

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
895 Aerovista Place, Suite 101
San Luis Obispo, California 93401-7906**

**WASTE DISCHARGE REQUIREMENTS
ORDER NO. R3-2011-0224
December 1, 2011**

**FOR THE
WHITTAKER GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
SAN BENITO COUNTY**

The California Regional Water Quality Control Board, Central Coast Region (hereafter Central Coast Water Board), finds that:

PURPOSE OF ORDER

1. Cleanup and Abatement Order (CAO) No. R3-2009-0115 requires Whittaker Corporation (hereafter "Whittaker" or "Discharger") to complete all necessary investigations and remedial actions (hydraulic capture and cleanup) associated with pollution related to the former Whittaker Ordnance Facility located at 2751 San Juan Road, Hollister, CA (Site). Whittaker discharged or permitted the discharge of waste constituents including, but not limited to, volatile organic compounds (VOCs), perchlorate, and hexavalent chromium (Cr VI) to waters of the state, which caused and continues to threaten to cause a condition of pollution or nuisance. These proposed Waste Discharge Requirements Order No. R3-2011-0224 (waste discharge requirements or Order) authorize Whittaker to reinject treated groundwater from their groundwater extraction and treatment system (GETS) as part of their cleanup strategy to capture and treat waste constituents in groundwater consistent with the CAO.
2. Whittaker is currently enrolled in the *General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Highly Treated Groundwater to Surface Water* (General Permit) Order No. R3-2006-0067 for GETS discharge to the San Benito River. The existing GETS has not consistently achieved the NPDES General Permit effluent limits for selenium, and this Order, along with Whittaker's planned GETS upgrades, provides Whittaker a discharge alternative for treated groundwater.
3. In accordance with Section 13260 of the California Water Code, on July 29, 2011, the Discharger filed a Report of Waste Discharge (ROWD). Additionally, the Discharger submitted the following reports to supplement the ROWD: June 3, 2011 *Anti-Degradation Analysis for Reinjection of Treated Groundwater*; July 29, 2011 *Selenium Fate and Migration Analysis*; August 29, 2011 *Addendum to Revised Final Design Report for the Groundwater Extraction and Treatment System*; and September 1, 2011 *Arsenic Fate and Migration Analysis*. The ROWD and supplemental reports support the Discharger's need to operate the GETS to clean up groundwater pollution caused by Whittaker's operations.
4. This Order reflects current groundwater treatment and disposal to land practices, protects the beneficial uses of the receiving water via discharge and receiving water requirements, and is consistent with the State Water Resources Control Board's (State Water Board)

Resolution No. 68-16 "Statement of Policy with Respect to Maintaining High Quality of Waters in California" (Resolution No. 68-16¹).

SITE LOCATION AND DESCRIPTION

5. The Site is located at 2751 San Juan Road in Hollister, San Benito County, on approximately 94 acres. The latitude of the Site is 36° 51' north and the longitude is 121° 26' west. The property is zoned industrial, and is surrounded by farming and ranch land and a cluster of single-family homes (see Figure 1). From 1980 until 1993, Whittaker owned the property (APN No. 021-03-13 and 021-03-17) and operated an ordnance manufacturing business. Whittaker sold the property and business, but retained responsibility for the investigation and cleanup of all waste constituents. Pacific Scientific Energetic Materials recently used a few buildings for various metal conditioning and fusing processes, but does not currently use this Site for their operations. For much of the Site's history, liquid waste from many of the onsite buildings drained to a large septic tank and past operators discharged and/or disposed of wastes in areas around the property including the burn areas, doghouse sump, lower pond, and dry wells. Most of the source areas are adjacent to these features, and are polluted with perchlorate, VOCs, and/or Cr VI.

GROUNDWATER EXTRACTION AND TREATMENT SUMMARY AND BACKGROUND

6. The Central Coast Water Board issued CAO No. R3-2009-0015 on July 31, 2009. CAO No. R3-2009-0015 requires Whittaker to complete characterization, and to clean up soil, soil gas, and groundwater pollution in a phased approach. The phased approach is reasonable because of the complexity of the geology and hydrogeology beneath the Site, the large number of source areas on the Site, and the differing stages of characterization for various onsite source areas. The GETS and permitting of its discharge is essential to Whittaker's cleanup strategy because the GETS can only operate properly if the treated groundwater is continuously discharged. Whittaker's overall cleanup strategy is to first hydraulically capture and treat polluted groundwater along the edge of the Site to prevent additional offsite migration. Once the existing GETS is operational, Whittaker plans to install additional extraction wells and use the GETS to treat offsite and high-concentration onsite groundwater plumes.
7. On July 31, 2006, Central Coast Water Board staff enrolled Whittaker in the NPDES General Permit Order No. 01-134 in anticipation of GETS startup in 2007. However, on December 1, 2006, Central Coast Water Board staff revised the NPDES General Permit ("NPDES General Permit Order No. R3-2006-0067" or "revised NPDES General Permit"). NPDES General Permit Order No. R3-2006-0067 included additional monitoring requirements and effluent limits, which resulted in Whittaker sampling groundwater from its extraction wells for the 126 priority pollutants listed in the California Toxics Rule. The additional sampling demonstrated that groundwater from Whittaker's extraction wells exceeded the allowable effluent limit of 5 micrograms per liter ($\mu\text{g/L}$) for selenium. Although selenium is naturally occurring in groundwater beneath the Site, Whittaker had to redesign the GETS to reduce selenium concentrations to below effluent limits prior to discharging the

¹ A copy of Resolution No. 68-16 (the "Anti-Degradation Policy") is available at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf

treated groundwater to the San Benito River under the revised NPDES General Permit. Even though selenium is both economically and technologically difficult to treat, Whittaker built an innovative bioreactor for selenium removal, and began discharging to the San Benito River in August 2009 pursuant to the revised NPDES General Permit. The GETS was successful in adequately reducing perchlorate, VOCs, and Cr VI concentrations. However, because the treatment system did not consistently reduce selenium to below the effluent limit set forth in the revised NPDES General Permit, Whittaker tried to reduce selenium concentrations in the discharge by managing extraction well pumping rates in the six extraction wells. The GETS did not achieve selenium discharge limits while also maintaining hydraulic capture when Whittaker reduced the pumping rates. Whittaker chose to stop the discharge pursuant to the revised NPDES General Permit in December 2010 to reevaluate selenium treatment options and treated groundwater discharge options.

8. From December 2010 to February 2011, Whittaker assessed and conducted lab studies to improve the treatment capability of the selenium bioreactor. In the August 2011 *Addendum to Revised Final Design Report for the GETS*, Whittaker proposed to upgrade the GETS based on the results from various lab studies and additional operational data collected. The updated selenium bioreactor is an innovative design and has not been fully tested and may have inconsistent treatment capability for reducing selenium concentrations to below the effluent limit of 5 µg/L. Therefore, as a backup plan, Whittaker proposed an alternative discharge option to reinject treated groundwater into Unit 5 beneath the Site in compliance with these waste discharge requirements. Whittaker plans to discharge to surface water if the upgraded GETS consistently achieves the NPDES effluent limit of 5 µg/L, but by obtaining these waste discharge requirements Whittaker will also have the flexibility to reinject the treated groundwater into Unit 5 at a higher effluent limit. This Order allows Whittaker to discharge selenium in treated groundwater with a quarterly average of 16 µg/L and a maximum selenium effluent limit of 20 µg/L. The selenium effluent limits in this Order are based on the lowest applicable *groundwater* water quality objectives whereas the revised NPDES General Permit's effluent limits are based on the *surface water* water quality objective for the protection of aquatic species.
9. The GETS currently consists of granular activated carbon for VOC removal, and bioreactors for perchlorate, Cr VI, and selenium remediation. Whittaker originally installed six wells at the northwestern boundary (i.e., downgradient edge) of the Site to extract polluted groundwater from the Unit 1 and 3 aquifers (locally, Unit 3 is used for agricultural supply). In our September 23, 2011 letter, Central Coast Water Board staff approved the proposed GETS upgrades, which include the following:
 - modify pump and controls in the extraction wells to better control influent flow rate;
 - modify the current bioreactor system, which includes a de-aeration fixed film reactor; and two continuous stirred tank reactors (CSTRs), into a single CSTR to simplify the system and reduce the number of components that require process control;
 - upgrade the electron donor dosage system to improve control of the CSTR;
 - add a continuous, real-time oxidation reduction potential (ORP) monitoring device that automatically puts the GETS in recycle mode when ORP readings are outside performance limits;
 - restart the extraction wells in a phased approach to optimize the treatment system selenium reducing capabilities during bioreactor startup, and determine which wells, and if additional wells, are needed to hydraulically capture polluted groundwater; and

- discharge the effluent into Unit 5 via a new injection well. (Whittaker will discharge to the San Benito River or temporarily to land via spray irrigation pursuant to the revised NPDES General Permit and/or the General Waiver of Waste Discharge Requirements during the phased re-start.)
10. The GETS will discharge continuously for an estimated 20-year timeframe based on predicted time necessary to hydraulically capture and treat impacted groundwater. Whittaker will restart the existing onsite extraction wells in a phased approach (one-by-one), and the estimated total flow, based on past operations and hydrogeologic calculations, is expect to be between 19 to 78 gallons per minute (gpm) (see Table 1). Whittaker plans to install additional extraction wells offsite and onsite (at the Building 5 and 23 area) once the upgraded GETS is operational to more aggressively cleanup groundwater. The flow rates in Table 1 below are estimated based on aquifer properties for each given extraction scenario:

Table 1. Estimated GETS Discharge Flow

Extraction Scenario	Estimated Total Extraction Rate Range (gpm)
Onsite Hydraulic Capture	19 – 78
Onsite & Building 5 and 23 Cleanup	25 – 108
Onsite, Building 5 and 23 Cleanup & Offsite Cleanup	58 – 141

11. Whittaker proposes to reinject treated groundwater into Unit 5 via one reinjection well located on the Site (see Figure 2). Whittaker plans to drill a six-inch pilot borehole and sample and log the well to determine the optimal screen length. Whittaker anticipates Unit 5 will be encountered at a depth ranging from 650 feet to 850 feet below ground surface (bgs). With Executive Officer concurrence, Whittaker will drill the well to a final borehole diameter of 12-inches. Whittaker will connect the reinjection well to the GETS with an approximately 100-foot long subsurface pipeline.

GEOLOGY AND HYDROGEOLOGY

12. Stratigraphy: Whittaker has identified two major stratigraphic units beneath the Facility: 1) alluvial and stream terrace deposits (Q_{al}) in the San Juan Valley on the west side of the Facility, and 2) the unconsolidated Pliocene deposits (P_{uc}) in the Bird Creek Hills, generally on the east side of the Site. The geologic water bearing and non-water bearing units mapped within the P_{uc} include:
- Unit 1 (aquifer) sediments are laterally discontinuous, consisting of clays, silts, and fine-grained sands. Unit 1 is present at the surface of the Site above an elevation of about 240 feet mean seal level (msl).
 - Unit 2 (confining unit) consists of massive silts to lean clays with a thickness between 40 and 80 feet.

- Unit 3 (aquifer) consists of poorly sorted sands and is a high yield quifer found beneath much of the Site and is used as a regional drinking water and agricultural supply aquifer, and ranges in thickness from 10 to 50 feet.
- Unit 3/4 (confining unit) underlies Unit 3 and is similar to, but thinner than, Unit 2.
- Unit 4 (aquifer) consists mainly of sand and is laterally continuous beneath the Site. Like Unit 3, it serves as a regional drinking and agricultural supply aquifer, and is on average 75 feet thick or greater.
- Unit 4/5 (confining unit) consists of silty clay to clay of unknown lateral continuity. Although few wells are drilled deeper than Unit 4, at two different locations Whittaker observed Unit 4/5 to be between 27 feet and 300 feet thick.
- Unit 5 (aquifer) consists of silty and clayey sand from about 700 feet bgs to 1,090 feet bgs. Based on Whittaker's sampling, this unit is naturally of poor water quality and is not currently used for water supply in the Site vicinity.

13. Hydrology/Hydrogeology: The Site is situated over the San Juan groundwater subbasin within the Gilroy-Hollister groundwater basin. The San Benito River bounds the northern portion of the subbasin and is often dry. Groundwater flows generally northwest across the Site, and westerly to southwesterly in the offsite downgradient direction, which is consistent with regional trends. Groundwater elevations are influenced by topography, faults, seasonal recharge, geologic heterogeneities, the Hollister Wastewater Treatment Plant and offsite domestic and agricultural supply well pumping in Units 3 and 4. Whittaker has identified numerous local intermediate and minor faults near and beneath the Site which likely present barriers to groundwater flow and potentially waste constituent transport in some areas and depths, as well as preferential pathways for groundwater transport in other areas.

GROUNDWATER USE AND QUALITY

14. Groundwater Use: This Order considers the influence of the recharge from the treated groundwater reinjection relative to municipal and domestic groundwater use in the area. Regionally, for agricultural, municipal, and industrial supply, the San Benito County Water District (District) estimates that 50% to 70% of their water supply is from groundwater in the Hollister area.² The City of Hollister's municipal wells (which are located over two miles upgradient from the Site) are about 335 feet deep to a maximum of 645 feet deep.

Due to their proximity to the Site, Whittaker monitors five private irrigation and/or domestic supply wells. Recently, most samples have been non-detect for all waste constituents, but a few have had trace to low concentrations of VOCs. Whittaker has provided eight private well users affected by pollution from the Site with replacement supply wells, water treatment systems, bottled water, and/or facilitated the users' connection to water supplied by the City of Hollister. All the nearby supply wells are screened in Unit 3 and/or Unit 4. There are no known wells within at least a two-mile radius of the Site that extract from Unit 5.³ Additionally, it is not expected that wells will be installed in Unit 5 in the near future due to

² Todd Engineers. *Annual Groundwater Report for Water Year 2010 San Benito County Water District*, December 2010.

³ As part of the existing CAO, Whittaker is required to provide an updated well survey every three years with the locations of all private and public wells within about a 1.5 mile radius of the Site. The most recent is: AMEC. *Updated Well Survey*, June 1, 2011.

the poor natural water quality and due to the cost of drilling to the depth of Unit 5 when shallower water (Unit 4) is of better water quality for drinking water purposes.

15. Unit 5 Water Quality: Whittaker installed a Unit 5 well (SW-1) in 2007 as a potential replacement agricultural supply well for a neighboring farmer. However, because the well exceeded secondary maximum contaminant levels (MCLs) (taste and odor objectives) for total dissolved solids (TDS), chloride, sulfate and specific conductance it was never used. Whittaker did not abandon the well, and recently sampled the well to determine background water quality for the anti-degradation analysis (see Table 2 below). SW-1 is located 1,400 feet from the proposed reinjection location. San Benito County Water District staff is aware Unit 5 has poor water quality and discussed with Whittaker staff that there is limited water quality data available at this depth.

Table 2. Background Water Quality at Reinjection Location

		Unit 5 Concentration Range	Unit 5 Concentration Average (Mean)
Manganese, Total	mg/L ¹	0.14 – 0.25	0.17
Selenium, Total	µg/L	0.95 – 1.2	1.1
Arsenic	µg/L	<1 – 1.3	1.1
Hexavalent Chromium	µg/L	<0.50	<0.50
Nitrate as N	mg/L	<0.2 – <0.4	<0.31
Chloride	mg/L	260 – 490	395
Sodium	mg/L	250 – 600	505
Sulfate	mg/L	500 – 1,200	999
TDS	mg/L	1,300 – 2,800	2,527
Specific Conductance	Umhos/cm	2,080 – 4,500	3,637

1. milligrams per Liter (mg/L)

2. Unit 5 data based on depth-discrete samples collected from the only well drilled in Unit 5: SW-1.

16. Waste Constituents in Groundwater: The Discharger monitors over 100 depth-discrete monitoring wells beneath the Site and throughout the San Juan subbasin pursuant to an Executive Officer-approved monitoring plan. Currently, the perchlorate plume extends approximately half- to three-quarters of a mile offsite to the southwest in Unit 1 (see Figure 3). The TCE groundwater plume extends approximately 1,000 feet, while the Cr VI plume⁴ extends approximately 500 feet southwest in Unit 1 offsite. Perchlorate and VOCs are present onsite in Unit 3, but generally do not extend off the property. Perchlorate in Unit 4 extends north towards a decommissioned agricultural supply well approximately 800 feet. Whittaker has detected degradation products of TCE (i.e., cis-1,2-dichloroethene, vinyl chloride) in onsite groundwater, but only in Unit 1, and these VOCs are rarely detected in offsite groundwater in any Unit.
17. Although selenium is not sampled for extensively in the region, published reports exist that demonstrate that it is naturally elevated in the Hollister area. A majority of the wells sampled as part of the City of Hollister's (City) hydrogeologic assessment in 2004 showed detections of selenium at about 2 µg/L to 10 µg/L.⁵ In its Annual Groundwater Report for 2007, the San Benito County Water District reported, for the regional wells with detections,

⁴ AMEC, Geomatrix, Revised Hexavalent Chromium Background Study May 10, 2010.

⁵ Geomatrix Consulting. *Hydrogeologic Report: City of Hollister Hydrogeologic Assessment*, May 2004.

an average concentration of 9 µg/L.⁶ Whittaker sampled its monitoring wells for selenium and found an average concentration of 12 µg/L and 9 µg/L in the Q_{a1}/Unit 1 and Unit 3 aquifers, respectively. Whittaker reported selenium in Unit 5 at concentrations ranging from 0.95 µg/L to 1.2 µg/L. The MCL for selenium is 50 µg/L, and the Central Coast Basin Plan includes a concentration protective of agricultural use of 20 µg/L.

18. Whittaker also detected arsenic in their effluent at a range between 1.6 µg/L to 2 µg/L.⁷ The background concentration, which is based on one sampling event collected from SW-1 at four depth-discrete intervals, ranged between <1.0 µg/L to 1.3 µg/L, with a mean concentration of 1.1 µg/L. The MCL for arsenic is 10 µg/L. Like selenium, many of the regional wells in the upper aquifer units indicate arsenic is present regionally, and is naturally occurring. In the Annual Groundwater Report for 2007, the District reported, for the regional wells with detections, an average concentration of 53 µg/L. In 2004, the City detected arsenic in half of their monitoring wells included in the hydrogeologic assessment at concentrations ranging from 2.0 µg/L to 7.0 µg/L.
19. Nitrate is also present in groundwater beneath the Site, and Whittaker has reported detections in their GETS extraction wells (Unit 1 and Unit 3 groundwater) at concentrations ranging from 6.5 to 35 mg/L with a mean of 12 mg/L (nitrate as N). Nitrate was used at the site for ordnance manufacturing, but no source area has been identified. Nitrate detections may also be indicative of discharges relating to agricultural practices in the area, the neighboring wastewater treatment plant ponds, or the historical land use at the Site, which was a dairy farm. Regardless of the source of the nitrate, one of the advantages of a bioreactor treatment system is that it will treat nitrate to less than detection limits.

BASIN PLAN

20. The Central Coast Water Board adopted the *Water Quality Control Plan, Central Coast Basin* (the Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters within the Region. Present and anticipated beneficial uses of groundwater in the vicinity of the Site include municipal, domestic, agricultural, and industrial water supply.
21. For receiving waters with designated beneficial uses of municipal and domestic water supply, the Basin Plan establishes the primary drinking water MCLs, listed in Title 22 of the California Code of Regulations, Sections 64431 (inorganic compounds) and 64444 (organic compounds), as applicable water quality objectives.
22. The Basin Plan establishes certain water quality objectives for selected groundwaters in the Hollister groundwater basin. These objectives are intended to serve as a water quality baseline for evaluating water quality management in the basin. The median groundwater quality objectives are at best representative of gross areas only. Application of these objectives must reflect the actual groundwater quality present. Whittaker developed site-

⁶ Todd Engineers, *San Benito County Water District Annual Groundwater Report for Water Year 2007*, December 2007.

⁷ Whittaker estimated this concentration range for the GETS with the current six extraction wells pumping. The same concentration range is anticipated in the effluent as new wells are brought online.

specific background concentrations for certain constituents consistent with the Basin Plan, as described in Table 2, Finding No. 15.

GROUNDWATER AND TREATMENT SYSTEM MONITORING

23. Currently, Whittaker is required to sample its' monitoring wells for water levels and waste constituents quarterly, semiannually, or annually pursuant to Monitoring and Reporting Program (MRP) No. R3-2009-0022 (as updated on November 2, 2010). Whittaker will also conduct the following monitoring related to the GETS and the discharge to Unit 5.
- 1) *Performance Monitoring of Hydraulic Capture and Groundwater Cleanup:* Whittaker prepared a May 20, 2009 GETS Performance Monitoring Plan (PMP) in the *Revised Final Design Report for the GETS*, which Central Coast Water Board staff incorporated into MRP No. R3-2009-0022. The PMP includes assessment of hydraulic and chemical data to determine if the extraction well network is preventing offsite migration of waste constituents from the onsite source areas. Whittaker must continue with this PMP monitoring, and may propose changes to this PMP in their Annual Monitoring Report (due January 30th of each year) based on actual pumping response, and as they incorporate additional extraction wells on- and offsite.
 - 2) *GETS Treatment System:* Whittaker has submitted a monitoring plan to sample the GETS influent, midpoints, and effluent to confirm the discharge will meet the effluent limits in this Order. Whittaker must receive Executive Officer approval of this plan prior to discharge. Central Coast Water Board staff already approved supplemental monitoring of the new bioreactor system proposed in the GETS Addendum Report which includes: monitoring bioreactor conditions (nitrate, ORP, and mass flow rate); biomass production, and groundwater elevation in the recharge/injection well versus injection rate.
 - 3) *Treated Water Discharge System:* Whittaker has submitted a monitoring plan to assess receiving water quality (Unit 5 aquifer) to confirm reinjection complies with this Order and confirms Whittaker's predicted selenium and arsenic migration distances. The Executive Officer will approve this plan prior to discharge under separate correspondence. Since Unit 5 is over 700 to 1,090 feet deep, and because Whittaker has demonstrated it is of poor water quality, and will likely not be used in the foreseeable future by the District or agricultural users, Whittaker has proposed limited monitoring of the Unit 5 receiving water. Whittaker predicts that localized selenium and arsenic impacts will extend approximately 300 to 500 feet and 700 feet,⁸ respectively from the Unit 5 injection well; Whittaker will sample SW-1 (located 1,400 feet downgradient of the injection well) to verify this. Whittaker will also be required to monitor well(s) in Unit 4 to confirm there is no upward migration of reinjected treated groundwater from Unit 5 into Unit 4. The Executive Officer may require Whittaker to install additional monitoring wells if there is not sufficient data to confirm the predicted selenium and arsenic migration distances.

⁸ Conservative estimate of the distance the constituent concentration may exist above the background concentration based on GETS maximum pumping rate of 120 gpm for 23 years predicted in Whittaker's Arsenic and Selenium Fate and Migration Analysis.

ANTIDegradation

24. The State Water Board Resolution No. 68-16 states, in part:

Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in best practicable treatment and control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

The proposed discharge by injection of highly treated groundwater as authorized in this Order is consistent with Resolution No. 68-16 because the action will extract groundwater with waste constituents above drinking water standards, and treat the constituents in groundwater to less than detection limits. This proposed treatment constitutes "best practicable treatment or control" because it uses carbon adsorption, bioreactors, and filters to remove wastes, which are considered some of the best available methods to remove the wastes. The Discharger has used the same treatment system effectively for perchlorate, VOCs, and Cr VI removal. The use of this treatment will assure that a pollution or nuisance from these Site-related wastes will not occur since the concentrations of the treated groundwater are below detectable limits.

25. Consistent with State Water Board Resolution No. 68-16, Whittaker conducted an anti-degradation analysis for selenium and arsenic because the discharge concentrations may be greater than the receiving water concentrations for these naturally occurring compounds. (Until pumping starts, Whittaker can only estimate the effluent concentration compared to the background concentration.) Whittaker reported selenium in Unit 5 receiving water at concentrations ranging from 0.95 µg/L to 1.2 µg/L, and anticipates the effluent concentrations will range between 1.7 µg/L to 13 µg/L. The Central Coast Basin Plan agricultural standard is 20 µg/L and the MCL is 50 µg/L. Whittaker anticipates arsenic discharge concentrations will range between 1.6 µg/L to 2 µg/L. The average background concentration in Unit 5, based on one round of multi-depth groundwater sampling, is 1.1 µg/L. The MCL for arsenic is 10 µg/L. Given the treated effluent concentrations, the discharge of the treated groundwater should never result in exceedances of the lowest applicable water quality objective for either selenium or arsenic. Central Coast Water Board staff will review additional background data as Whittaker collects it, and will reconfirm that the effluent limits included in this Order are consistent with Resolution No. 68-16.

26. Some degradation of Unit 5 is consistent with Resolution No. 68-16 because:

- It will not result in a significant reduction in water quality. The increase in selenium and arsenic is spatially localized in extent (confined to a relatively small mixing zone), estimated to be at the most 700 feet from the injection location beneath the Site. Overall water quality may actually improve as a result of the discharge, by reducing localized concentrations of TDS, sulfate, sodium and chloride.
- Whittaker has demonstrated with bench testing and operations, analysis, and upgrades to the selenium bioreactor, that there is no practicable treatment technology available for selenium that can reduce it to concentrations lower than that which Whittaker predicts achieving.

- The Unit 5 aquifer will likely not be used in the near future for domestic or municipal supply because water of drinking water quality is available in Unit 3 and Unit 4, which are at shallower depths than Unit 5 (lower cost for drilling supply well). Also, Unit 5 water is of poor quality (high TDS, chloride, sodium, and sulfate).
- Any water quality degradation that may occur will remain at concentrations below the lowest water quality objective.
- The cleanup of perchlorate, VOCs, and Cr VI, even with some degradation due to selenium, will result in restoring the aquifers to concentrations below drinking water standards and will restore the current beneficial uses of drinking water (municipal and domestic supply) and agriculture to these aquifers.
- Returning treated groundwater to the basin provides for long-term preservation and storage of groundwater resources.

27. The occurrence of selenium and arsenic are unrelated to the Discharger's operations and if the concentrations were not above receiving water concentrations the Central Coast Water Board would regulate the discharge under the *General Waiver of Waste Discharge Requirements Resolution No. R3-2008-0010*, instead of this Order.

28. The discharge regulated by this Order is subject to waste discharge requirements that will result in treatment, control, prevention of pollution and nuisance, and maintenance of water quality.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

29. On December 1, 2011, the Central Coast Water Board approved Resolution No. R3-2011-0227, which adopts the Negative Declaration and Initial Environmental Study (IES) addressing the GETS upgrade and reinjection project in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000, et seq.) and the California Code of Regulations. The Central Coast Water Board is the lead agency for purposes of CEQA. Per CEQA Guidelines section 15070, the Central Coast Water Board approves a Negative Declaration because the project will have a "less than significant impact" or "no impact" for all environmental categories as described in the IES. The Negative Declaration and IES identified that the project will have a "less than significant impact" on air quality, the public (from hazards or hazardous material), hydrology and water quality, and noise. The project will not have a significant effect because it is subject to waste discharge requirements that require use of best practicable treatment or control of the discharge, do not allow any exceedances of applicable water quality objectives, and result in restoring beneficial uses of polluted groundwater. The project is not expected to exceed any Air Pollution Control District emission standards, nor is the project or construction of the project expected to create a significant hazard to the public or the environment. Based on expected project noise levels (including pipeline trenching and well drilling) and because the work will be performed during daytime hours, Whittaker is exempt from noise standards in San Benito County.

EFFLUENT LIMITS

30. This Order contains restrictions on individual pollutants and takes into consideration past, present, and probable future beneficial uses of the receiving waters and environmental

characteristics. Whittaker anticipates the GETS will achieve effluent concentrations less than detection limits for VOCs, perchlorate, Cr VI, and nitrate based on past GETS performance. Based on the Anti-degradation Policy and best available technology, effluent limits for these constituents are non-detect to a limited occurrence of trace detects. Central Coast Water Board staff developed the maximum effluent limitations for perchlorate, VOCs, and nitrate by considering the MCLs and effectiveness of the bioreactor and carbon adsorption technologies. The Cr VI maximum effluent limit is based on the *Revised Hexavalent Chromium Background Study*, while the total manganese effluent limit is based on site-specific background data from SW-1 (see Table 2, Finding 15). Staff established the selenium and arsenic effluent limit considering the best available treatment technology, background water quality, and site-specific data consistent with Resolution No. 68-16.

GENERAL FINDINGS

31. Discharge of treated groundwater is a privilege, not a right, and authorization to discharge is conditional upon the discharge complying with provisions of Division 7 of the California Water Code and any more stringent effluent limitations necessary to implement water quality control plans, to protect beneficial uses, and to prevent nuisance. Compliance with this Order should ensure this and mitigate any potential adverse changes in water quality due to the discharge.
32. On September 12, 2011, the Central Coast Water Board notified the Discharger and interested agencies and persons of its intent to establish waste discharge requirements for the discharge and has provided them with a copy of the proposed Order and an opportunity to submit written views and comments. Interested parties were required to submit comments on the draft Order in writing no later than October 12, 2011; no comments were received.
33. Any person affected by this action of the Board may petition the State Water Board to review the action in accordance with Section 13320 of the California Water Code and Title 23 of the California Code of Regulations, Section 2050. The State Water Board must receive the petition within 30 days of the date of this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request.
34. After considering all comments pertaining to this discharge during a public hearing on December 1, 2011, this Order was found consistent with the above findings.

IT IS HEREBY ORDERED, pursuant to authority in Section 13263 and 13267 of the California Water Code, that Whittaker, its agents, successors, and assigns, may discharge waste from the GETS provided it complies with the following requirements.

All technical and monitoring reports submitted pursuant to this Order are required pursuant to Section 13267 of the California Water Code. The Central Coast Water Board requires these reports to determine compliance with this Order and the impacts, if any, of the discharge on receiving waters. Failure to submit reports in accordance with schedules established by this Order, or failure to submit a report of sufficient technical quality to be acceptable to the

Executive Officer, may subject the Discharger to enforcement action pursuant to Section 13268 of the California Water Code.

A. DISCHARGE PROHIBITIONS

1. Discharge of any wastes to adjacent properties or adjacent drainage ways is prohibited.
2. Bypass of the treatment facility is prohibited and discharge of improperly treated groundwater is prohibited.
3. Discharge to areas other than the Unit 5 injection well is prohibited. (Whittaker may discharge to the San Benito River or temporarily discharge treated water to land for spray irrigation pursuant to other permits, with Executive Officer approval.)

B. DISCHARGE SPECIFICATIONS

1. Daily flow averaged over each month must not exceed 250 gallons per minute.
2. Effluent discharged to the injection well must not exceed the following limitations.

Table 3. Effluent Limits

Constituent	Units	Quarterly Average	Daily Max
Perchlorate	µg/L	Trace detect ¹	6 ²
PCE	µg/L	Trace detect ¹	5 ²
TCE	µg/L	Trace detect ¹	5 ²
cis-1,2-dichloroethene	µg/L	Trace detect ¹	6 ²
trans-1,2 dichloroethene	µg/L	Trace detect ¹	10 ²
Vinyl chloride	µg/L	Trace detect ¹	0.5 ²
Freon 113	µg/L	Trace detect ¹	1,200 ²
1,1-dichloroethene	µg/L	Trace detect ¹	6 ²
1,1,1-trichloroethane	µg/L	Trace detect ¹	200 ²
Cr VI	µg/L	Trace detect ¹	9.4 ³
Nitrate as NO ₃	mg/L	Trace detect ⁴	45 ²
Manganese, total	mg/L	0.17 ³	0.3 ⁵
Selenium, total	µg/L	16 ⁶	20 ⁷
Arsenic, total	µg/L	5 ⁸	10 ²
pH		--	Between 6.5 to 8.3 ⁷

¹ The intent is to treat these compounds to less than the detection limits, based on best available technology. Quarterly average trace detect is defined as a quarterly average with at least 66% of the samples less than the laboratory practical quantitation limit (PQL).

² MCL, which is the Central Coast Basin Plan objective for municipal and domestic supply.

³ Site-specific background concentration.

⁴ Operation of the system is anticipated to treat nitrate to less than detection limits, based on the treatment technology. Quarter average trace detect is defined as a quarterly average with at least 66% of the samples less than the PQL.

⁵ Established at two times the anticipated GETS effluent concentration which allows flexibility during GETS operation to prevent shutting down the system due to a manganese exceedance as new extraction wells are brought on line and the GETS is stabilized.

⁶ Discharger shall optimize the GETS to minimize selenium in the effluent while maximizing waste constituent capture and cleanup. This concentration is based on best available technology treatment effectiveness.

⁷ Lowest Basin Plan water quality objective. For selenium, it is the agriculture water quality objective (which is less than the MCL of 50 µg/L); for pH it is the municipal supply standard.

⁸ From a limited data set, the average background concentration is 1.1 µg/L. However, Whittaker has not collected a significant data set; therefore the average concentration is established at 50% of the Basin Plan Objective (MCL) and slightly greater than the known background.

- Whittaker must notify Central Coast Water Board staff within 48 hours if effluent limit exceedances occur and must immediately shutdown or recycle the water in the GETS.

C. RECEIVING WATER (GROUNDWATER) LIMITATIONS

- The discharge must not cause groundwater to contain concentrations of organic or inorganic chemicals in excess of the limiting concentrations set forth in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 5.5, Section 64444 (organic) and Article 4, Section 64431 (inorganic), unless the background concentrations are greater than these limits.
- The discharge must not cause any constituent to increase in Unit 4 or any other currently used agricultural or domestic drinking water aquifer.

D. PROVISIONS

1. Whittaker must comply with an Executive Officer-approved monitoring plan that evaluates hydraulic capture, treatment system effectiveness, and receiving water quality.
2. Whittaker may add extraction wells and Unit 5 injection wells for the treatment of polluted groundwater and increase the GETS capture and flow, upon approval by the Executive Officer. The Executive Officer may require the addition of monitoring or extraction wells as determined necessary, at any time.
3. Whittaker must maintain an Executive Officer-approved operation and maintenance manual for the GETS operations.
4. This Order may be reopened to address any changes in State or Federal plans, policies, or regulations that would affect requirements for the reinjection of treated groundwater, or as determined necessary by the Central Coast Water Board or the Executive Officer.
5. Pursuant to California Code of Regulations Title 23, Chapter 3, Subchapter 9, the Discharger shall submit a Report of Waste Discharge to the Executive Officer no later than June 1, 2016, addressing: a) whether there will be changes in the continuity, character, location or volume of the discharge; and, b) whether, in their opinion, there is any portion of the Order that is incorrect, obsolete or otherwise in need of revision.

I, Roger W. Briggs, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Central Coast Region, on December 1, 2011.

ORDERED BY: _____
Roger W. Briggs, Executive Officer

Date

ATTACHMENTS

- Figure 1 – Site Location
- Figure 2 – Extraction Wells and GETS Layout
- Figure 3 – Groundwater Plume Map (TCE and perchlorate)

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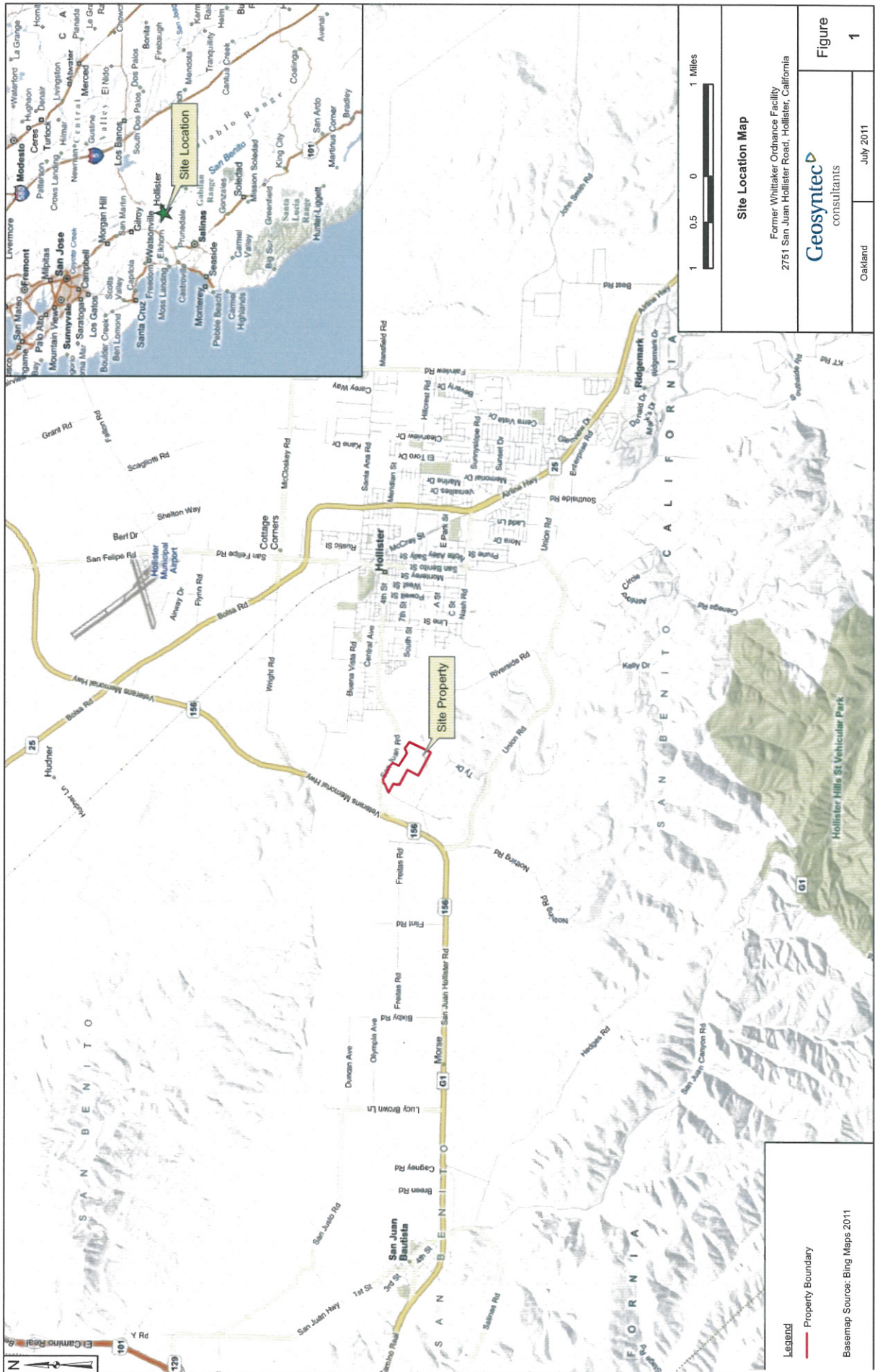


Figure 1. Site Location

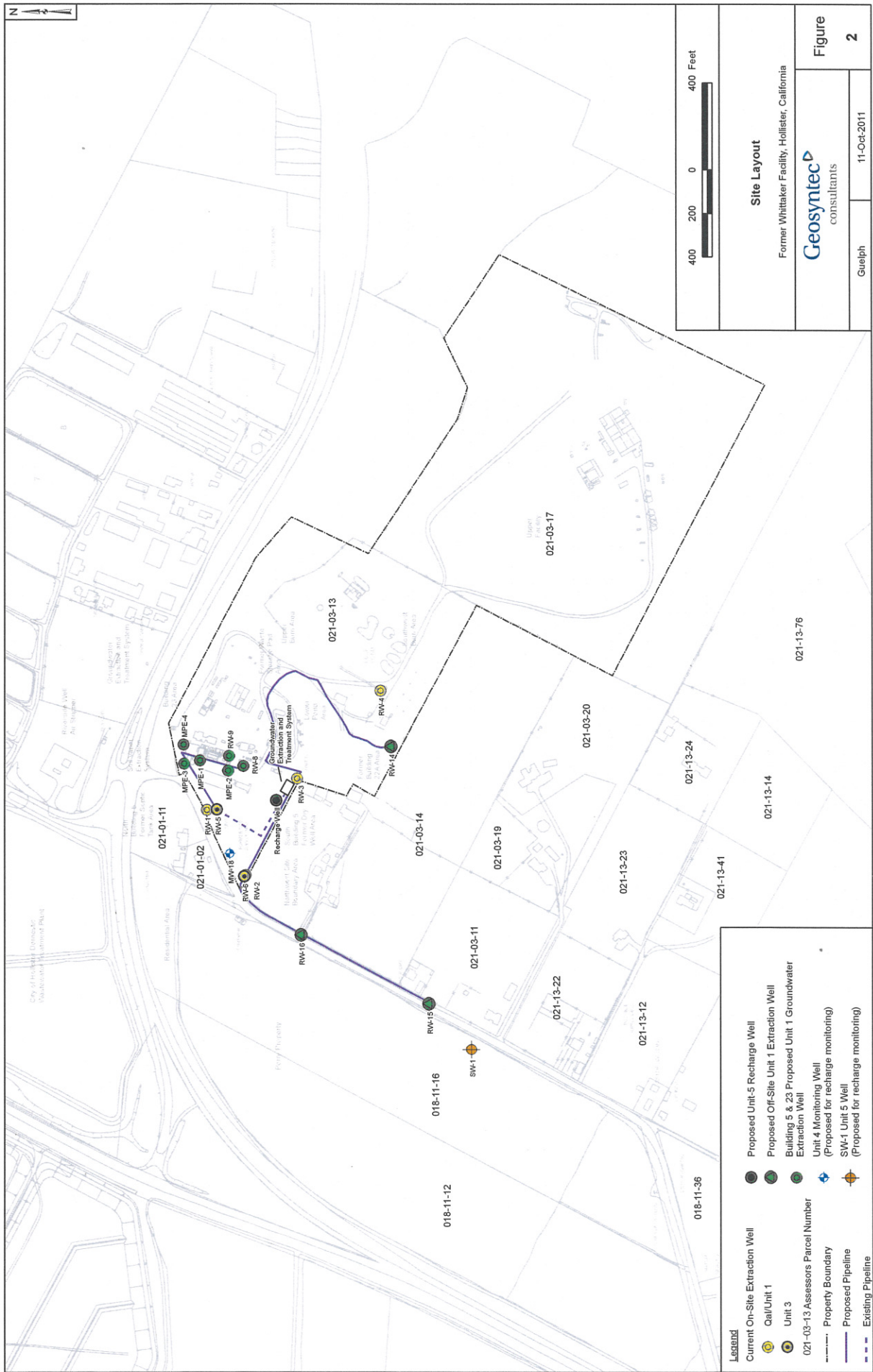
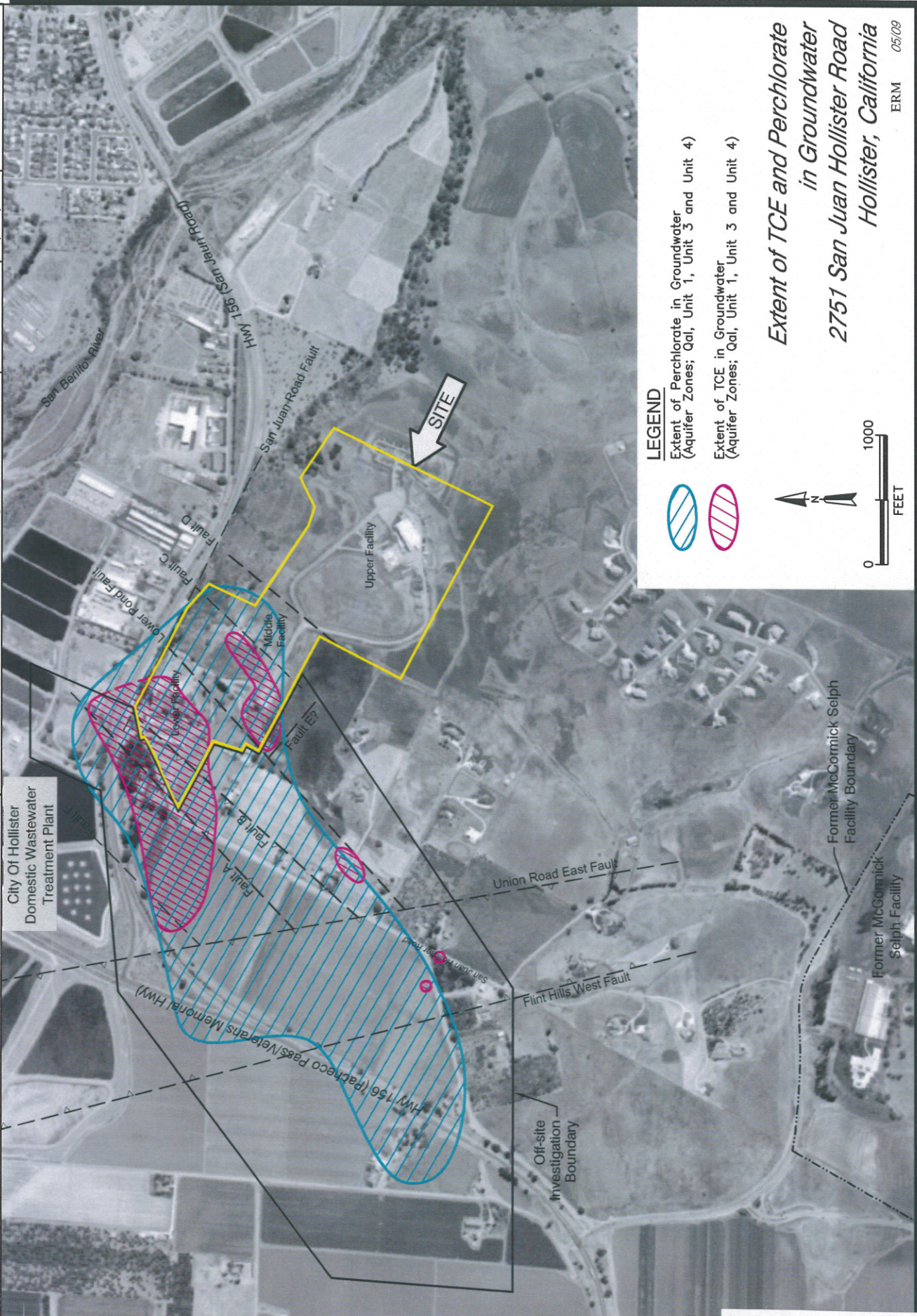


Figure 2. Extraction Wells and GETS Layout

CAD File: g:\0096479\13\009647913-02.dwg
 Drawn By: J. Estrada
 Date: 05/19/09
 Project No. 0096479.13



ERM 05/09

Figure 3. Groundwater Plume Map