 25, 27, 28, 34, 36, 37, 39, 53/54/72, 56, 56/58, 58, 63, and 74. Area 1 (OU6) will be discussed in Section 7.1.6. The remaining areas in OU2 either do not contain any chemical impacts or contain minor chemical impacts that don't exceed RBTCs or SSLs, and are already suitable for unrestricted land use.

VOCs

VOC concentrations exceed the sensitive-use RBTCs in Areas 1A-North, 1A-South, 4, 6, 19, 22, 27, 28, 34, 36, 37, 56, 56/58, 58, 53/54/72, and 63. VOC concentrations do not exceed the Saugus aquifer SSLs.

SVE operations are currently planned for Areas 1A-South, 4, 6, 19, 27, 34, 53/54/72, and 63. The initial phase of pilot studies for SVE operations at Areas 4, 27 and 53/54/72 have been completed and the data are being evaluated. The pilot study data will be used to evaluate the scope of the full-scale remedial operations. As discussed previously, the goal of the SVE operations will be to reduce VOC concentrations to unrestricted land use levels However, the completion of the remedial measures will be performance based (i.e., once the VOC reductions have reached asymptotic conditions, then the SVE operations will be considered complete) In the event that the residual VOC concentrations exceed unrestricted land use levels after the SVE system has reached asymptotic conditions, then institutional and/or engineering controls will be implemented to address the residual risk. The depths to which SVE will be applied, which are based on the interpreted extent of VOC impacts exceeding the RBTCs and vapor intrusion guidance, are limited to depths within the upper 100 feet of soil. However, in Areas 4, and 53/54/72, where the VOC impacts extend beyond 100 feet and the proposed surface elevations specified by the Porta Bella Plan are lower than the existing surface elevation (i.e. future cut areas), evaluation of the vapor intrusion risks will extend to appropriate depths beyond 100 feet. Pending the outcome of those evaluations, the remedial efforts may also need to extend beyond 100 feet in order to meet the remedial objectives.

The VOC concentrations in the remaining areas are generally low (slightly above RBTCs) and implementation of SVE systems would be impractical. For the majority of these areas, which include 1A-North, 22, 28, 56, 56/58, and 58, soil excavations are currently planned to address perchlorate impacts that would also remove some of the VOC-impacted soils. These excavated soils would be initially treated via ex situ SVE to address the VOCs, prior to ex situ bioremediation to address the perchlorate The residual VOC concentrations left in place would then be re-evaluated to assess whether any significant health risks remain that could require further action For Area. For Area 36, which does not have co-mingled VOC and perchlorate impacts, the approach would be to re-evaluate the residual VOC impacts if future redevelopment plans indicate residential or commercial land use in this area.

The estimated depths, volumes, and mass of VOC impacts to be addressed for these areas are summarized in Table 7-3.

Perchlorate

Perchlorate concentrations exceed the home-gardener scenario RBTC for unrestricted land use in Areas 1A-North, 1A-South, 4/22, 4/37, 6, 19, 25, 27, 28, 34, 37, 53/54/72, 56/58, 58, 63, and 74. The proposed remedial action to address the human health risk issues is excavation of the upper ten feet of impacted soils and ex-situ bioremediation. However, in Areas 4/22, 25, 27, 28, 34, 37, 53/54/72, 56/58, 58, and 74, which are located in "future cut areas" as defined by the Porta Bella Plan, the excavations will need to extend to depths ranging from 20 to 40 feet. Area 1A North is also defined by the Porta Bella Plan as a "future cut area", but the perchlorate impacts are limited to the upper ten feet of soil, so there is no need to extend the depth of the remedial excavation.

The surface water SSLs are exceeded for the near surface soils in Areas 4/37, 6, 25, 34. The proposed remedial action to address surface water protection is excavation of the upper five feet of impacted soils and ex-situ bioremediation.

The Saugus aquifer SSLs are exceeded in Areas 1A-North, 1A-South, 4/22, 4/37, 6, 19, 25, 27, 28, 34, 53/54/72, 56/58, 58, 63, and 74. At the current time, there is no viable remedial alternative to address deep soil sources. Therefore, the default remedy for protection of the Saugus aquifer will be the western boundary Saugus aquifer containment system and other protective and/or institutional control measures discussed in Sections 6.2.1 and 6.2.2 of this RAP. If it can be concluded from the planned pilot testing that the innovative in-situ approaches are technically and economically viable for the deep zone soils, then the approach regarding soils with perchlorate concentrations exceeding the Saugus aquifer SSLs will be re-evaluated.

The estimated depths, volumes, and mass of perchlorate impacts to be addressed for these areas are summarized in Table 7-3.

SVOCs
PAH concentrations exceed the sensitive-use RBTCs for unrestricted land use in Area 27. The proposed remedial action is excavation of the upper four feet of impacted soil and off-site disposal. Although Area 27 is defined by the Porta Bella Plan as a "cut area", the PAH impacts are limited to the upper 4 feet of soil, so there is no need to extend the depth of the remedial excavation.

The estimated depth, volume, and mass of PAH-impacted soils to be handled for Area 27 are summarized in Table 7-3.

Metals
Metals concentrations do not exceed the sensitive-use RBTCs for near surface soils in the upper ten feet for unrestricted land use. Therefore, no remedial actions are necessary to address these RBTCs.

TPH
TPH concentrations exceed the sensitive-use RBTC for the unrestricted land use in Area 39. The proposed remedial action is excavation of the upper ten feet of impacted soil and off-site disposal. Although Area 39 is defined by the Porta Bella Plan as a "cut area", the TPH impacts are limited to the upper ten feet of soil, so there is no need to extend the depth of the remedial excavation.

The estimated depth, volume, and mass of TPH-impacted soils to be handled for Area 39 are summarized in Table 7-3.

Landfills
Although several areas within OU2 were reported to have received waste materials during historical Site operations, the borings and trenches excavated during the RI did not reveal the presence of any bulk waste materials, debris or other evidence

landfill materials, with the exception of minor isolated occurrences. Pending further screening of these areas for UXO and MEC, no remedial actions regarding removal of landfill materials is anticipated for OU2.

7.1.3 OU3 Areas

There are three areas within OU3 that exceed applicable RBTCs and/or SSLs (Area 14, 17, and 30). The remaining areas in OU3 either do not contain any chemical impacts or contain minor chemical impacts that do not exceed RBTCs or SSLs, and are already suitable for unrestricted land use.

VOCs

VOC concentrations exceed the sensitive-use RBTCs for unrestricted land use in Areas 14, 17, and 30. VOC concentrations do not exceed the Saugus aquifer SSLs, except for Area 14.

SVE operations are currently planned for Areas 14, 17, and 30. A pilot study for SVE operations at Area 14 is currently underway. The pilot study data will be used to evaluate the scope of the full-scale remedial operations. If any of the areas are excavated to address other COPCs, then ex situ SVE can be applied for excavated VOC-impacted soils. As discussed previously, the goal of the SVE operations will be to reduce VOC concentrations to unrestricted land use levels However, the completion of the remedial measures will be performance based (i.e., once the VOC reductions have reached asymptotic conditions, then the SVE operations will be considered complete) In the event that the residual VOC concentrations exceed unrestricted land use levels after the SVE system has reached asymptotic conditions, then institutional and/or engineering controls will be implemented to address the residual risk. The depths to which SVE will be applied, which are based on the interpreted extent of VOC impacts that exceed the RBTCs and vapor intrusion guidance, are limited to depths within the upper 100 feet of soil. The VOC-impacted areas in OU3 are not situated within "future cut areas" as defined by the Porta Bella Plan, so none of the proposed SVE applications would potentially need to extend to depths greater than 100 feet.

The estimated depth, volume, and mass of VOC impacts to be addressed for each of the areas are summarized in Table 7-3.

Perchlorate

Perchlorate concentrations exceed the home-gardener scenario RBTC for unrestricted land use in Areas 14 and 17. The proposed remedial action to address the human health risk issues is excavation of the upper ten feet of impacted soils and ex-situ bioremediation. The perchlorate-impacted areas in OU3 are not situated within "future cut areas" as defined by the Porta Bella Plan, so none of the proposed remedial excavations would need to extend to depths greater than 10 feet. The surface water SSLs are exceeded for the near surface soils in Area 14. The proposed remedial action to address the surface water issue is excavation of the upper five feet of impacted soils and ex-situ bioremediation.

The Saugus aquifer SSLs are exceeded in Area 14 and 17. At the current time, there is no viable remedial alternative to address deep soil sources. However, protection of the Saugus aquifer from the residual chemicals in deep soils in this area will be achieved through establishment of the western boundary Saugus aquifer containment system and other protective and/or institutional control measures discussed in Sections 6.2.1 and 6.2.2 of this RAP. If it can be concluded from the planned pilot testing that the innovative in-situ approaches are technically and economically viable for the deep zone soils, then the approach regarding soils with perchlorate concentrations exceeding the Saugus aquifer SSLs will be re-evaluated.

The estimated depth, volume, and mass of perchlorate impacts to be addressed for each of the areas are summarized in Table 7-3.

SVOCs

There is one area within OU3 (Area 14) where SVOC concentrations in shallow soils exceed the sensitive-use RBTCs and/or the additive risk from SVOC concentrations resulted in a cumulative cancer risk exceeding 1×10^{-6} In the southern portion of Area 14, TCDD concentrations in one sampling location exceeded the sensitive use RBTC Additionally, in a nearby sampling location, 2,4-dinitrotoluene and N-Nitrosodi-n-propylamine (NDPA) concentrations exceeded the sensitive use RBTCs.

In the central portion of Area 14, hexachlorobenzene concentrations exceeded the sensitive use RBTC at one sampling location. Additionally, in a nearby sampling location, TCDD concentrations exceeded the sensitive use RBTC.

In the northern portion of Area 14, the concentrations of TCDD and arsenic in one sampling location resulted in a cumulative cancer risk of 2.8×10^{-4}.

The areas of SVOC impacts within Area 14 are comingled with perchlorate-impacted soils that are more extensive than the SVOC impacts. The proposed remedial action is to segregate the SVOC-impacted soils during the perchlorate excavation activities and transport the SVOC-impacted soils off-site for disposal.

The estimated depths, volumes, and mass of SVOC-impacted soils to be handled for Area 14 are summarized in Table 7-3.

Metals

There is one area within OU3 (Area 14) where metals (lead, copper, cadmium, and thallium) concentrations exceed the sensitive-use RBTC and/or the additive risk from metals concentrations resulted in a Hazard Index greater than 1.

The areas of metals impacts within Area 14 are comingled with perchlorate-impacted soils that are more extensive than the areas with metals impacts. The proposed remedial action is to segregate the metals-impacted soils during the excavation activities and transport the metals-impacted soils off-site for disposal. The estimated depth, volume, and mass of metals-impacted soils to be handled in Area 14 is summarized in Table 7-3.

Landfills
The East Fork Landfill (Area 17) was reported to have accepted non-hazardous solid waste generated from the Site operations between approximately 1965 and 1986. During the RI, fill was encountered at 23 sample locations and the depth of fill throughout Area 17 ranges from 1 to 36 feet. Based on the RI results, it was estimated that Area 17 contains approximately 66,000 cubic yards of fill material. Trash and debris were encountered in the fill material observed in all of the trenches excavated in Area 17 including: asphalt, metal, wood, plastic, paper, glass bottles, drink cans, food cans, wire, cable, clothing, rope, styrofoam, cardboard, roots, and brush. Pending further screening of Area 17 for UXO and MEC, no remedial actions regarding removal of landfill materials is anticipated for OU3, aside from addressing fill soils with residual perchlorate and VOC impacts discussed previously.

7.1.4 OU4 Areas

There are four areas within OU4 that exceed applicable RBTCs and/or SSLs (Hula Bowl Canyons I, II, and IV, and Area 16A [stockpiled soils removed from Hula Bowl Canyon IV]).]). The remaining areas in OU4 either do not contain any chemical impacts or contain minor chemical impacts that do not exceed RBTCs or SSLs, and are already suitable for unrestricted land use.

VOCs
VOC concentrations exceed the sensitive-use RBTCs for unrestricted land use in Hula Bowl Canyons I, II, and IV. VOC concentrations also exceed Saugus aquifer SSLs in Hula Bowl Canyon I.

SVE operations are currently planned for Hula Bowl Canyon I. The initial phase of the pilot study for SVE operations at Hula Bowl Canyon I has been completed and the data are being evaluated. The pilot study data will be used to evaluate the scope of the full-scale remedial operations. As discussed previously, the goal of the SVE operations will be to reduce VOC concentrations to unrestricted land use levels However, the completion of the remedial measures will be performance based (i.e., once the VOC reductions have reached asymptotic conditions, then the SVE operations will be considered complete) In the event that the residual VOC concentrations exceed unrestricted land use levels after the SVE system has reached asymptotic conditions, then institutional and/or engineering controls will be implemented to address the residual risk. The depths to which SVE will be applied, which are based on the interpreted extent of VOC impacts exceeding the RBTCs and vapor intrusion guidance, are limited to depths within the upper 100 feet of soil.

However, in Hula Bowl Canyon I, which is located within a "cut area" as defined by the Porta Bella Plan, and the VOC impacts extend beyond 100 feet, evaluation of the vapor intrusion risks will extend to appropriate depths beyond 100 feet. Pending the outcome of those evaluations, the remedial efforts may also need to extend beyond 100 feet in order to meet the remedial objectives.

For Hula Bowl Canyons II and IV, the VOC concentrations are low (slightly above RBTCs) and implementation of SVE systems would be impractical. For these areas, the approach would be to re-evaluate the residual VOC impacts if future redevelopment plans indicate residential or commercial land use in this area.

The estimated depths, volumes, and mass of VOCs to be addressed for these areas are summarized in Table 7-3.

Perchlorate

Perchlorate concentrations exceed the home-gardener scenario RBTC for unrestricted land use in Hula Bowl Canyon I and Area 16A (soils stockpiled from Hula Bowl Canyon IV screening demonstration). The proposed remedial action to address the human health risk issues is excavation of the upper ten feet of impacted soils and ex-situ bioremediation. Although Hula Bowl Canyon I is located in a "cut area" as defined by the Porta Bella Plan, the perchlorate impacts are limited to the upper 5 feet of soil, so there is no need to extend the depth of the remedial excavation.

The surface water SSLs are exceeded for the near surface soils in Hula Bowl Canyon I and Area 16A. The proposed remedial action to address the surface water issue is excavation of the upper 5 feet of impacted soils in Hula Bowl Canyon I and removal of the impacted soil stockpiles in Area 16A, and ex-situ bioremediation.

The Saugus aquifer SSLs are exceeded in Area 16A. The proposed remedial action to address protection of the Saugus aquifer is removal of the stockpiles and ex-situ bioremediation.

The estimated depths, volume and mass of perchlorate impacted soils to be handled for these areas are summarized in Table 7-3.

SVOCs

There were no areas within OU4 that had SVOC concentrations in excess of the RBTCs or SSLs.

Metals

There is one area within OU4 (Hula Bowl Canyon I) where lead concentrations exceed the sensitive-use RBTC. Additionally, the combined risks from antimony, arsenic, barium, cadmium, and copper result in a Hazard Index (14) that is substantially higher than the generally accepted level of 1. The proposed remedial action to address the metals issues is excavation of the upper ten feet of impacted soil in Hula Bowl

Canyon I and off-site disposal. The estimated depth, volume and mass of metals-impacted soils to be handled for this area are summarized in Table 7-3.

Landfills
Hula Bowl Canyons I, II, III, and IV (Area 16) were all reported to have accepted non-hazardous solid waste generated from the Site operations. Based on the RI results, it was estimated that Hula Bowl Canyon I contains approximately 30,000 cubic yards of fill material; Hula Bowl Canyon II contains approximately 5,000 cubic yards of fill material; and Hula Bowl Canyon III contains approximately 2,500 cubic yards of fill material. Hula Bowl Canyon IV, which was excavated and screened as part of an USACE Technologies Demonstration project, previously contained approximately 8,100 cubic yards of fill material. Approximately 2,800 cubic yards of screened soil remains stockpiled at the head of the canyon. Trash and debris were encountered in the fill material observed in Hula Bowl Canyons I, II, and III including: metal, wood, plastic, paper, cans, glass, nails, tires, fire hose, chain link fence, porcelain, styrofoam, appliances, drums, and other miscellaneous trash items. Pending further screening for UXO and MEC, no remedial actions regarding removal of landfill materials for Hula Bowl Canyons I, II, and III are anticipated for OU4, aside from addressing the soils with residual perchlorate, VOC, and/or metals impacts discussed previously.

7.1.5 OU5 Areas

There are twenty three areas within OU5 that exceed applicable RBTCs and/or SSLs (Areas 2, 10, 11/29, 12, 13, 18, 20, 21, 31/45, 33, 38, 41, 46, 47, 48/ 49, 50, 51, 52, 60, 61, 67, 68, and 69).). The remaining areas in OU5 either do not contain any chemical impacts or contain minor chemical impacts that don't exceed RBTCs or SSLs, and are already suitable for unrestricted land use.

VOCs
VOC concentrations exceed the sensitive-use RBTCs in Areas 2, 13, 18, 20, 31/45, 33, and 48/49. VOC concentrations also exceed the Northern Alluvium SSLs in Areas 18 and 48/49.

SVE operations are currently planned for Areas 2, 31/45, 33, and Area 48/49. The initial phase of the pilot studies for SVE operations at Area 2 and 31/45 have been completed and the data are being evaluated. A pilot study for SVE operations at 48/49 is currently in the planning stages. DPE is also being evaluated for Area 48/49. The pilot study data will be used to evaluate the scope of the full-scale remedial operations. As discussed previously, the goal of the SVE operations will be to reduce VOC concentrations to unrestricted land use levels However, the completion of the remedial measures will be performance based (i.e., once the VOC reductions have reached asymptotic conditions, then the SVE operations will be considered complete).). In the event that the residual VOC concentrations exceed unrestricted land use levels after the SVE system has reached asymptotic conditions, then institutional and/or engineering controls will be implemented to address the residual

risk. The depths to which SVE will be applied, which are based on the interpreted extent of VOC impacts exceeding the RBTCs and vapor intrusion guidance, are limited to depths within the upper 100 feet of soil. However, in Area 2, which is located in a "cut area" as defined by the Porta Bella Plan and the VOC impacts extend beyond 100 feet, evaluation of the vapor intrusion risks will extend to appropriate depths beyond 100 feet. Pending the outcome of those evaluations, the remedial efforts may also need to extend beyond 100 feet in order to meet the remedial objectives.

The VOC concentrations in the remaining areas are generally low (slightly above RBTCs) and implementation of SVE systems would be impractical. For Area 13, soil excavations are currently planned to address perchlorate impacts that would also remove some of the VOC-impacted soils These excavated soils would be initially treated via ex situ SVE to address the VOCs, prior to ex situ bioremediation to address the perchlorate The residual VOC concentrations remaining in place would be re-evaluated to assess whether any significant health risks remain that could require further action.

For Area 20, which does not have co-mingled VOC and perchlorate impacts, the approach would be to re-evaluate the residual VOC impacts if future redevelopment plans indicate residential or commercial land use in this area.

The estimated depths, volumes, and mass of VOCs to be addressed are summarized in Table 7-3.

Perchlorate
Perchlorate concentrations exceed the home-gardener scenario RBTC for unrestricted land use in Areas 2, 10, 11/29, 12, 13, 18, 21, 41, 46, 50, 51, 61, 67, 68, and 69. The proposed remedial action to address the human health risk issues is excavation of the upper ten feet of impacted soils and ex-situ bioremediation. However, in Area 21, which is defined by the Porta Bella Plan as a "cut area", the excavations will need to extend to a depth of approximately 20 feet.

The surface water SSLs are exceeded for the near surface soils in Areas 2, 10, 11/29, 12, 21, 31/45, 33, 38, 41, 46, 50, 51, 52, 60, 61, 67, 68, and 69. The proposed remedial action to address the surface water issue is excavation of the upper five feet of impacted soils and ex-situ bioremediation.

The Northern Alluvium SSLs are exceeded in Areas 10, 11/29, 12, 18, 31/45, 38, 41, 48/49, 50, 51, 52, 60, 61, 67, 68, and 69. The proposed remedial action to address protection of the Northern Alluvium aquifer is excavation of the impacted soils to either the water table or practical limits (whichever is reached first) and ex-situ bioremediation.

The estimated depth, volume, and mass of perchlorate impacted soils to be handled for these areas are summarized in Table 7-3.

SVOCs
There is one area within OU5 (Area 11/29) where SVOC concentrations exceed the sensitive-use RBTC and/or the additive risk from SVOC concentrations resulted in a cumulative cancer risk greater than 1×10^{-6}.

The proposed remedial action to address the SVOC issues is excavation of the upper five feet of impacted soil and off-site disposal.

The estimated depth, volume, and mass of SVOC-impacted soils to be handled for Area 11/29 are summarized in Table 7-3.

Metals
There are four areas within OU5 where metals concentrations exceed sensitive-use RBTCs: Area 11/29, Area 38, Area 47, and 69. There were several other areas with OU5 where metals were detected at concentrations notably higher than background levels: Areas 8, 20, 21, 24, 41, 50, 51, and 60. However, for these areas, only the additive risk from the metals concentrations in Area 21 resulted in a hazard index greater than one.

The proposed remedial action to address the metals issues is excavation of the upper ten feet of impacted soil and off-site disposal.

The estimated depth, volume, and mass of metals-impacted soils to be handled for these areas are summarized in Table 7-3.

TPH
TPH concentrations exceed the sensitive-use RBTCs in Area 51. The proposed remedial action is excavation of the upper ten feet of impacted soil and off-site disposal. The estimated depth, volume, and mass of TPH-impacted soils to be handled for Area 51 are summarized in Table 7-3.

Landfills
Area 2 was reported to have been operated as a small landfill for a variety of non-hazardous solid wastes generated from the Site operations prior to 1970. Additionally, landfill trash and debris deposits were discovered at Areas 11 and 51 during the RI. Pending further screening for UXO and MEC, no remedial actions regarding removal of landfill materials are anticipated for OU5, aside from addressing fill soils with residual perchlorate, VOC, and/or metals impacts in Areas 2, 11, and 51 discussed previously.

7.1.6 OU6 (RCRA Unit)

OU6, which is also designated as Area 1 is the only RCRA unit at the Site that has not been closed. It is located entirely within OU2. OU6 and is associated with the former Building 317 surface impoundment. Previous closure activities for Area 1 included:

- Excavation and removal of the former surface impoundment.

- Excavation of between 50,000 and 60,000 cubic yards of impacted soils to a depth of approximately 60 feet.
- Operation of an SVE system from 1988 through 2002, during which time approximately 40,000 pounds of VOCs were extracted and treated.
- Ongoing quarterly groundwater monitoring of Saugus aquifer monitoring wells since 1988.

Based on the results of both the soil and groundwater RIs, the following conclusions have been made regarding Area 1:

- Releases from the former non-RCRA surface impoundment have impacted soil, soil gas, and perched water. The extents of the impacts have been adequately characterized.
- The primary COPCs at Area 1 are perchlorate and TCE.
- Groundwater within the Saugus formation directly beneath Area 1 has not been impacted.
- Past lateral "stair step" transport pathways from the perched water zone through the upper portion of the Saugus formation to the northwest of Area 1 occurred when the former non-RCRA impoundment provided an ongoing source of recharge water to the perched zone. Monitoring wells completed within the upper portion of the Saugus formation are currently dry, indicating that the past transport pathways are no longer active under the current recharge conditions. Past Area 1 releases to the regional Saugus aquifer northwest of Area 1 are likely comingled with releases from other areas that are not regulated by RCRA.

VOCs

VOC concentrations exceed the sensitive-use RBTCs for unrestricted land use, as well as the Saugus aquifer SSLs.

SVE operations are currently planned for Area 1. Although SVE operations were previously conducted at Area 1, and limited pilot studies were previously conducted during the RI, additional pilot studies may be warranted to optimize VOC mass removal efforts. The depths to which SVE will be applied, which are based on the interpreted extent of VOC impacts that exceed the RBTCs and vapor intrusion guidance, are limited to depths within the upper 100 feet of soil. The VOC-impacted area in Area 1 is not situated within a "cut area" as defined by the Porta Bella Plan, so the proposed SVE application would not need to potentially extend to depths greater than 100 feet.

The estimated depth, volume, and mass of VOCs to be addressed for Area 1 are summarized in Table 7-3.

Perchlorate
Perchlorate-impacted soils were previously excavated to depths extending to approximately 60 feet. Therefore, no further remedial actions are necessary to protect human health from perchlorate impacts.

The surface water SSLs are exceeded for the near surface soils in Area 1. However, Area 1 has already been excavated to practical limits, so no further excavation would be conducted to address the surface water SSL; instead, surface water quality protection measures will be incorporated into the post-closure activities of the RCRA unit.

The Saugus aquifer SSLs are exceeded in Area 1. At the current time, there is no viable remedial alternative to address deep soil sources. Therefore, the default remedy for protection of the Saugus aquifer will be the western boundary Saugus aquifer containment system and other protective and/or institutional control measures discussed in Sections 6.2.1 and 6.2.2 of this RAP. If it can be concluded from the planned pilot testing that the innovative in-situ approaches are practicable for the deep zone soils, then the approach regarding soils with perchlorate concentrations exceeding the Saugus aquifer SSLs will be re-evaluated.

SVOCs
There were no SVOC concentrations detected in excess of the RBTCs or SSLs for Area 1.

Metals
There were no metals concentrations detected in excess of the RBTCs or SSLs for Area 1.

RCRA Issues
The goal of the remedial actions planned for Area 1 is "clean closure" of the RCRA unit. This goal is currently being evaluated along with the alternative of "waste in place" closure in view of the schedule for the planned pilot studies. Once an option is selected, it will be submitted to DTSC for approval in a separate document.

7.2 Rationale for Selection of Remedy

The primary rationale for the selection of the remedy was that it utilizes proven risk-based cost-effective soil remedial measures that have been evaluated and selected based on their ability to effectively address:

- Protection of human health from exposure to chemicals in surface and near-surface soils;
- Protection of ecological receptors from exposure to chemicals in surface and near-surface soils;
- Protection of surface water quality;

- Protection of groundwater quality;
- Protection of downgradient receptors (public supply wells); and
- Overall compliance with regulatory requirements.

Although the goal of the remedies that have been developed as part of this RAP are to achieve unrestricted land use goals, they are intended to be kept flexible so that they can be modified to allow for integration of the remedial measures with future Site redevelopment and grading operations, should a new redevelopment plan be in place at the time of cleanup. Any Site redevelopment would include mass grading operations that would likely involve moving a substantial volume of soil with significant cut and fill areas due to the current Site topography. Additionally, any Site redevelopment plans would likely consist of a combination of residential, commercial/retail, recreational, and open space land use, each of which would have specific risk exposure tolerance limits and, hence, corresponding target cleanup goals.

The remedies presented in this RAP were also selected in consideration of the overall comprehensive remedial strategy that encompasses all measures necessary to address both shallow and deeper impacted soils as well as groundwater containment remedies for the Site. Although the remedies do not include any specifics regarding the groundwater remedial alternatives, they have been prepared within the context of conducting adequate on-site groundwater containment activities to prevent/limit offsite movement of chemicals from the Site, while reducing on-site groundwater chemical mass. As previously stated, the groundwater containment efforts consist of the following elements:

- Northern alluvium containment system (OU5) – There is an operating system that currently extracts and treats approximately 60 gallons per minute (gpm) of groundwater, and is permitted for up to 100 gpm.
- On-site Saugus formation containment (OU7) – This system is in the planning stages and a pilot study work plan was reviewed and approved by DTSC in December 2008 and is currently being implemented. The purpose of the Saugus aquifer containment pilot work is to install the initial wells, conduct pumping tests, and perform groundwater modeling to develop the design criteria for the full-scale Saugus groundwater containment system. It is expected that the full-scale system will extract and treat approximately 300 to 500 gpm.
- Off-site containment at the Saugus 1 and Saugus 2 Production Wells – This system, which is in construction and is expected to be on line in 2010, will contain and remediate impacted groundwater within its capture zone, while protecting other water supply wells downgradient of the Saugus 1 and 2 wells.

This context is significant, and a comprehensive approach for shallow and deeper soil remediation and groundwater containment and treatment is necessary because there is a significant uncertainty regarding the practicability of a remedial alternative for deep perchlorate impacted soils at this Site. However, regardless of the degree of success of on-site source removal measures for deep soils, mitigation and protection of groundwater resources will be achieved. The OU7 FS and RAP will address both perched groundwater and deeper groundwater at the Site.

7.3 Timeframes for Remedy Implementation

The overall objective of the cleanup program at the Whittaker Bermite site is to implement effective remedies that will make the conditions of the Site protective of human health and the environment. Regardless of the uncertainties related to the outcome of various pilot programs and future redevelopment, a number of remedial activities are currently in varying stages of implementation. The current schedule prioritizes risks that if not addressed immediately, may pose an adverse impact to human health or the environment.

The following actions are in progress:

- Storm water management (ongoing);
- DU removal in Areas 57 and 14 (expected to be completed summer 2010); and
- MEC and UXO screening (expected to be completed 2011-2012).

The current schedule also includes the following pilot studies (in varying stages of implementation):

- Pilot testing of SVE systems at the source areas that have sufficiently high concentrations that the remedial excavations for perchlorate or other COPC impacts could not take place until the VOC levels have been substantially lowered (completed);
- Bench testing of in-situ biological treatment of deeper perchlorate impacted soils (ongoing); and
- Pilot testing of technologies for treatment of perchlorate and VOC-impacted perched water zones (planning). Pilot testing of groundwater containment with the Saugus aquifer along the western property boundary (well installation is ongoing).

The current schedule anticipates the following will occur in the near future:

- Dual Phase Extraction pilot studies in OU5 to address VOC hot spots;
- SVE in areas OU2-6 in anticipation of soil treatment for perchlorate-impacted soil;

- Completion of OU 7 containment pilot program; and
- Removal and screening of landfill areas that have either MEC/UXO and/or chemical contamination issues.

The approach taken in this RAP retains sufficient flexibility to apply risk-based cleanup goals under varying development scenarios, and ensures that the remedial efforts will render the Site safe for human health and the environment under both the current Site conditions and future anticipated grades and uses.

Section 8
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Letter No. E7

Glaser, Mitch

From: Jennifer Kilpatrick [jekilpatrick@hotmail.com]
Sent: Tuesday, February 22, 2011 5:01 PM
To: Glaser, Mitch; jsmisko@santa-clarita.com
Subject: Submission of Most Recent Remediation Progress Report on Whittaker Bermite OU2-OU6 Dated for Administrative Record on One Valley, One Vision General Plan Updates
Attachments: BermiteJanuary2011WhittakerProgressReport.pdf

TO: Los Angeles County Regional Planning & City of Santa Clarita Planning Departments
Attention: Mitch Glaser & Jason Smisko

RE: Comments on One Valley, One Vision General Plan Updates for County's Santa Clarita Valley Area and City of
Santa Clarita Valley

DATE: 2/22/11

FROM: Jennifer Kilpatrick for Santa Clarita Organization for Planning the Environment (SCOPE)

I am attaching, as a follow up on the formal comment I emailed to you today, on the OVOV General Plans now pending before the County and City, a copy of the January 2011 monthly report by Whittaker Corporation's lead toxics remediation consultant to the California Department of Toxic Substances Control concerning the status of Whittaker Corporation's remediation of Operating Units 1 through 6 at Whittaker Bermite. 1

The three "paper" major roads shown on OVOV's Circulation Element and other elements, and referred to in my longer comment to you, on behalf of SCOPE, as of today's date, have their roadbeds in DTSC Operating Units 2-6. Those "paper roads" are: 2

(1) Via Princessa on the Whittaker Bermite property;
(2) Santa Clarita Parkway on the Whittaker Bermite property and across the Santa Clara River; and
(3) An extension of Magic Mountain Parkway from its current intersection with Railroad Avenue up into the Bermite property.

Again, the reason that SCOPE is submitting the attached Whittaker Corporation monthly report to DTSC, is to remind both the County and the City that the Whittaker Bermite property's Operating Units 2, 3, 4, 5 and 6 are very far from being remediated of toxic substances to such an extent that three "paper" major roads in the City of Santa Clarita will be built in the near future. 3

We are hereby advising you that because the DTSC approved remediation of the soil on the Whittaker Bermite property has not yet occurred, and the remediation is far from being completed and approved by DTSC where the roadbeds for those three roads are located in OU2 through OU6 on Whittaker Bermite, any use of those three roads, for the purpose of running traffic studies analyzing levels of service for roads in the County or City or for concluding in the text of the Circulation Elements in the OVOV plans that no County or City roads will operate at LOS E or LOS F is pure sophistry, or to put it less politely, a breach of the various California statutes and regulations governing preparation and the content of General Plans. It would be legitimate to include those "paper" roads in traffic studies and LOS calculations were the ground on which they are built fully remediated of toxins and released by DTSC for road building. However, that is not factually the case, nor is it likely to be the case for at least 5 years or more, or more if the routes of the roadbeds traverse (a) soil heavily contaminated with TCE or PCE (carcinogenic volatile organic chemicals) or (b) the multiple landfills (contents factually unknown) located within the Whittaker Bermite property. 4

As a result, SCOPE and all other participants in the planning process reserve the right to administratively and judicially challenge the factual assumptions in the County's and City's traffic models supporting the OVOV General Plans, as well as the traffic Level of Service determinations resulting therefrom which are stated in the Circulation Elements and in other parts of the plans. 5

SCOPE suggests that your departments re-run your traffic models, reports and LOS calculations without those three "paper" major roads through Whittaker Bermite and to be paid for by Whittaker Bermite's land owner, which as you know are presently in Chapter 11 bankruptcy in Phoenix in a case called In Re RFI Realty, Inc. USBC Case No. 02-04-bk-10486-CGC. 6

January 14, 2011

Project No. 9967.000.0

Mr. Jose Diaz
Department of Toxic Substances Control
Site Mitigation Branch
9211 Oakdale Avenue
Chatsworth, California 91311

Re: Former Bermite Facility, Santa Clarita, California
Summary Report for December 2010

Dear Mr. Diaz:

This letter constitutes a progress report for the month of December 2010, prepared pursuant to Task 4 and Section 6.3 of the "Imminent and Substantial Endangerment Determination and Order and Remedial Action Order" (the Order) that the Department of Toxic Substances Control (DTSC) issued on November 22, 2002, for the former Bermite facility (site) in Santa Clarita, California.

SECTION I – SOIL ISSUES

Specific actions taken on behalf of the respondent, actions expected to be undertaken, and planned activities for soil issues are summarized in the following sections.

OU1 REMEDIATION

Activities for This Report Period (1)

All excavation, bio-treatment, backfilling, and slope restoration activities for Operable Unit (OU1) remediation program were completed during previous reporting periods. CDM subsequently completed the draft remedial action completion report that was submitted to the DTSC. The DTSC provided review comments in a letter dated June 8, 2010 and requested that a revised report or a response to comments be submitted by July 15, 2010. CDM submitted the response to comments letter to the DTSC on July 15, 2010. The DTSC acknowledged the response to comments on July 21, 2010 and indicated acceptance of the final OU1 report once the soil vapor extraction (SVE) operations have been completed and incorporated into the report.

No activities were conducted during this reporting period regarding the OU1 remedial action completion report.

Anticipated Activities for This Month

No anticipated activities this month.

AMEC Geomatrix, Inc.
510 Superior Avenue, Suite 200
Newport Beach, CA
USA 92663-3627
Tel (949) 642-0245
Fax (949) 642-4474
www.amecgeomatrixinc.com

AMEC Geomatrix

Long-Term Actions

Upon completion of the SVE operations in OU1, incorporate the SVE data, and submit the final remedial action completion report to the DTSC.

Activities for This Report Period (2)

As a follow up to the meeting held with the DTSC on September 23, 2010 regarding the status and the completion of SVE operations in OU1 and attainment of the remedial goals in Area 43 and Building 329, the DTSC indicated that they agreed that further active SVE operations were no longer needed for the OU1 areas, pending the results of confirmation soil gas sampling in Areas 7, 43, 55, and Building 329.

CDM prepared a memo summarizing the proposed scope of work for the confirmation soil gas sampling, which was submitted to the DTSC for review on January 5, 2011.

Anticipated Activities for This Month

Respond to questions or comments from the DTSC on the memo and schedule field activities.

Long-Term Actions

Document post-SVE soil gas conditions and decommission the SVE systems.

SITE-WIDE SOILS REMEDIAL ACTION PLAN FOR OU2 THROUGH 6 (SITE-WIDE SOILS RAP)

Activities for This Report Period

The final version of the OU2-6 RAP (the Site-Wide Soils RAP), which included revisions in response to comments received during the public comment period, was submitted to the DTSC on November 30, 2010. DTSC approved the Site-Wide Soils RAP in its letter dated December 6, 2010. The remedial actions outlined in the approved Site-Wide Soils RAP will be followed and used as the basis for the Remedial Design documents.

Anticipated Activities for This Month

No further actions are planned.

SITE-WIDE SOILS REMEDIAL DESIGN FOR OU2 THROUGH 6

Activities for This Report Period

Additional field investigations were initiated at the Site on November 22, 2010 in support of the Site-Wide Soils Remedial Design (RD) to fill in data gaps for the proposed perchlorate excavation areas. During this reporting period, CDM continued with the additional investigation activities.

CDM also continued with preparation of the RD document.

Anticipated Activities for This Month

Continue the additional investigation and preparation of the RD document.

Long-Term Actions

Upon completion of the additional investigation, incorporate the results, and finalize the draft RD document for submittal to the DTSC for review.

PILOT STUDIES (SVE)

Activities for This Report Period

CDM had previously prepared a pilot study work plan for SVE of VOC-impacted soils at OU2 through OU6. The DTSC approved the revised SVE work plan in a letter dated October 22, 2008.

The field pilot programs for Areas 2, 4, 27, 31/45, 53/54/72, Area 14-South, Area 14-Central, and Hula Bowl Canyon I were completed during prior reporting periods. During this reporting period CDM worked on addressing review comments to the SVE pilot study report received from Whittaker/AMEC.

Anticipated Activities for This Month

Address review comments/revisions received from Whittaker/AMEC and finalize the draft for submittal to the DTSC.

Long-Term Actions

Complete the SVE pilot study report for submittal to the DTSC. Incorporate the results of the SVE pilot study to the Site-Wide Soils RD document for OU2 through OU6.

PILOT STUDIES (GEDIT)

Activities for This Report Period

CDM had previously prepared a pilot study work plan for in-situ bioremediation of perchlorate impact to deep soils via Gaseous Electron Donor Injection Technology (GEDIT). The DTSC provided conditional approval of the GEDIT work plan on November 14, 2008.

The laboratory bench-scale treatability study for the GEDIT pilot study was completed during a previous reporting period.

During this reporting period, CDM continued with the data evaluation and report preparation.

Anticipated Activities for This Month

Complete the treatability study report and submit to Whittaker/AMEC for review.

Long-Term Actions

Complete GEDIT bench-scale treatability documentation reports for submittal to the DTSC. Incorporate the results of the bench-scale study to determine the feasibility of the field GEDIT pilot study.

PILOT STUDIES (SVE/DPE)

Activities for This Report Period

CDM conducted Phase II (DPE for saturated zone soils) and Phase III (combined SVE and DPE operations), the final post-test sampling event, and decommissioned the pilot study system operation in Area 48/49 of OU5.

CDM continued with data evaluation and preparation of the pilot study report.

Anticipated Activities for This Month

Complete data evaluation and preparation of the pilot study report for submittal to the Whittaker/AMEC for review.

Long-Term Actions

Complete pilot study report for submittal to the DTSC. Incorporate the results of the pilot study into the RD document.

SECTION II – SOILS INTERIM REMEDIAL MEASURES AND REMOVAL ACTIONS

DEPLETED URANIUM (DU) INVESTIGATION AND CLEARANCE ACTIVITIES

Activities for This Report Period

Energy*Solutions* incorporated comments received on the second draft of the Final Status Survey (FSS) report and sent it to Whittaker/AMEC for review on December 21, 2010.

Anticipated Activities for This Month

EnergySolutions will incorporate any additional comments received from Whittaker/AMEC and provide final report to Whittaker/AMEC.

Long Term Actions

Submit the FSS report to the DTSC, California Department of Public Health (DPH) – Radiological Health Branch, and Los Angeles County Radiological Section.

MEC Investigation and Clearance Activities

Activities for This Report Period

EODT submitted the draft investigation report for the MEC clearance conducted during the DU-impacted soil removal to Whittaker/AMEC for review.

Anticipated Activities for This Month

Complete investigation report for the MEC clearance for DU-impacted soil removal.

Long Term Actions

Submit investigation report to the DTSC. Clear potential MEC from areas (i.e., Hula Bowl II/III) identified as removal sites in the HSA report. Complete the MEC investigation and confirmation in the areas designated as Further Investigation and No Further Action Areas, respectively.

SECTION III – GROUNDWATER AND SURFACE WATER ISSUES

Specific actions taken on behalf of the respondent, actions expected to be undertaken and planned activities for groundwater and surface water issues are summarized in the following sections.

Groundwater (OU7) Feasibility Study

Activities for This Report Period

The draft OU7 Feasibility Study (FS) report was provided to the DTSC and the Castaic Lake Water Agency (CLWA) for review and comment in late April. The DTSC provided comments on the draft OU7 FS in a letter dated October 18, 2010 and requested submittal of the revised OU7 FS by November 19, 2010. In order to allow additional time to incorporate comments provided by the CLWA, the DTSC approved an extended submittal date of January 19, 2011. The CLWA's comments were received on January 5, 2011.

To support the OU7 FS evaluations, step drawdown testing was conducted in selected OU6 perched zone wells to assess hydraulic properties. In addition, a bench-scale treatability test for enhanced biodegradation of perchlorate and VOCs was performed on a water sample collected from the perched water beneath OU6.

Anticipated Activities for This Month

The draft OU7 FS is being revised to incorporate the DTSC and the CLWA comments. The revised report will then be submitted to the DTSC and distributed to other stakeholders. Evaluation of potential pilot studies for the OU6 perched zone will continue.

Long-Term Actions

Complete revisions to the draft OU7 FS report and use it as the basis to develop the OU7 RAP.

INTERIM REMEDIAL MEASURES AND PILOT PROGRAMS FOR GROUNDWATER

SAUGUS AQUIFER EXTRACTION PILOT PROGRAM

Activities for This Report Period

The Work Plan, Saugus Aquifer Pilot Remediation Well Network, Operable Unit 7 was submitted to DTSC on September 22, 2008. DTSC provided comments on November 18, 2008 and subsequently provided conditional approval of the Work Plan on December 31, 2008. Implementation of the Work Plan started by AECOM and BC2 in November 2009 and continued during this period. The work accomplished during this period is summarized below:

- Drilling activities continued using two full-time onsite drilling rigs.
- Completed installation of PZ-7B, and PZ-7C;
- Continued installation of RMW-8A and RMW-8B. Installed five temporary wells in the boreholes for RMW-8A and RMW-8B, including RMW-8A-T1 (200'-210'), RMW-8A-T2 (235'-245'), RMW-8B-T1 (265'-275') RMW-8B-T2 (300'-310'), and RMW-8B-T3 (335'-345');
- Purged and sampled temporary wells RMW-8A-T1 (200'-210'), RMW-8A-T2 (235'-245'), RMW-8B-T1 (265'-275') RMW-8B-T2 (300'-310') and RMW-8B-T3 (335'-345');
- Completed step-drawdown tests at RMW-7B and EW-3B;
- Completed a 24-hr pump test at EW-2A,
- Purged and sampled RMW-4A;
- Continued management of drilling and aquifer testing derived wastes; and,
- Continued data collection, management, and analysis.

Anticipated Activities for This Month

- Continuation of drilling and well installation activities in accordance with the scope of work outlined in the Work Plan. The field program will be modified, as needed, based on site observation and weather conditions;
- Continuation of well development and groundwater sampling activities;
- Continuation of step-drawdown and pump tests; and,
- Data collection, management, and analysis.

Long-Term Actions

Implement the Saugus Aquifer Extraction Pilot Program. Incorporate the results of the groundwater pilot program into OU7 RAP and remedial design document.

NORTHERN ALLUVIUM GROUNDWATER TREATMENT SYSTEM (NATP) OPERATION

Activities for This Report Period (1)

An Interim Remediation Pumping Program was started in Northern Alluvium Areas 11, 67, and 75 in 2006. An alternate extraction well 75-MW-35 (for higher groundwater extraction) and six hot spot wells were connected to the new higher capacity groundwater treatment system in 2007. Sustained pumping of extraction well 75-MW-35 that began in mid-October 2007 continues to date, with the exception of a brief period of shut down for treatment system maintenance.

As of December 2010, approximately 32,525,994 gallons of impacted water was treated and discharged in compliance with the National Pollutant Discharge Elimination System (NPDES) permit. Approximately 24 percent of the treated volume during December 2010 was from the extraction wells of the Northern Alluvium pumping system. Of the remaining 76 percent of treated volume, 51 percent was from investigation/monitoring waste water generated during the EW-2A and EW-2B aquifer tests. The remaining 25 percent of treated volume was from storm water retained on site.

The December monthly compliance sample for the NATP was collected on December 6, 2010. The sampling results indicated that the system was in compliance with the discharge requirements of the NPDES permit during December 2010.

Media were replaced in the treatment vessels as follows:

- December 6, 2010 – removed/replaced perchlorate and GAC media
- December 13, 2010 - removed/replaced nitrate media
- December 20, 2010 - removed/replaced perchlorate media. Perchlorate vessels were moved to the temporary storm water filtration and treatment system, discussed below.

Installation and testing of a temporary storm water filtration and treatment system began in December 2010 to process storm water collected in the storm water retention ponds. The temporary treatment system is intended to minimize the volume of storm water processed in the NATP by treating and discharging storm water to one of the other approved discharge locations specified in the NPDES permit. Initial compliance sampling for outfall M-004 was conducted December 27, 2010. The sampling results for outfall M-004 indicated that the temporary storm water filtration treatment system was in compliance with the discharge requirements of the NPDES permit during December 2010. Discharge to outfall M-004 was initiated on December 27, 2010. During December 2010, approximately 60,100 gallons of impacted water was treated and discharged to outfall M-004 in compliance with the NPDES permit.

Anticipated Activities for This Month

- Continue the pumping, treatment, and discharge system operation and routine weekly and monthly NPDES compliance sampling and media change outs as needed.
- Evaluate need for a temporary storm water filtration system depending on the weather and accumulation of stormwater.
- Monitoring of the aquifer response to pumping from the alternate extraction well 75-MW-35 and the downgradient site boundary low flow extraction wells will continue.

Long-Term Actions

Continue operating the extraction and treatment system and conduct additional performance monitoring. Evaluate NATP performance and provide recommendations to be incorporated to the OU7 RAP.

Activities for This Report Period (2)

Potential application of remedial technologies for Northern Alluvium groundwater hot spots, including evaluation of the Area 75 boundary containment established by sustained operation of the low flow pumping wells is being addressed in the OU7 FS. As stated in Section I – Pilot Studies (SVE/DPE) above, a work plan for soil vapor extraction and dual-phase extraction pilot study at Area 48/49 was submitted to DTSC on August 2, 2010. DTSC approved this work plan on August 23, 2010.

CDM completed the field pilot study and decommissioned the pilot study system during the previous reporting period, and conducted data evaluation and preparation of the pilot study report.

Anticipated Activities for This Month

Continue with data evaluation and preparation of the pilot study report for submittal to the DTSC.

Long-Term Actions

Complete pilot study report for submittal to the DTSC. Additional source control measures in the Northern Alluvium will be considered and recommended where determined to be necessary.

GROUNDWATER MONITORING

Activities for This Report Period

- Continued optimization of the groundwater database;
- Continued preparation of the third quarter groundwater monitoring report,
- Prepared a revised Annual Groundwater Monitoring Report and submitted to the DTSC.

Anticipated Activities for This Month

- Complete and submit the third quarter groundwater monitoring report.

Long-Term Actions

- Continue monitoring and reporting of the proposed network of monitoring wells on the updated schedule presented in Technical Memorandum No. 8.

Storm Water Monitoring

Activities for This Report Period

Pursuant to the site Storm Water Pollution Prevention Plan, Environ continued coordinating the implementation of short-term surface water run-off mitigation measures. Implementation of the short-term mitigation measures is being coordinated with CDM, particularly in the areas of the site where soil remediation activities have occurred. Surface water run-off sampling was conducted following significant rainfall events in accordance with the site-wide surface water runoff sampling plan.

Anticipated Activities for This Month

Upgrades to the short-term mitigation measures will continue as necessary. CDM is working on a plan for upgrading the short-term mitigation measures. Surface water run-off sampling will be conducted following significant rainfall events in accordance with the site-wide surface water runoff sampling plan.

Long-Term Actions

Long-term mitigation of the drainages and excavations will be conducted in conjunction with the soil remediation.

RCRA MONITORING AND CLOSURE

Activities for This Report Period (1)

AMEC submitted documentation supporting clean closure certification of the former Building 317 Resource Conservation and Recovery Act (RCRA)-permitted lined surface impoundment on November 11, 2009 for DTSC review. The DTSC has reviewed the documents and discussed the matter with the Whittaker's team in two teleconferences. Whittaker's team also met with DTSC on August 11, 2010 and provided additional support and recommendations for a path forward for clean closure of the RCRA unit.

Anticipated Activities for This Month

We are anticipating a response from the DTSC to our request for closure and our recommended path forward.

Long-Term Actions

Proceed with closure of the RCRA unit and incorporate all remaining remedial and monitoring activities to OU2 through OU6 and OU7 RAPs.

Activities for This Report Period (2)

Complete the third quarter 2010 groundwater monitoring report.

Anticipated Activities for This Month

The third quarter 2010 RCRA groundwater monitoring report was submitted to the DTSC on January 3, 2011. Begin preparation of the fourth quarter 2010 RCRA groundwater monitoring report.

Long-Term Actions

The current RCRA groundwater monitoring program will be modified to include proposed wells and frequency and the DTSC input to the monitoring plan.

SECTION IV – REQUIREMENTS UNDER THE ORDER THAT WERE NOT COMPLETED

All requirements of the Order were completed. Whittaker has met or exceeded all the substantive requirements of the Order.

SECTION V – PROBLEMS OR ANTICIPATED PROBLEMS IN COMPLYING WITH THE ORDER

Following the DTSC's agreement with Whittaker's proposed modifications to implementation plans in compliance with the Order reflected in the letter dated September 28, 2004, the DTSC's letter dated July 11, 2005, included a schedule for submitting a number of documents. All deadlines have been met and documents have been submitted per requested schedule.

SECTION VI – RESULTS OF SAMPLE ANALYSIS, TESTS, AND OTHER DATA

Whittaker has instructed its contractors to continue to provide the DTSC staff with raw data sets for ongoing quarterly groundwater monitoring events and RI/FS work upon receipt from the lab.

Sincerely yours,
AMEC Geomatrix, INC.

Hassan Amini, PhD, CHG
Project Coordinator

cc: Eric Lardiere, Esq., Whittaker Corp; Joseph Armao, Winston & Strawn, LLP; William Weaver, CDM; Jessica Donovan, ENVIRON; Paul Bergstrom, Knight Piésold; Jay Ferguson, EODT; Robert Woodard, Energy Solutions; Essi Esmaili, AECOM; Tim Bricker, Santa Clarita L.L.C.; Megan Trend, Chubb Financial Solutions; Cindy Hunter, MariKay Fish, Julie Diebenow, Chartis; Vitthal Hosangadi, NOREAS; Nadine Hunt-Robinson, Zurich North America; Jeff Hogan, City of Santa Clarita; Yueh Chuang, CH2M Hill; Kathy Stryker Anderson, US Army Corps of Engineers; Keith Abercrombie, Valencia Water Company; Lynn Takaichi, and Meredith Durant, Kennedy Jenks; David Bacharowski, RWQCB; James Leserman, Castaic Lake Water Agency; Steve Cole, Newhall County Water District; Mauricio Guardado, Santa Clarita Water; Neil Elsey, Avion Holdings LLC; Alisa Lacey, Stinson Morrison Hecker LLP; Jeff O'Keefe, Department of Public Health.

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