Holden, Anne@Waterboards

From: Penny Harper
Sent: Friday, November 02, 2012 10:05 PM
To: Holden, Anne@Waterboards
Subject: Hinkley EIR

Just get the water board draft EIR approved as fast as possible so we can get the Cr6 cleaned out of the Hinkley water as fast as possible. I'd like to live to see clean water coming out of my well.

I am not selling my property to PG&E and intend to live here the rest of my life. I live 5 miles north of the Hinkley School and have 2.3 ppb Cr6 on my well water. I grow vegetables in my garden and fruit trees in my orchard.

Penny Harper, RN

at Aquarius Ranch 
...where Earth meets the Sky

Received 8/29/12

Executive Summary:

This paper refers to the California Regional Water Quality Control Board, Lahontan Region Draft Environmental Impact Report of August 2012 Concerning Chromium Discharges from PG&E's Hinkley Compressor Station.

It discusses the status of the Ch[VI] plume contaminating the Hinkley Valley Aquifer and recommends use of Powell Water Electrocoagulation (EC™) as a more rapid (4-years with 1.200 GPM or 1.8-year with 2,400 GPM EC™ train options) affordable ($ 6.86 million budgetary estimate) alternative to the 250 GPM chemical reduction/precipitation ex-situ treatment described in Alternative 4C-5 of the Draft EIR.

The small physical and environmental footprint of two to four 600 GPM EC™ treatment trains, each packaged in and operated from a transportable 40' ISO container not including costs for extraction wells. Pump stations, facilities for injection of carbon for in-situ groundwater treatment, transfer piping and injection wells,

EC™ effluent would be pumped to injection wells along the western boundary of the plume and at the northern end of the plume. The short (10 to 150 second) EC™ treatment times could allow up to 10 times that of the 250 GPM chemical reduction/precipitation treatment system.

A 250 GPM removal of Ch(VI) from the plume core over 20-years would permit additional Ch[VI] to flow into the aquifer allowing it to contribute to plume growth over the near term and increase requirements for in-situ remediation over the long term.

Powell Water EC™ equipment is installed in 150 facilities worldwide and provides a proven and affordable Cr(VI) remediation capability.

A 24' x 8' Powell Water Treatment (fifth wheel) trailer could be made available for 2-3 months of EC™ demonstration to support Water Board evaluation of options concerning implementation of Alternative 4C-5.

Dan Hendrickson, BSME, MS Management.
President

Plume Area

As described in Chapter 1, of th Water Board Report Introduction, the Water Board requires PG&E to monitor and report on the concentrations of total chromium (Cr[T]) and Cr[VI] present to establish the extent of waste chromium in groundwater. PG&E has sampled for Cr[T] and Cr[VI] contamination levels for many years by installing monitoring wells throughout the project area. Monitoring activities consist of sampling of groundwater and soils (i.e., collection of groundwater and soils for testing) and water level readings. Data collected during sampling is used to determine the geographical variance in contamination levels that is then used to develop boundaries to represent the presence of Cr[T] and Cr[VI] contamination. The maximum extent of these boundaries is characterized as the plume area and the groundwater contours for different levels of contamination are depicted on plume maps. At present, the plume maps depict contours representing Cr[VI] concentrations of 3.1 parts per billion (ppb, essentially equivalent to micrograms per liter) (Figure 2-2b), 10 ppb (Figure 2-2c), and 50 ppb (Figure 2-2d). These concentrations were mapped for the following reasons:

Figure 1 shows the Hinkley Valley aquifer plume area

3.1 ppb for Cr[VI] This (Dashed Green) contour traces the outer boundary of what is defined as the chromium plume in groundwater as of the Fourth Quarter 2011. The 3.1 ppb value for Cr[VI] was determined based on a 2007 Background Study Report conducted by PG&E that evaluated background levels of Cr[T] and Cr[VI] in areas that were then outside the recognized plume area. The results of that study estimated that maximum background levels were 3.1 ppb for Cr[VI] and 3.2 ppb for Cr[T] and ***the average background levels were 1.2 ppb for Cr[VI] and 1.5 ppb for Cr[T]*** (Pacific Gas and Electric 2007). The *Water*

Fig 1, Hinklyy Valley Aquifer CH(VI) Plume Contours

Board will use these values as cleanup targets for the remediation unless and until new evidence is developed that background levels are different than these cleanup targets or PG&E demonstrates that background levels of water quality cannot be restored, at which time the Water Board will identify the best water quality achievable, consistent with the procedures set forth in State Water Resources Control Board Resolution 92-49 (described in detail in Section 2.5 of the Draft IR).

10 ppb for Cr[VI] – This (Solid Green) contour defines the portion of the plume where medium-level concentrations occur. The 10 ppb level is not tied to a regulatory level or a background level.

50 ppb for Cr[T] or Cr[VI] – This (Blue)contour defines the portion of the plume wherein Cr[T] orCr[VI] concentrations are at or above the California Maximum Contaminant Level (MCL) of 50 ppb for Cr[T], which includes Cr[VI]. The MCL is the current drinking water standard and is only specified for total chromium, not hexavalent chromium. Since initiating monitoring activities, PG&E has prepared quarterly groundwater monitoring reports (GMP) in accordance with Water Board orders that have been used to track the area of contamination. GMPs are also used as a means to determine effectiveness of remediation activities being implemented as well as their ability to meet interim remedial targets. In sampling from monitoring wells conducted between 2006 through the second quarter of 2010 (Q2 2010), a level of 4.0 parts per billion (ppb) was used to delineate the extent of the plume area. ***Subsequently, the 3.1 ppb Cr[VI] and Cr[T] levels have been used to delineate the extent of the plume area.*** Figures 2-2b through 2-2d of the Draft EIR refers.

Model Simulation of In-Situ Remediation Zone Treatment Areas

Figure 3.1-13, Section 3.1 Water Resources and Water Quality, shows a diagram of the two different types of In-situ Remediation Zones that can be used to help understand the in-situ remediation zone monitoring results from the 2005 pilot testing and full-scale in-situ remediation zone areas (Central, Source, and SCRIA) within the Hinkley chromium plume. This conceptual model was used to better understand information, such as what the 3D groundwater flow (MODFLOW) and chemical transport model (MT3DMS) would calculate within a representative model cell. The size of the conceptual model example cell was an acre with a time-step of a month for a year. This allowed the change in groundwater flow and Cr[VI] concentrations within the example cell to be tracked for a39 year, to understand the likely effects of different in-situ remediation zone designs with various assumed aquifer properties. As described previously, model assumptions for the Hinkley Valley groundwater flow in the upper aquifer include a saturated thickness of about 75 feet, with a porosity of about 20% and a hydraulic conductivity of about 50 ft/day (1,520 ft/month). There is a regional groundwater elevation gradient of 20 ft/mile, which indicates a northward water tracer movement of about
1 ft/day through the aquifer thickness. This regional water movement through the one acre example cell (about 210 feet wide)can be specified as a regional flow rate (15 gpm based on model assumptions). The in-situ remediation zone cell would include some injection of carbon-amended water into the cell, which is specified as an injection rate (gpm). These flow parameters will provide the basic aquifer movement and pumping rate required for in-situ remediation zone treatment within the cell. A higher regional flow will move the plume faster, but will require increased carbon injection pumping to create the necessary chemical conditions to cause the Cr[VI] to be reduced and precipitate as Cr[III]."

The highest concentrations of Cr[VI] remain below the Compressor Station evaporation ponds suggesting that not all of the water in the aquifer is moving north with the groundwater elevation gradient (regional flow). Some portion of the aquifer porosity is trapped behind clay layers or lenses that prevent movement in this portion of the aquifer. For the conceptual model, half of the porosity (10%) will be assumed to be mobile (water moving with the groundwater gradient) and half will be assumed to be immobile (trapped within the aquifer matrix). The water between these two porosity units will exchange (mix) at a specified rate (% of the mobile volume mixing with the immobile volume each month). The conceptual model will track the Cr[VI] concentration and the injected carbon concentration, which will can be used to indicate reduced chemical conditions within the one-acre example cell. The Cr[VI] in the mobile porosity will be transported by the regional groundwater flow. The injection flow will replace some of the regional flow from the south. The Cr[VI] in the immobile porosity will slowly exchange with the mobile porosity, and will cause the concentrations of Cr[VI] in the cell to remain higher than if the entire cell porosity was mobile and being moved and diluted by the regional groundwater flow.

Assuming the above transport model is correct, use of ex-situ EC™ treatment to reduce Cr [VI] concentration to < 1.5 ppb before mixing carbon into the water for in-situ treatment and injecting this treated water into the northern end of the plume at the 10 ppb boundary where it would dilute and provide in-situ treatment for Cr [VI] concentrations between 1.3 ppb and 10 ppb.

2010 Feasibility Study Addendum 3 (September 2011)

Following review of Feasibility Study Addendum 2, the Water Board solicited input from the California Department of Toxic Substances Control (DTSC) and the U.S. EPA on the 2010 Feasibility Study, Feasibility Study Addendum 1, and Feasibility Study Addendum 2. Based on this input and review, the Water Board requested PG&E to develop further options to implement a program that maintained maximum year-round pumping and plume containment, evaluated the need for and effectiveness of varying pumping schedules, further evaluated the potential for additional cleanup time-frame reduction from that estimated under Alternative 4B, developed milestones for cleanup of different parts (or "operable units") of the plume, developed optimization periods to facilitate adaptive management of the remedial activities, and established a contingency plan to maintain year-round plume capture. Optimization refers to changes that would be made in the remediation system configuration (e.g., change extraction well locations) to maximize remediation as plume cleanup progresses and the plume shape changes.

In response to the Water Board's request, PG&E developed four additional alternatives as part of Feasibility Study Addendum 3 (Pacific Gas and Electric 2011c) that used the same general remediation technologies as the previously studied Alternative 4B with the addition of extraction/treatment features and increases to extraction flow rates, continuous year-round pumping for enhanced year-round hydraulic control, winter-crop agricultural unit operation, and the consideration of winter water treatment by an ex-situ (above-ground) treatment plant. The purpose of the ex-situ treatment approach is to maintain fixed rate, year-round extraction rates since the agricultural units have a reduced capacity to treat water on a per-acre basis during winter months when less water can be absorbed. The additional alternatives were:

Alternative 4C-1. In-situ and enhanced agricultural treatment, including additional extraction wells and agricultural units (AU) and associated infrastructure with higher extraction rates. Only one crop would be used for each agricultural treatment unit, resulting in seasonal fluctuations in flow rates. *Estimated time to cleanup to 3.1 ppb Cr[VI]:* ***40 years***

Alternative 4C-2. Same in-situ and enhanced agricultural treatment as Alternative 4C-1, except a winter crop would be added to increase extraction rates in winter relative to Alternative 4C-2. *Estimated time to cleanup to 3.1 ppb Cr[VI]:* ***39 years***

Alternative 4C-3. Same in-situ and enhanced agricultural treatment as Alternative 4C-2 with operations during summer and winter and the addition of ex-situ treatment with additional injection wells to accommodate the excess flow from the agricultural units in the winter in order to maintain a continuous extraction flow year-round. *Estimated time to cleanup to 3.1 ppb Cr[VI]:****36 years***

Alternative 4C-4. Same in-situ as Alternative 4C-2 with substantially expanded agriculture operations occurring during summer and winter, with addition of new agricultural units for winter-only operations in lieu of ex-situ treatment in order to maintain continuous extraction flow year-round. *Estimated time to cleanup to 3.1 ppb Cr[VI]:* ***29 years***

After review of Feasibility Study Addendum 3, the Water Board recommended development of a more aggressive combined alternative that approximately matched the cleanup timeframe of Alternatives 4C-1 through 4C-4 while providing for removal of chromium from the aquifer in the high concentration portion of the plume. PG&E developed a new "Alternative 4C-5" in March 2012 to respond to the Water Board's recommendation.

Alternative 4C-5. This alternative combines the in-situ and land treatment approaches proposed under Alternative 4C-2 with ex-situ approaches proposed under the previous Combined Alternative to remove chromium from the overall site from the high concentration portion of the plume. *Estimated time to cleanup to 3.1 ppb Cr[VI]:* ***50 years***

<u>Above-ground Ex-situ Treatment</u>.
Above ground (ex-situ) treatment includes various physical-chemical and biological treatment processes that can be used to treat extracted groundwater containing chromium. The treatment process options include liquid-phase treatment to reduce toxicity, mobility, or mass of chromium in groundwater prior to reuse/injection. The physical-chemical methods that can be used to remove chromium from groundwater include chemical reduction/precipitation, electrochemical precipitation, coagulation/microfiltration, ion exchange, and reverse osmosis.

In general, chemical reduction/precipitation treatment is implemented by mixing treatment chemicals with the water stream to promote a reduction/oxidation (redox) reaction. Redox reactions involve the transfer of electrons from one compound to another. Specifically, one reactant is oxidized (loses electrons) and one is reduced (gains electrons). For the case of Cr[VI] treatment, the chromate ion would gain electrons and be reduced to Cr[III], and iron would lose electrons and be converted from Fe2 to Fe3. Reducing agents most commonly used for treatment of Cr[VI] are ferrous sulfate, ferrous chloride, sodium bisulfite, and sodium hydrosulfite. Redox chemicals must be added in quantities greater than the stoichiometric ratio because the chemicals will be consumed by other oxidized chemicals.

Unit processes for chemical reduction/precipitation systems for chromium removal typically include a reactant feed system, reaction (reduction) vessel, aeration tank for oxidation of excess iron, filtration system, and solids handling equipment for dewatering and disposal of precipitated materials. The technology has been proven effective for chromium removal in both bench and full-scale applications, has been implemented at a number of similar sites for groundwater treatment, and could be implemented at the Hinkley site. The process does generate a chemical waste sludge that will require disposal, possibly as a hazardous waste (Pacific Gas and Electric 2010).

Reduction and precipitation of Cr[VI] from groundwater involves at least two reactors. The ferrous iron reduction process is typically carried out with two reactors in series, the first for Cr[VI]reduction and the second, an aerated reactor to oxidize residual ferrous iron to the insoluble ferric state. Flocculants to aid settling of the Cr[III] and Fe3 are added. The precipitated solids containing Cr[III] and Fe3 hydroxides are removed by media filtration. Filter backwash is collected in a large tank where solids are settled, and clear liquid decanted for reuse/disposal.

There are generally two major limitations for surface treatment of Cr[VI] pumped from groundwater. The treatment capacity needed to treat the Hinkley plume within a reasonable time would be relatively large. Because there is an estimated volume of about 7,500 acre-feet with concentrations of greater than 50 ppb, a facility with a capacity of 250 gpm would pump and treat about 400 acre-feet per year, requiring 20 years to pump and treat the plume core (> 50 ppb).

A facility with a capacity of 1,000 GPM would still require five years to pump the existing plume core (> 50 ppb) volume. The second limitation is that it is difficult to pump all of the contaminant from the groundwater, because of immobile porosity zones within the aquifer material. The Hinkley Source Area monitoring wells suggest that this is a characteristic of the chromium plume. Therefore, pumping several times the existing plume volume may be required to remove the majority of the Cr[VI] from the plume core. Pumping several times the core plume volume would require many more years. The sludge would likely be considered a toxic waste and would need to be disposed of in an appropriate landfill facility.

However, unlike agricultural land treatment and in-situ operations, above-ground ex-situ treatment would remove highly concentrated Cr[VI] at the plume core where > 1,000 ppb concntrations remain and could significantly reduce the amount of contamination that over time could significantly spread the plume with hydraulic action thereby increasing the area cost and time required for in-situ remediation in the Hinkley Valley aquifer.

Powell Water is the industry leader and the world's largest supplier of industrial electrocoagulation (EC) systems with over 150 installations worldwide. EC has become recognized as a very effective means for economically treating a wide variety of challenging water treatment applications:

The Powell Water EC™ System has distinct advantages over other ex-situ treatment:

1. *No Process Chemicals Required* - The treatment process requires no chemicals. The EC™ system is periodically cleaned with an acid solution that is recycled.

2. *Nominal Operator Requirements* - Even the largest systems can be operated with only

1 or 2 operators. Operator training is straightforward. The simple design ensures the system is very reliable and cannot be damaged by operator error or process upset.
3. *Low Capital Cost* -

4. *Low Operating Cost* – Besides manpower, the only operating costs are power and periodic electrode replacement. Power consumption is typically 4 kWh/1,000 gallons and electrode consumption is about 0.20 lb./1000 gallons.

5. *Minimal Maintenance* – Maintenance is limited to periodic replacement of the flat blade electrodes which consist of generic 1/8" seel plate that can be purchased locally

6. *Minimal Waste Disposal* – ***Most contaminants are precipitated as oxides which renders them non-hazardous and able to pass the TCLP.*** Since no additional chemicals are added, the waste volume is minimal (~ 0.02% by volume) and can typically be discharged to dumpsters for haul-off or on site landfill. In the Hinkley Valley Cr[VI] Plume remediation, a clarifier for separation of solids and their disposal in a landfill would not be required unless the EC™ train effluent is to be used for Title 22 non-potable water or potable water as is done on the 10 GPM Powell Water Trailer developed for Hurricane Katrina relief. The solids produced by EC™ treatment is stable Iron-Chromium Oxide (iron ore) and presents itself in small grains that would be filtered by the soil surrounding injection wells or the surface as is done with a leach field. Figure 1 shows the 24' long x 8' wide Powell Water Trailer.

7. *Treats a Wide Range of Contaminants* – Minimal, if any, pretreatment is required for a system effective on a broad range of items including suspended solids, colloidial solids, Emulsions, fats, grease, bacteria, viruses, heavy metals, hardness, silica, boron, Selenium, and organics.

Figure 2 shows 600 GPM Powell Water Treatment Train

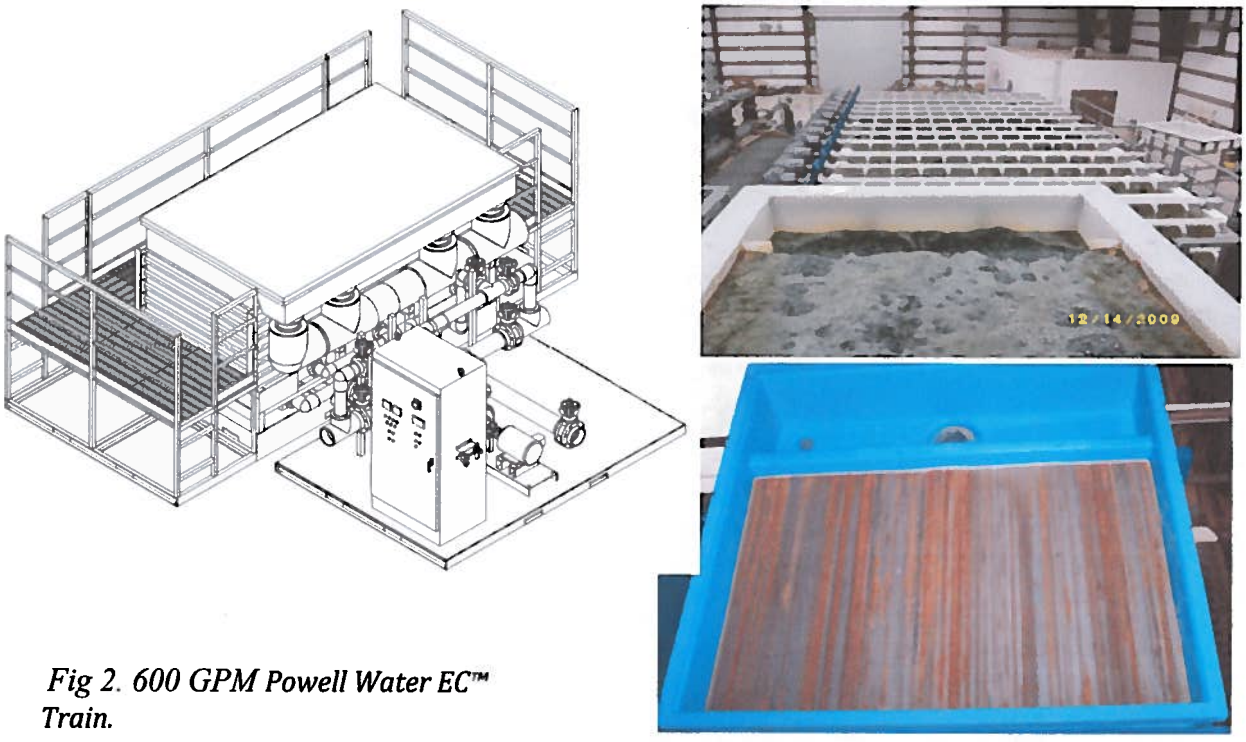


Fig 2. 600 GPM Powell Water EC™ Train.

A primary advantage of the EC™ process is high removal of contaminants (96% for CH(VI) and 99% for CH(T)) with no chemical additions other than those required for pH adjustment and cleaning, minimum waste produced, low power, nominal manpower and a small *footprint* compared to chemical treatmnt. Ease of control to adapt to varying water treatment flow rates and changes to influent water quality. Moreover, EC™ treatment causes toxic metal contaminants (< 0.1% by volume) to form non-soluble oxides that do not require separation from the EC™ effluent. This allows a 600 GPM treatment train to b housed in a transportable 40' ISO container with a possibility of also including pump station controls in th same container.

An estimated 7,500 acre-feet of contaminated water would be:

1. Extracted from within the highest concentration contour of Ch[VI] (***from 50 ppb at the plume contour to 3,500 ppb at the plume core***),
2. Treated with ex-situ remediation,
3. Treated with carbon (methane) to facilitate in-situ treatment, and
4. Injected along the least concentrated plume area between the 10 ppb plume and the 3.1 ppb plume boundaries to the north adjacent to irrigation wells for alfalfa cultivation.

The hydraulic flow gradient within the more highly concentrated parts of the plume (> 10 ppb) would be reduced, thereby reducing plume mobility to the north.

Moreover, over time as plume core concentration is reduced, the EC™ treatment time (96% reduction of Ch[VI] concentration per minute of EC™ treatment time) can also be reduced, allowing a greater volume of water from the plume core to be treated.

Table 1 shows EC™ treatment time, reduction in concentration and flow assuming:

1. The plume volume is 7,500 acre-feet

2. Cr[VI] concentration ranges from 3,500 ppb at the plume core to 50 ppb at the plume perimeter, and

3. The EC™ system would initially treat the core with a 150 second residence time and 460 GPM production, would achieve < 50 ppb throughout the plume in 2.8 years, would reduce EC™ treatment time to 58 seconds and flow rate to 1177 GPM. Increase production flow exponentially to 7,056 GPM to achieve a 3.1 ppb Ch(VI) concentration throughout the 7,500 acre-foot plume volume after 4-years.

Table 1. EC™ Flow, Ch[VI] Concentration, EC™ Treatment Time/Effluent ppb vs. Years

Years	GPM	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	EC™	Days
0.07	461	3500	3.2	2.9								96%	25
0.27	576	1000	3.2		1.6							96%	98
1.35	922	100	3.2			3.0						96%	491
1.16	1176	50	3.2				2.0					96%	423
0.48	1304	21.2	3.2					3.2				96%	173
0.43	1440	14.1	3.2						3.0			96%	157
0.15	2016	7.1	3.2							3.1		96%	56
0.04	7056	3.5	3.2								3.0	96%	16
		1.8	3.2									Totals	
3.94	Years	Acre Feet Treated		50	250	2000	2200	1000	1000	500	500	7500	AF
		Treatment Time - Days		25	98	491	423	173	157	56	16	1440	Days

Figure 3 shows a diagram of the groundwater extraction, EC™ treatment, pumping into an insertion well at the north end of the plume and the hydrodynamic effects of water extraction and insertion in reducing aquifer flow to the north.

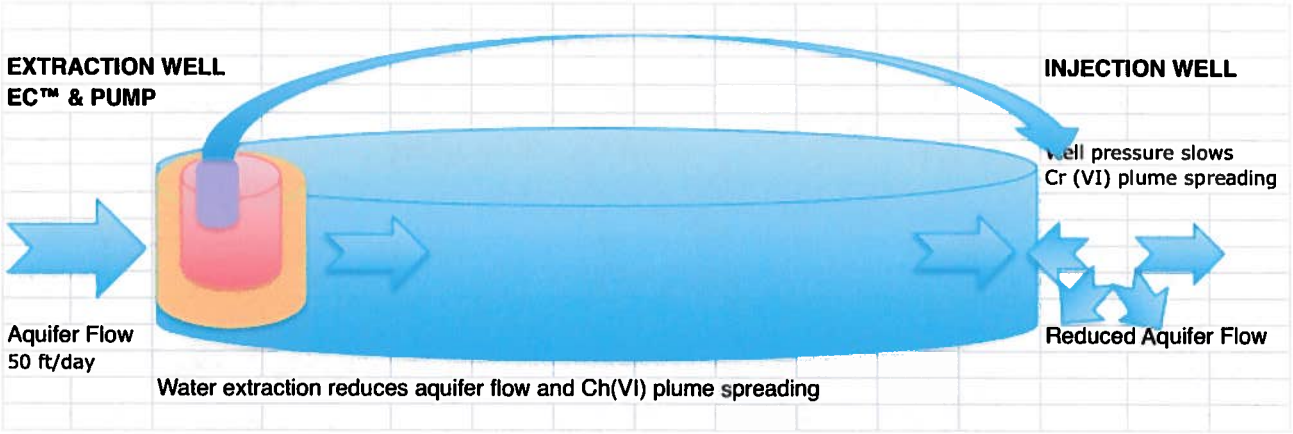


Fig. 3. Extraction, EC™ Treatment and Insertion of Plume Water into the Aquifer

The EC™ train effluent concentrations highlighted in blue show the ppb of Ch[VI] that would be produced with the corresponding EC™ train treatment times and flow rates. The 7,500 af of primary plume having a Ch[VI] concentration of 50 ppb at its perimeter and increasing to 3,500 ppm at its core could be reduced to an average of 3.1 ppb in 4-years.

EC™ reduces Ch[III] at 99.5% per minute of treatment allowing Ch[III] levels to be reduced below 1.5 ppb in about 2.5 years.

The EC™ flow increasing to 7,016 GPM during year 4 would provide 5 x the water volume proposed for in-situ remediation with carbon during a 4-year timeframe.

The EC™ train is expected to remove 257 (dry) gallons of Ch[VI] in 4 years while the Hinkley Valley aquifer flow is expected to spread 62 (dry) gallons of Ch[VI] into the 10 ppm and 3.5 ppm plumes to the north during the 4-year EC™ ex-situ treatment period. This additional spreading of concentrated plume contamination can be reduced/offset by:

1. Increasing the volume of EC™ treated water, and possibly

2. Increasing the amount of in-situ treatment

Doubling the EC™ train capacity to 2,400 GPM would reduce remediation time to 1.8 years and would reduce the increase in plume volume by 55% with a $ 2.8 million increase in EC™ capital costs and a $ 0.3 million decrease in O&M costs for a net increase of $ 2.4 million in total costs. This increase in EC™ train and in-situ remediation flows could conceivably reduce total remediation costs while resolving the plume in 4-years rather than the 50 year schedule and $ 171 million cost of Alternative 4C-5.

If the amount of EC™ treatment is equal to the agricultural irrigation demand to the west, north and east of the plume it may be possible to reduce spreading of the plume.

The use of two 600 GPM EC™ trains to treat the 7,500 acre-foot with 50 ppb to 3,500 Ch[VI] plume concentration to:

1. Reduce the Ch [VI] plume concentration to 3.2 ppb in ~ 4 years with a 1,200 GPM EC™ or in 1.8 years with a 2,400 EC™ train, and

2. Produce up to 100,000 GPD of potable water for 200 Hinkley homes and the school.

Since the EC™ process transforms toxic metal contaminants into benign, non-soluble metal oxides that meet the TLCP, there is no need for clarification of EC™ train effluent before re-injecting it into injection wells or surface within the plume boundaries.

If EC™ flow is doubled, the time required for plume cleanup would be reduced from 4-years to 1.8 years, and the spreading of the 50 ppb plume would be decreased by ~ 55%. Table 2 shows a 1.8-year plume remediation timeline using four 600 GPM EC™ trains that would be 54% faster than the 4-year timeline provided with two 600 GPM EC™ trains.

Table 2. 1.8 Year Ch[VI] Plume Remediation Timeline with Four 600 GPM EC™ Trains

Time	EC™	Plume	Remediation	150 sec	120 sec	75 sec	60 sec	53 sec	48 sec	35 sec	10 sec	60 sec	
Years	GPM	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	EC™	Days
0.03	922	3500	3.2	2.9								96%	12
0.13	1152	1000	3.2		1.6							96%	49
0.67	1843	100	3.2			3.0						96%	246
0.58	2352	50	3.2				2.0					96%	212
0.24	1304	0.0	3.2					0.0				96%	87
0.05	2880	0.0	3.2						0.0			96%	18
0.08	4032	0.0	3.2							0.0		96%	28
0.02	14112	0.0	3.2								0.0	96%	8
		0.0	3.2									Totals	
1.81	Years	Acre Feet Treated		50	250	2000	2200	1000	1000	500	500	7500	AF
		Treatment Time - Days		12	49	246	212	87	18	28	8	659	Days
Gallons of Ch(VI) removed with EC™				57.0	81.5	68.4	35.8	0.0	0.0	0.0	0.0	242.7	Gallons Cr(VI)
Gallons of Ch(VI) carried by aquifer				7.7	9.4	9.2	4.2	0.0	0.0	0.00	0.00	30.5	Gallons Cr(VI)

Alternatively, after 61 days when the concentrated Ch(VI) part of the plume core (3,500 ppb and 1,000 ppb) has been treated, one or two of the 600 GPM EC™ trains could leapfrog up to a mile downstream from the core allowing them to recover most of the contamination carried away from the core by aquifer flow during the initial EC™ treatment. Table 2 shows only 30.5 gallons of Ch(VI) would be lost to the aquifer flow vs. 62 gallons in Table 1.

Four 600 GPM C™ trains could provide 10 x the 250 GPM in-situ treatment rate discussed in Alternative 4C-5 over 1.8-years of treatment. This could increase the rate and effectiveness of plum containment du to the hydraulic flows shown in Figure 2 and could also deploy 10 x more carbon for in-situ plume remediation.

Each 600 GPM EC™ train would be packaged into a 40' long x 8' wide x 9' high ISO container allowing it to have a small physical and environmental footprint compared to an ex-situ chemical coagulation treatment system.

Table 3 shows O&M costs and capital expenses for to and for 600 GPM EC™ trains.

Table 3. Alternative 4C-5 Modifications to use Powell Water EC™ with 4-year and 1.8-year remediation

Remediation of 7,500 AF 50 ppm Ch(VI) Plume in 4 years								
O&M Expense								
Ex-Situ Treatment	**GPM**	**GPY**	**kWh/yr**	**kWh Cost/yr**	**Labor**	**Electrodes**	**Maintenance**	**O&M Cost/yr**
Flow IRZ	1128	592876800	2371507	$ 118,575	$ 58,400	$ 55,480	$ 28,758	$ 261,214
Extraction Wells	20	kW	270.72	@ $ .05/kWh				
Injection Wells	90	1820	Acre-Feet/year					
	1128		2371507	$ 118,575	$ 58,400	$ 55,480	$ 28,758	$ 261,214
4-year O&M costs with 3%/year cost escalation								$ 1,108,486
Capital Expense								
1,000 GPM EC™ = 7-year treatment								
2 x 600 GPM EC™ Train Installed Cost								$ 2,875,826
2 x 40' ISO containers								$ 12,000
2 x Coolrado M50 Air Conditioner								$ 15,000
Shipping								$ 5,000
Project Management/Engineering								$ 50,000
Total 1,000 GPM EC™ Capital Costs								$ 2,957,826
								$ 1,108,486
Total 7,500 Acre-Foot 50 ppm Ch(VI)plume 4-year EC™ ex-situ treatment cost								$ 4,066,312
Doubling EC™ flow to 2,400 GPM with 1.8-year EC™ treatment vs. 4-year treatment								
O&M Expense								
Ex-Situ Treatment	**GPM**	**GPY**	**kWh/yr**	**kWh Cost/yr**	**Labor**	**Electrodes**	**Maintenance**	**O&M Cost/yr**
Flow IRZ	2256	1185753600	4743014	$ 237,151	$ 58,400	$ 110,960	$ 57,517	$ 464,027
Extraction Wells	20	kW	541.44	@ $ .05/kWh				
Injection Wells	90	3640	Acre-Feet/year					
	2256		4743014	$ 237,151	$ 58,400	$ 110,960	$ 57,517	$ 464,027
1.8-year O&M costs with 3%/year cost escalation								$ 857,767
Capital Expense								
4 x 600 GPM EC™ Train Installed Cost								$ 5,751,652
4 x 40' ISO containers								$ 24,000
4 x Coolrado M50 Air Conditioner								$ 30,000
Shipping								$ 10,000
Project Management/Engineering								$ 50,000
2,000 GPM EC™ System Capital Costs								$ 5,865,652
2,000 GPM EC™ System 1.8 year O&M Costs								$ 857,767
Total 50 ppm 7,500 af plume 1.8-year EC™ ex-situ treatmnt cost								$ 6,723,419
Cost difference between 1.8-year and 4-year treatment timeframe								$ 2,657,107
100,000 GPD EC™ Potable Water Supply Upgrade								
O&M Expense								
Hinkley H2O 1,000	69	36500000	146000	$ 7,300	$ 29,200	$ 3,929	$ 1,867	$ 42,296
		112	Acre-Feet/yea	3.1%	of 2,400 GPM EC™ Option			
1.8-year O&M expense with 3%/year escalation								78,186
Capital Expense								
70 GPM Atmospheric Clarifier								$ 25,200
Filter								$ 30,000
Sterilization								$ 50,000
RO Skid								TBD
SCADA								$ 27,000
Total 100,000 GPD EC™ Potable Water Upgrade Capital Cost								$ 132,200
								$ 78,186
								$ 210,386
Total Costs with Potable								$ 6,855,619

Table 3 shows O&M and Capital Costs for the 1,200 and 2,400 GPM C™ options as well as the incremental cost of adding a 100,000 potable water treatment capability to an EC™ train. operating parameters, power, labor and electrode replacement estimated to be $ 288,187/ year as well as a breakdown of $ 3,090,026 estimated capital costs. It is assumed that 1,600 kW of electric power provided by PG&E would cost $ 0.05/kWh. *Table 2 does not include capital costs for wells, pumps, piping carbon injection or water distribution system O&M costs.*

Costs for EC™ treatment of 100,000 GPD of potable water for use in Hinkley using a one of the 600 GPM EC™ treatment trains. On of the 40' ISO containers could be augmented with skid(s) equipped with a SCADA, filter, pump and sterilization system to provide up to potable water for 200 Hinkley homes located inside the plume plus the Hinkley school. This

container would be augmented with an 8,400 gallon (12' diameter x 12' high) clarifier. The EC™ trains would operate on a 96% duty cycle (23 hours/day) to provide 821,000 GPD output at a 60 second EC™ treatment time.

EC™ treatment budgetary estimates in Table 3 are modest when compared to those of Alternative 4C-5 costing $ 271 million with a 50-year remediation time vs. a 1.8-year or a 4-year EC™ ex-situ remediation timeframe. ***EC™ costs are expected to be less than those of a chemical reduction/precipitation ex-situ system.*** Moreover the EC™ system would:

1. Reduce the physical and environmental footprint of ex-situ treatment by using four (4) 600 GPM EC™ systems in transportable 40' ISO Containers vs. a 250 GPM chemical reduction/precipitation system having only 10% of the CH(VI) removal rat as a 2400 GPM EC™ system that is expected to require 3 to 4 times the 1.324 SF required for 4 containers and a 8,400 gallon clarifier (if the 100,000 GPD EC™ potable water option is undertaken).

2. Significantly reduce plume growth and remediation expense by using a 1.8-year 2,400 GPM EC™ treatment vs. a 20-year 250 GPM chemical reduction/precipitation treatment program.

3. Despite its larger capacity pumping and water transport infrastructure, 2,400 GPM EC™ treatment would have a smaller physical and environmental impact than 250 GPM chemical reduction/precipitation treatment facilities would require shipment, handling and on-site chemical storage, settling ponds, more truck traffic and 3 to 4 times the labor force required for EC™ treatment.

4. Eliminate a chemical reduction/precipitation requirement for extensive landfill volume and cost over 20-years.

5. Provide a low cost option for 100,000 GPD of EC™ treated potable water for Hinkley residents that would produce soft water with > 98% of the hardness, silicates, CaCO3 and other groundwater constituents that foul filters and Reverse Osmosis (RO) treatment systems causing them to require extensive back-flushing and media replacement. Use of EC™ would also eliminate requirements for water softeners and would reduce fouling of desert (direct evaporative) coolers and cooling towers.

6. A 24' x 8' Powell Water Treatment (fifth wheel) trailer could be made available for 2-3 months of EC™ demonstration to support Water Board evaluation of options concerning implementation of Alternative 4C-5.

Reference:
California Regional Water Quality Control Board, Lahontan Region
Groundwater and Remediation Supporting Documentation
Comprehensive Groundwater Cleanup Strategy for Historical
Chromium Discharges from PG&E's Hinkley Compressor Station
Draft Environmental Impact Report
A-34
August 2012
ICF 00122.

Comments Concerning Draft Environmental Impact Report (EIR) of August 2012 - Remediation of chromium discharges in Hinkley, CA

Dan Hendrickson

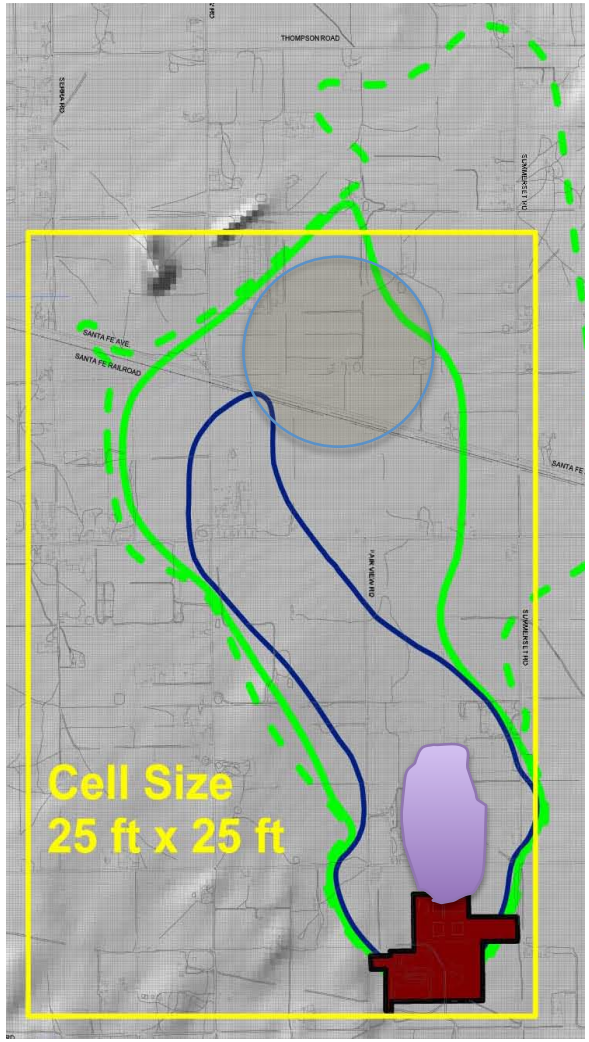
Libre Energy, Inc.

Objectives - Discuss

- Cr(VI) plume concentration and sizes
- Limitations of five EIR Alternatives
- Electrocoagulation (EC) for remediation of:
  - 7,500 acre-foot 50 - 3.500 ppm plume
  - 15,000 acre-foot 10 - 50 ppm plume
- EC pretreatment for potable water
- 10 GPM EC water treatment trailer
- 1 MW Power Package
- Conclusions

Plume Concentration and Size

- Blue > 50 ppb Cr[VI]
  - Purple Core 1,000 - 3,500 ppb
  - 7,500 acre-feet
- Green 10 - 50 ppb Cr[VI]
  - 15,000 acre-feet
- Dashed Green 3.2 - 10 ppb Cr[VI]
  - 21,500 acre-feet
  - Plume bulge moving west
- Total Size
  - 44,000 acre-feet
  - 5 miles long x 2.5 miles wide
  - 77% expansion in 1 year
- Brown TDS & nitrates: Desert View Dairy
  - Can treatment for Cr[VI] eliminate TDS?



Limitations in Draft EIR

- All Remediation alternatives require too much time

Plume Size as of	Jan-10	Jan-11	Jan-11	Jan-11	Jan-11
Alternative	4-B	4C-2	4C-3	4C-4	4C-5
Years to 50 ppb Cr(VI)	6	6	4	3	20
Years to 3.1 ppb Cr(VI)	40	39	36	29	50
Years to 1.3 ppm Cr(VI)	95	90	85	75	95
Acres	446	575	575	1,394	575
Net Present Value	$85M	$118M	$276M	$173M	$171M

- Plume Migration into Hinkley
  - *Bulge* in 3.1 ppb plume is moving west toward school/homes

- Cr(VI) contamination remaining in *dry soil* above the water table and plume core is not discussed.

Areas Investigated

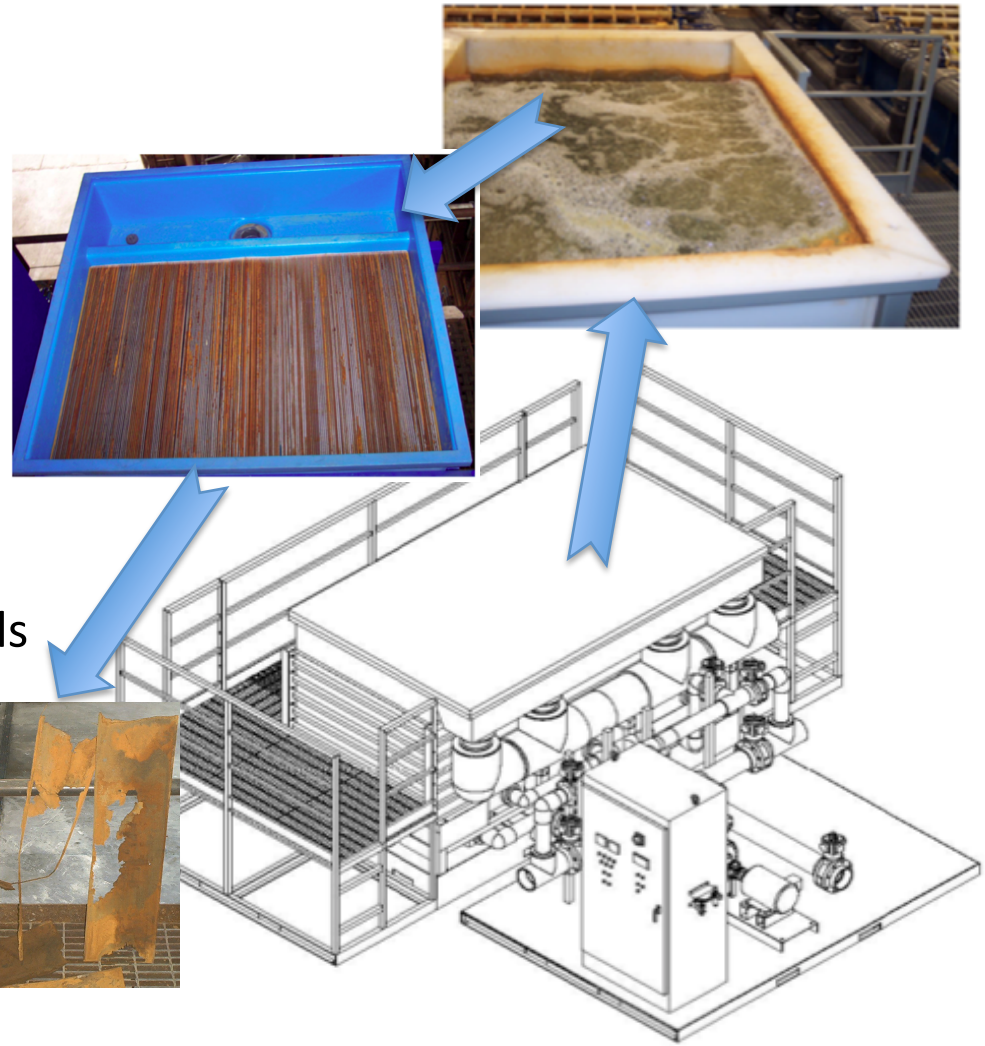
- Electrocoagulation (EC) treatment:
  - Shorter remediation 50 to 3,500 ppm plume:
    - 0.9 year to 50 ppb Cr(VI) in 50 to 3,500 ppb Cr(VI) Plume
    - 2.2 years to 3.1 ppb Cr(VI) "
    - 3.5 years to 1.3 ppb Cr(VI) "
  - Smaller Physical Footprint
  - Greater above-ground pumping capacity and distribution
  - Lower environmental impact
- Combined Heat and Power (CHP)
  - Reduced O&M cost
  - Reduced CO2 emissions

Electrocoagulation (EC) Treatment

- Treats a Range of Contaminants
  - 96% Cr[VI] removed/minute of treatment
  - 99% Cr[T] removed/minute of treatment
  - Effective against TDS (90%), nitrates (60%), arsenic (99%), magnesium and uranium
- No Process Chemicals Required
  - Reduced costs, storage and waste stream
- Minimal Waste Disposal
  - Converts Cr(T) to chromium oxide (CrO3) passes Toxic Classification Leaching Procedure
  - No clarifier r*e*quired - H2O/solids pumped into injection *w*ell after 0.5 - 2.5 minutes.
- Small Footprint - 40' ISO Container houses 600 GPM EC™ Train
- Low Environmental Impact
- Low Capital and O&M Expense
- EC™ widely used in industrial, municipal and power plant water treatment
  - Valley Detroit Diesel Allison, Bakersfield, CA: 3 GPM cleaning water from Cr plating.
  - Samsung: 360 and 600 GPM EC™ removes Nickel from LCD production line wash water.
  - Abu Dhabi and Jamaica: 135 GPM gas well production water treatment in 40' containers.
  - El Paso Electric Power: 2 x 500 GPM cooling tower and boiler feed water treatment.

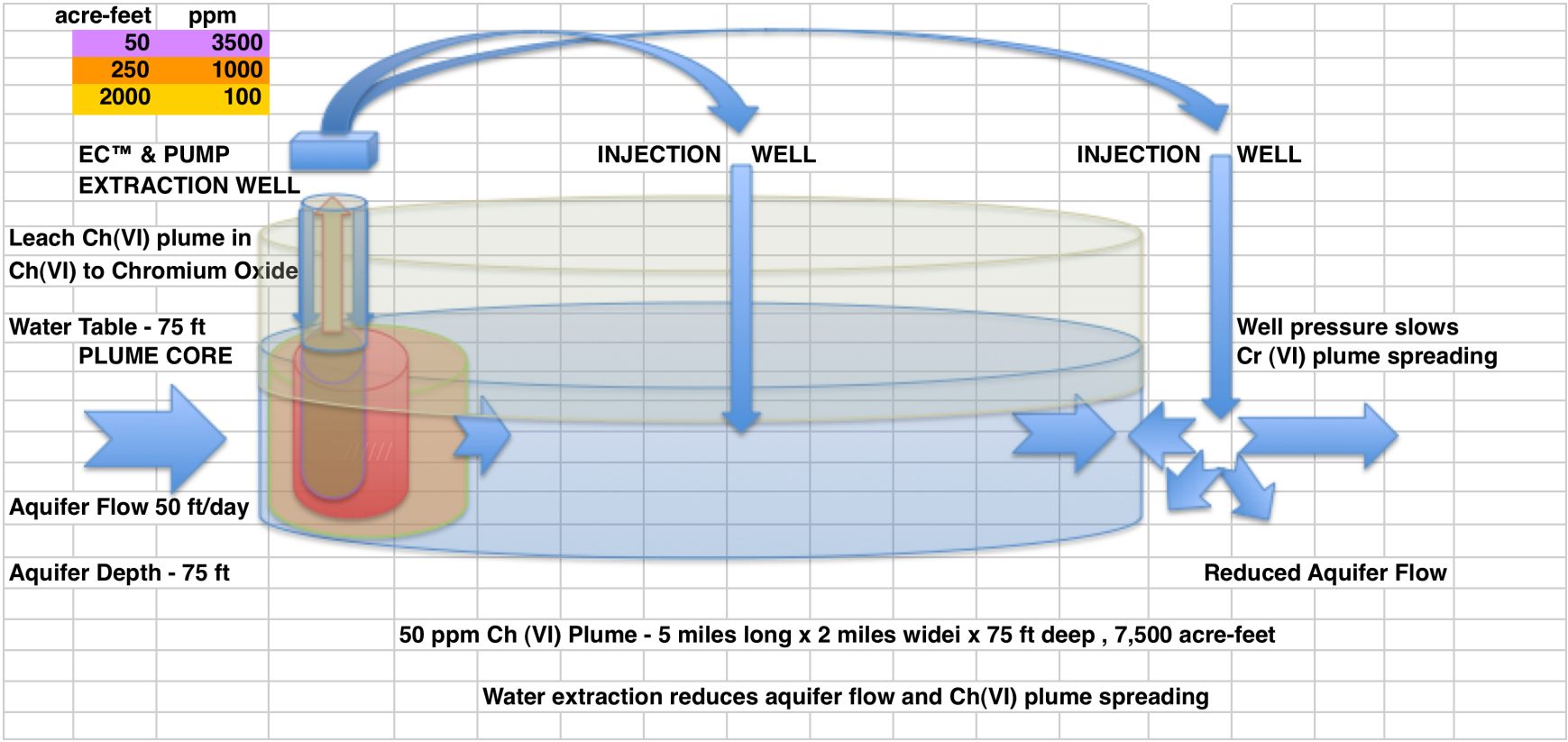
600 GPM Powell Water EC™ Train

- Housed in 40’ ISO Container
- 830,000 GPD
  - 60 second treatment
  - 480 VDC
- 17‘ L x 18’ W x 7’ H
- Gross weight:
  - 53,098 lb.
- Electrodes:
  - 30,380 lb.
  - Replace at 4 month intervals



1. 600 GPM EC™ Train
2. EC™ Chamber
3. Empty EC™ Chamber
4. New & used electrodes

50 - 3,500 ppb Plume EC™ Treatment



- Plume cross-section shows:
  - Use of residual EC™ charge to treat ***Cr[VI] contamination in dry soil above plume core***
  - Injection into wells at plume western boundary - reducing fresh water injection
  - Injection into wells in the 10 to 50 ppm Cr[VI] plume

Hybrid EC™+ Microbial In-situ Treatment

- Extract groundwater starting at the 3,500 ppb plume core,
- Treat with EC™:
  - 2.3-year remediation to 3.2 ppb, or
  - 3.5-year remediation to 1.2 ppb
- Treat EC™ effluent with carbon (ethanol) to:
  - Augment EC™ treatment with in-situ carbon/microbial remediation
- Inject in wells in a less concentrated plume area west and north of the plume core as shown in EIR Figure 3.1-18

ALSO:

- Install a 600 GPM EC™ train west of the Desert View Dairy between the 10 ppb plume and the 3.1 ppb plume boundaries
- Inject 3.1 ppb H2O at western edge of 3.1 to 10 ppm plume to control plume *bulge* toward Hinkley school.

Predicted EC™ Treatment Results

- 7,500 acre-foot 50 to 3,500 ppm Cr(VI) Plume

  Four (4) 600 GPM EC™ Trains (1,378 GPM average)

  – 0.94 year to 50 ppb vs. 3 years (Alternative 4C-4)
  – 2.2 years to 3.2 ppb vs. 29 years "
  – 3.5 years to 1.3 ppb vs. 75 years "

- 15,000 acre-foot 10 to 50 ppm Cr(VI) Plume

  Four (4) 600 GPM EC™ Trains (2,261 GPM average)

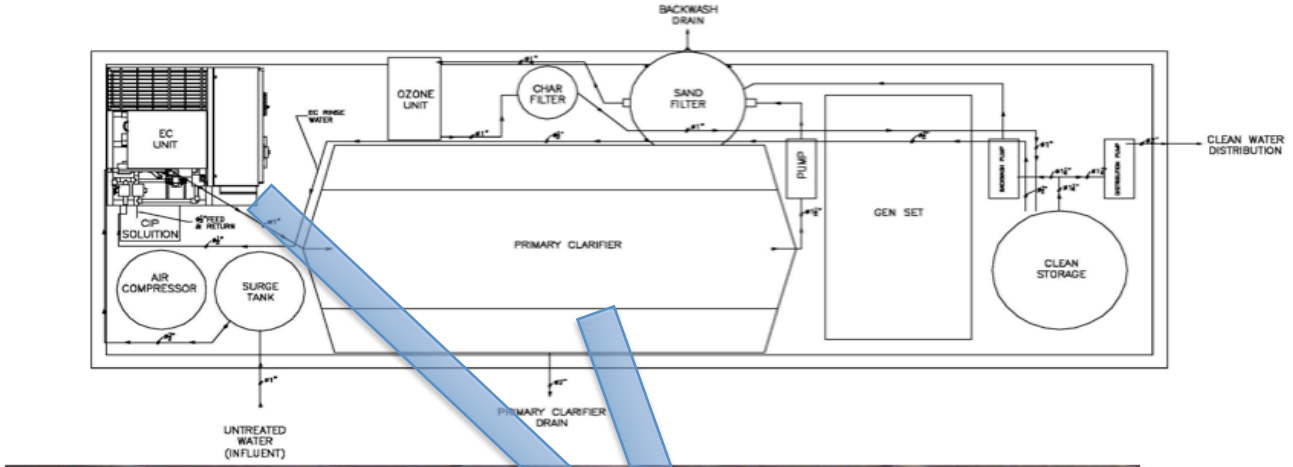
  – 1.7 years to 3.2 ppb vs. 29 years (Alternative 4C-4)
  – 4.1 years to 1.3 ppb vs. 75 years "

EC™ for Potable Water Pretreatment

- Effective on a wide range of contaminants
  - Suspended solids,
  - Colloidal solids,
  - Grease,
  - Bacteria & viruses,
  - Heavy metals (Cr(T), Iron, etc.)
  - Hardness,
  - Silica,
  - Magnesium, and
  - Organics (TDS, nitrates, phosphorus. etc.)
- Kills 99.999% of pathogens
- Reduces demands on reverse osmosis, ion exchange and sterilization
  - Extends service life
  - Reduces maintenance
- No chemicals added, waste volume is minimal (~ 0.02% by volume).
- Sludge remov**e**d with a 2-hour clarifi**e**r treatment, and
- Discharged to dumpsters for haul-off or on site landfill.

10-GPM Powell Water Trailer

- 16,000 GPD
- 24’ x 8‘
- Demonstration?



600 GPM EC™ Train Costs

600 GPM EC™ System Capital Expense				
4 x 600 GPM EC™ Train Installed Cost			$ 1,102,400	82.3%
4 x 40' ISO containers			$ 6,000	0.4%
4 x Coolerado M50 Air Conditioner			$ 7,500	0.6%
Shipping			$ 3,000	0.2%
Project Management/Engineering/Profit			$ 221,402	16.5%
600 GPM EC™ System Capital Expense			**$ 1,340,302**	**57.5%**
600 GPM EC™ O&M Expense				
Electric Power	**kWh/yr**	**Cost/kWh**	**kWh Cost/yr**	
140 kW	**1185760**	**$ 0.13**	$ 158,892	67.9%
Labor - Hours	**1095**	**$ 30.00**	$ 32,850	14.0%
EC™ Electrodes			$ 27,740	11.9%
Maintenance			$ 14,379	6.1%
600 GPM EC™ System O&M Expense			**$ 233,861**	
O&M expense: 3.5 years - 3% escalation			**$ 992,413**	**42.5%**
50 ppb Plume Total EC™ Expense to 1.2 ppb			**$ 2,332,715**	
O&M expense: 4.1 years - 3% escalation			**$ 1,018,727**	**43.2%**
10 - 50 ppb Plume Total EC™ Expense to 1.2 ppb			**$ 2,359,029**	
Total Expense Eight 600 GPM EC™ Systems to 1.2 ppb			**$ 18,766,976**	

Budgetary estimate for eight 600 GPM EC™ Trains operating simultaneously:

Total Capital Expense would be $ 10.7 million

Total O&M Expense would be $ 8.1 million

Combined Heat and Power (CHP)

- Electric power for 8 600 GPM EC™ trains
  - Would cost ~ $ 1.27 million/year
  - 68% of O&M costs
  - Can be reduced > 25% with natural gas fueled CHP package
- 40' ISO Container with 1 MW CHP package provides
  - 7,446 MWH/year electricity - enough for
    - 100% of power for ***six*** 600 GPM EC™ systems
  - $ 0.9 million savings during 3.5 years of operation
    - $ 1.75 million net capital costs (with $ 0.5 million SGIP Incentive)
    - Simple payback = 5.5 years
  - Electric power redundancy and demand management
  - 3,717 ton/year reduction in CO2 emissions

C1000 1 MW Power Package

30’ ISO Container

High Reliability

5 x 200 kW Microturbines

7,446 MWH/year

Low GHG emissions

Saves 388 tons CO2/yr

Net Capital Cost

$ 1.75 million (with $ 0.5 million SGIP incentive)

O&M Cost

$ 0.10/kWh vs. $ 0.134/kWh from Southern California Edison

Conclusions: EC™ and CHP

- EC™ is a viable ex-situ treatment for Cr[VI] at 2 sites
  - Plume Core – Increase capacity 5.5 x C4-3/C4-5 250 GPM to 1,378 GPM
  - Desert View Dairy – Increase capacity 2 x C4-3 1,100 GPM to 2,260 GPM
- Reduced remediation times:

	3.1 ppm	**1.3 ppm**
– 7,500 acre-foot 50 to 3,500 ppb Plume	2.2 years	1.4 years
– 15,000 acre-foot 10 to 50 ppb Plume	3.5 years	4.1 years

- Demonstrate 10 GPM Powell Water EC™ Trailer
  - 16,000 GPD from 50 ppb Cr[VI] groundwater source
  - EC™ pre-treatment for Hinkley water supply after demonstration?
- 1 MW natural gas fueled CHP Package provides:
  - 7,446 MWH/year electricity
  - $ 246,000/year savings in electric power costs
- Low environmental impact
  - Minimum site preparation and footprint
  - Reduced traffic, storage, facilities and cost vis-à-vis chemical coagulation
  - 388 ton/year net reduction in CO2 emissions

Draft EIR Comments (Continued)

Backup Slides

4 x 600 GPM EC™ Treatment of 7,500 acre-foot, 50 - 3,500 ppm Plume

Cum	Time	EC™	Plume	Remediation	148 sec	118 sec	72 sec	59 sec	38 sec	60 sec	Cum
Years	Years	GPM	ppb	ppb	ppb	ppb	ppb	ppb	ppb	EC™	Days
0.03	0.03	934	3500	1.3	**3.1**					**96%**	12
0.30	0.26	1172	1000	1.3		**2.9**				**96%**	101
0.94	0.65	1920	100	1.3			**3.2**			**96%**	323
2.24	1.30	2363	50	1.3				**3.2**		**96%**	782
3.50	1.26	3638	3.2	1.3					**1.3**	**96%**	1231
										Totals	
			Acre Feet Treated		50	500	2000	4950	7500	**7500**	**AF**
			Treatment Time - Days		12	97	236	474	459	**1277**	**Days**
			Plume Dilution		1.0	39	117	156	151	**463**	**AF**
		Corrected Treatment Volume - AF			49.0	461	1883	4794	7349	**7349**	**AF**
		Treatment Time Corrected for Dilution			11.9	89	222	459	449	**1231**	**Days**

- Remediation:
  - 0.94 year to 50 ppb
  - 2.2 years to 3.2 ppb
  - 3.5 years to 1.3 ppb
- Groundwater flow/mile of plume width is 120 acre-feet/year
- Groundwater plume dilution reduces volume treated by 2% in 3.5 years
- 7,963 acre-feet flows into the 10 - 50 ppb plume diluting & reducing its treatment time

4 x 600 GPM EC™ Treatment of 15,000 acre-foot 10 to 50 ppm Plume

Cum	Time	EC™	Plume	Remediation	59 sec	58 sec	56 sec	53 sec	35 sec	60 sec	Cum
Years	Years	GPM	ppb	ppb	ppb	ppb	ppb	ppb	ppb	EC™	Days
0.21	0.21	2343	50		**2.8**					**96%**	76
0.52	0.78	2383	40.0	1.3		**2.9**				**96%**	189
0.94	1.13	2469	30.0	1.3			**3.1**			**96%**	343
1.69	1.98	2608	20.0	1.3				**3.0**		**96%**	618
4.11	2.52	3950	3.0	1.3					**1.3**	**96%**	1501
										Totals	
			Acre Feet Treated		2250	3000	4500	5250	15000	**15000**	
			Treatment Time - Days		217	285	412	722	920	**2339**	**Days**
			Plume Dilution		1463	1804	2828	3250	605	9951	**AF**
		Corrected Treatment Volume - AF			787	1196	1672	2000	14395		**AF**
		Treatment Time Corrected for Dilution			75.96	113.5	153.3	274.9	883.2	1501	**Days**

- Remediation: 1.7 years to 3.2 ppb, 4.1 years to 1.3 ppb
- Groundwater flow/2 miles of plume width is 240 acre-feet/year
- Plume dilution from groundwater plus treated water cascading from the 50 - 3,500 ppb plume *reduces density of Cr(VI) in the 10 -50 ppm plume by 66% - reducing EC™ treatment time*.

Anne

Recommendations Concerning Draft Environmental Impact Report (EIR) of August 2012 - Remediation of chromium discharges in Hinkley, CA

Dan Hendrickson and Peter Lloyd

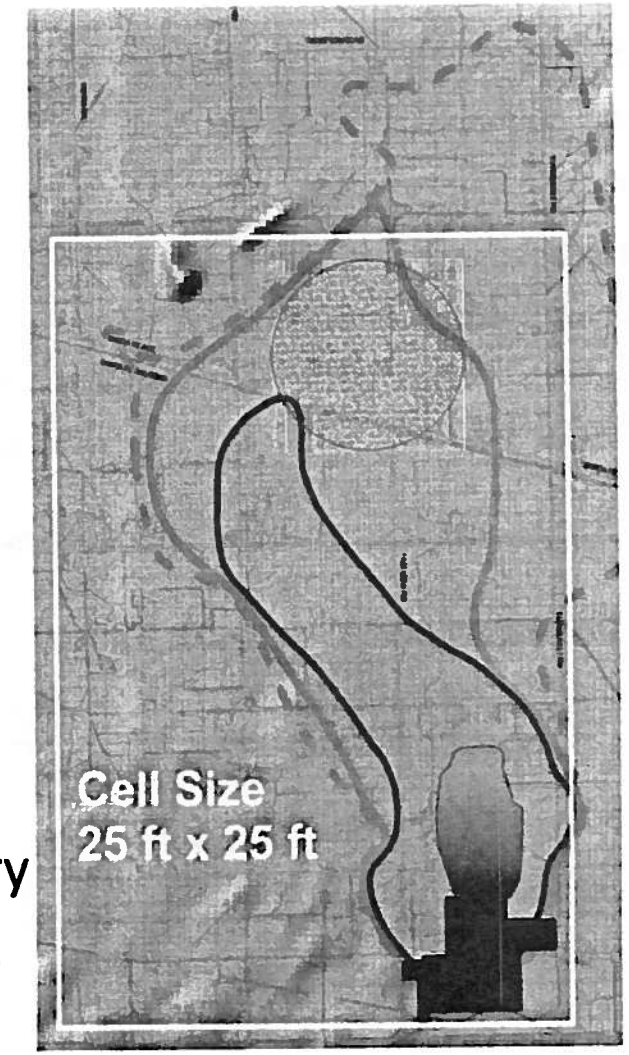
Libre Energy, Inc.

Objectives - Discuss

- Cr(VI) plume concentration and sizes
- Limitations of five EIR Alternatives
- Electrocoagulation (EC) for remediation of:
  - 7,500 acre-foot 50 - 3.500 ppm plume
  - 15,000 acre-foot 10 - 50 ppm plume
- EC pretreatment for potable water
- 10 GPM EC water treatment trailer
- Conclusions

Plume Concentration and Size

- Blue > 50 ppb Cr[VI]
  - Purple Core 1,000 - 3,500 ppb
  - 7,500 acre-feet
- Green 10 - 50 ppb Cr[VI]
  - 15,000 acre-feet
- Dashed Green 3.2 - 10 ppb Cr[VI]
  - 21,500 acre-feet
  - Plume bulge moving west
- Total Size
  - 44,000 acre-feet
  - 5 miles long x 2.5 miles wide
  - 77% expansion in 1 year
- Brown TDS & nitrates: Desert View Dairy
  - Can treatment for Cr[VI] eliminate TDS?



Limitations in Draft EIR Alternatives

Plume Size as of	Jan-10	Jan-11	Jan-11	Jan-11	Jan-11
Alternative	4-B	4C-2	4C-3	4C-4	4C-5
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Years to 3.1 ppb Cr(VI)	40	39	36	29	50
Years to 1.3 ppm Cr(VI)	95	90	85	75	95
Acres	446	575	575	1,394	575
Net Present Value	$85M	$118M	$276M	$173M	$171M

- **All Remediation alternatives require too much time**
- Plume Migration into Hinkley?
  - *Is the Bulge* in the 3.1 – 10 ppb plume moving west toward school/homes?
  - Extract water from center of plume near dairy and inject at the western edge of the bulge
- Cr(VI) contamination in *dry soil* above the water table at plume core is not discussed.

Electrocoagulation (EC)

- Electrochemical conversion of Cr(T)/Cr(VI) to CrO_3:
  - CrO_3 passes Toxic Classification Leaching Procedure (TCLP) and
  - Can be returned to the soil/aquifer
- Shorter remediation of 50 to 3,500 ppm plume:
  - 0.9 year to 50 ppb Cr(VI) in 50 to 3,500 ppb Cr(VI) Plume
  - 2.2 years to 3.1 ppb Cr(VI)
  - 3.5 years to 1.3 ppb Cr(VI)
- Smaller Physical Footprint
- Greater well pumping and above-ground distribution
- Lower environmental impact
  - Reduce Cr(VI) to 3.1 ppb to augment AU treatment AND
  - Reduce Cr(VI) to 1.3 ppb and inject into aquifer at plume boundaries

Electrocoagulation (EC) Treatment

- Treats a Wide Range of Contaminants
  - 96% Cr[VI] removed/minute of treatment
  - 99% Cr[T] removed/minute of treatment
  - Effective for TDS (90%), Nitrates (60%), Arsenic (99%), Manganese (98%) & Uranium (99%)
- No Process Chemicals Required
  - Reduced costs, storage and waste stream
- Minimal Waste Disposal
  - Converts Cr(T) to chromium oxide (CrO_3) passes Toxic Classification Leaching Procedure
  - No clarifier required - H2O/solids pumped into injection well after 0.5 - 2.5 minutes.
- Small Footprint - 40' ISO Container with:
  - 600 GPM (830,000 GPD) EC™ Train
  - Distribution Pump Station
- Low Capital and O&M Expense
- EC™ widely used in industrial, municipal and power plant water treatment
  - Valley Detroit Diesel Allison, Bakersfield, CA: 3 GPM cleaning water from Cr plating.
  - Samsung: 360 and 600 GPM EC™ removes Nickel from LCD production line wash water.
  - Abu Dhabi and Jamaica: 135 GPM gas well production water treatment in 40' containers.
  - El Paso Electric Power: 2 x 500 GPM cooling tower and boiler feed water treatment.

Predicted EC™ Treatment Results

- 7,500 acre-foot 50 to 3,500 ppm Cr(VI) Plume

  Four (4) 600 GPM EC™ Trains (1,378 GPM average)

  – 0.94 year to 50 ppb vs. 3 years (Alternative 4C-4)
  – 2.2 years to 3.2 ppb vs. 29 years "
  – 3.5 years to 1.3 ppb vs. 75 years "

- 15,000 acre-foot 10 to 50 ppm Cr(VI) Plume

  Four (4) 600 GPM EC™ Trains (2,261 GPM average)

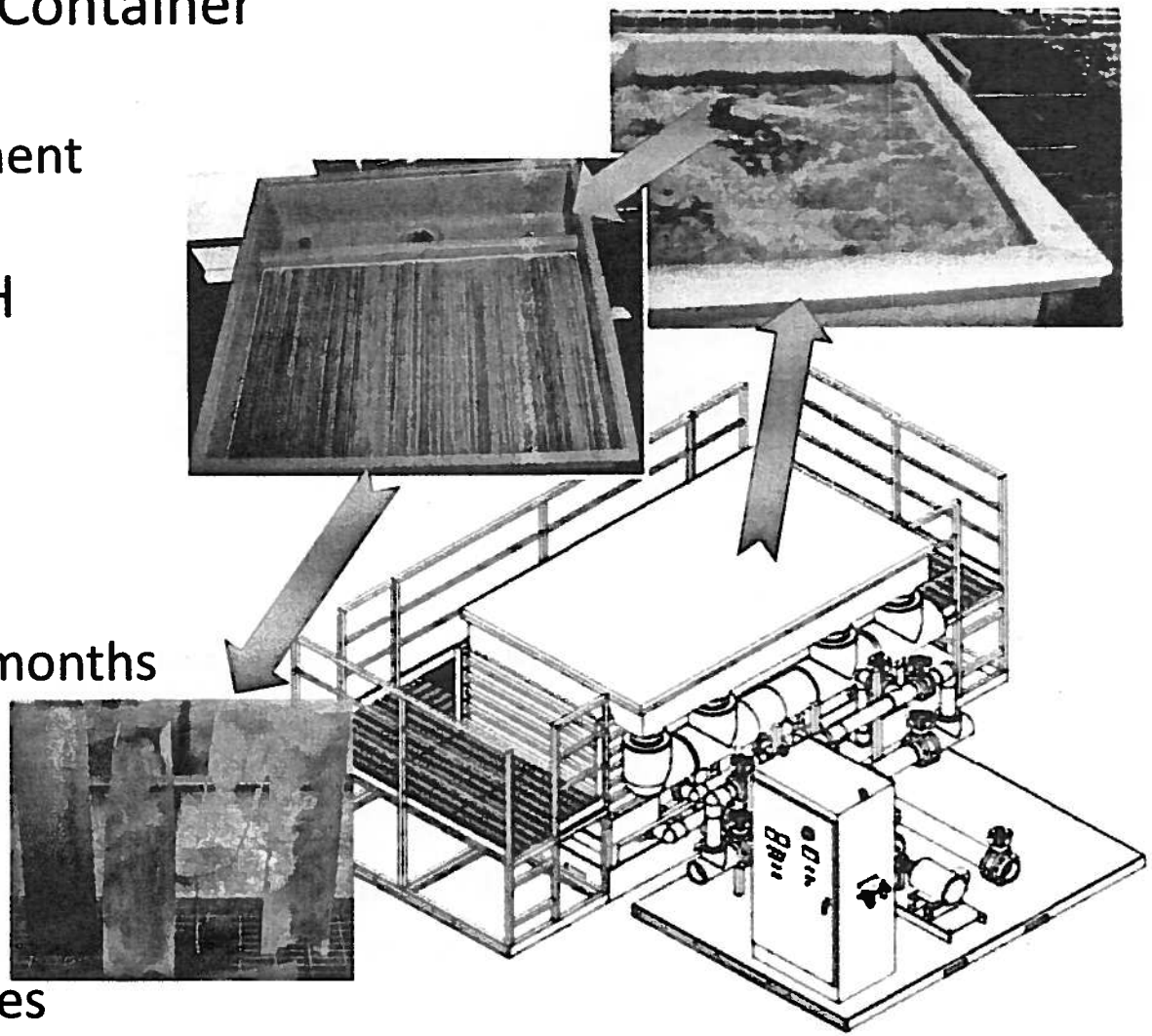
  – 1.7 years to 3.2 ppb vs. 29 years (Alternative 4C-4)
  – 4.1 years to 1.3 ppb vs. 75 years "

EC™ for Potable Water Pretreatment

- Effective for treating a wide range of contaminants
  - Suspended solids,
  - Colloidal solids,
  - Grease,
  - Bacteria & viruses,
  - Heavy metals (Arsenic, Cr(T), Iron, Manganese, Uranium, etc.)
  - Hardness,
  - Silica, and
  - Organics (TDS, nitrates, phosphorus. etc.)
- Kills 99.999% of pathogens
- Reduces demands on reverse osmosis, ion-exchange and sterilization
  - Extends service life
  - Reduces maintenance
- No chemicals added, waste volume is minimal (~ 0.02% by volume).
- Sludge removed with a 2-hour clarifier treatment, and
- Discharged to dumpsters for haul-off to landfill.

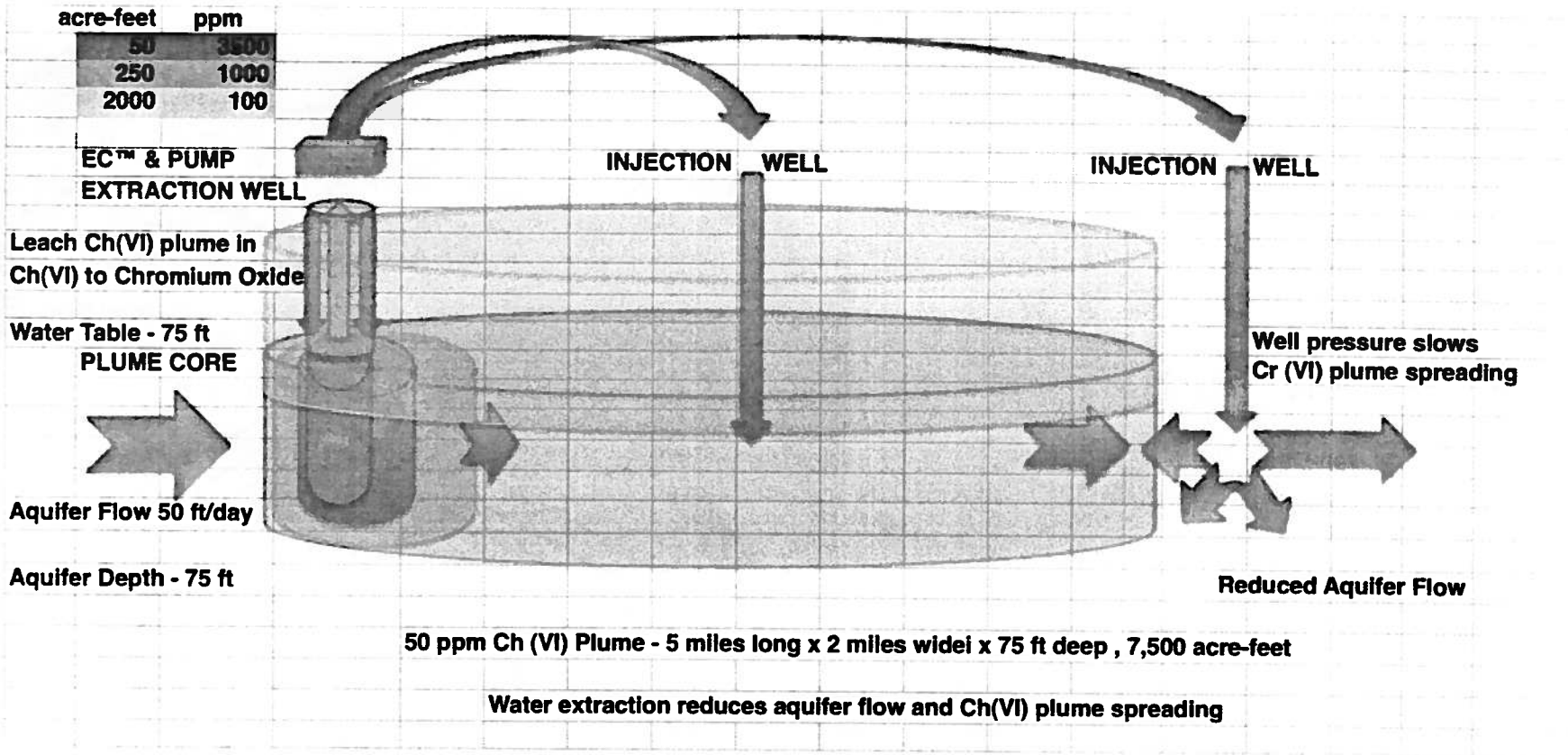
600 GPM Powell Water EC™ Train

- Housed in 40' ISO Container
- 830,000 GPD
  - 60 second treatment
  - 480 VDC
- 17' L x 18' W x 7' H
- Gross weight:
  - 53,098 lb.
- Electrodes:
  - 30,380 lb.
  - Replace every 4 months



1. 600 GPM EC™ Train
2. EC™ Chamber
3. Empty EC™ Chamber
4. New & used electrodes

50 - 3,500 ppb Plume EC™ Treatment



- Plume cross-section shows:
  - ***Use of residual EC™ charge to treat Cr[VI] contamination in dry soil above plume core***
  - Injection into wells at plume western boundary - reducing fresh water injection
  - Injection into wells at the edges the 10 to 50 ppm Cr[VI] plume

Recommend

- Modify Alternative 4C-5 to Include:
  - Use electrocoagulation vs. chemical treatment
  - Reduce remediation time and cost
  - Reduce AU treatment and land/water rights costs
- Lower environmental impact
  - Reduced footprint - 40' ISO Containers
  - Transportable - nominal site preparation
  - Higher capacity - 800,000 GPD/Container - low cost/Acre-Foot
  - Possible use of 1 MW CHP Module - Reduced CO_2 emissions
  - ***Reduce Cr(VI) plume to 3.1 ppb in 2.2 years***

Conclusions: EC™ and CHP

- EC™ is a viable ex-situ treatment for Cr[VI] at 2 sites
  - Plume Core – Increase capacity 5.5 x C4-3/C4-5 250 GPM to 1,378 GPM
  - Desert View Dairy – Increase capacity 2 x C4-3 1,100 GPM to 2,260 GPM
- Reduced remediation times:

	3.1 ppm	**1.3 ppm**
– 7,500 acre-foot 50 to 3,500 ppb Plume	2.2 years	1.4 years
– 15,000 acre-foot 10 to 50 ppb Plume	3.5 years	4.1 years

- Demonstrate 10 GPM Powell Water EC™ Trailer
  - 16,000 GPD from 50 ppb Cr[VI] groundwater source
  - EC™ pre-treatment for Hinkley water supply after demonstration?
- 1 MW natural gas fueled CHP Package provides:
  - 7,446 MWH/year electricity
  - $ 246,000/year savings in electric power costs
- Low environmental impact
  - Minimum site preparation and footprint
  - Reduced traffic, storage, facilities and cost vis-à-vis chemical coagulation
  - 388 ton/year net reduction in CO2 emissions

C1000 1 MW Power Package

30’ ISO Container

High Reliability

5 x 200 kW Microturbines

7,446 MWH/year

Low GHG emissions

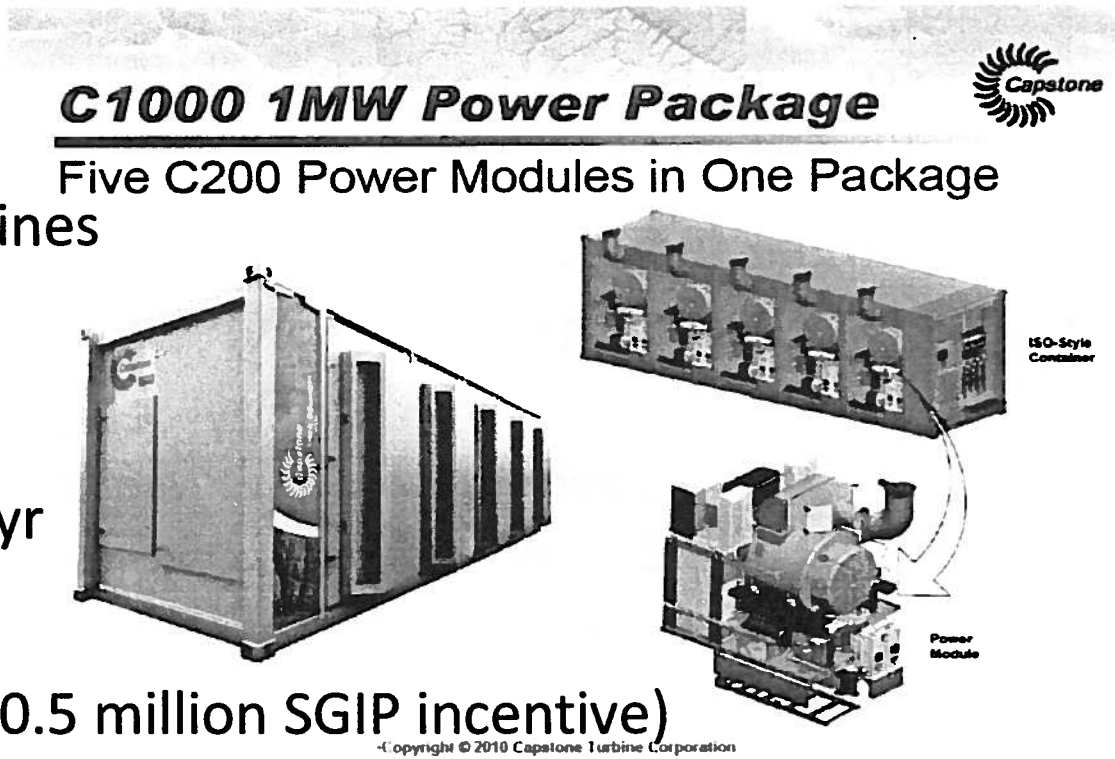
Saves 388 tons CO2/yr

Net Capital Cost

$ 1.75 million (with $ 0.5 million SGIP incentive)

O&M Cost

$ 0.10/kWh vs. $ 0.134/kWh from Southern California Edison



Combined Heat and Power (CHP)

- Electric power for 8 600 GPM EC™ trains
  - Would cost ~ $ 1.27 million/year
  - 68% of O&M costs
  - Can be reduced > 25% with natural gas fueled CHP package
- 40' ISO Container with 1 MW CHP package provides
  - 7,446 MWH/year electricity - enough for
    - 100% of power for ***six*** 600 GPM EC™ systems
  - $ 0.9 million savings during 3.5 years of operation
    - $ 1.75 million net capital costs (with $ 0.5 million SGIP Incentive)
    - Simple payback = 5.5 years
  - Electric power redundancy
  - Demand management
  - 3,717 ton/year reduction in CO2 emissions

4 x 600 GPM EC™ Treatment of 7,500 acre-foot, 50 - 3,500 ppm Plume

Cum Years	Time Years	EC™ GPM	Plume ppb	Remediation ppb	148 sec ppb	118 sec ppb	72 sec ppb	59 sec ppb	38 sec ppb	60 sec EC™	Cum Days
0.03	0.03	934	3500	1.3	3.1					96%	12
0.30	0.26	1172	1000	1.3		2.9				96%	101
0.94	0.65	1920	100	1.3			3.2			96%	323
2.24	1.30	2363	50	1.3				3.2		96%	782
3.50	1.26	3638	3.2	1.3					1.3	96%	1231
										Totals	
				Acre Feet Treated	50	500	2000	4950	7500	7500	AF
				Treatment Time - Days	12	97	236	474	459	1277	Days
				Plume Dilution	1.0	39	117	156	151	463	AF
				Corrected Treatment Volume - AF	49.0	461	1883	4794	7349	7349	AF
				Treatment Time Corrected for Dilution	11.9	89	222	459	449	1231	Days

- Remediation:
  - 0.94 year to 50 ppb
  - 2.2 years to 3.2 ppb
  - 3.5 years to 1.3 ppb
- Groundwater flow/mile of plume width is 120 acre-feet/year
- Groundwater plume dilution reduces volume treated by 2% in 3.5 years
- 7,963 acre-feet flows into the 10 - 50 ppb plume diluting & reducing its treatment time

Draft EIR Comments (Continued)

Backup Slides

4 x 600 GPM EC™ Treatment of 15,000 acre-foot 10 to 50 ppm Plume

Cum	Time	EC™	Plume	Remediation	59 sec	58 sec	56 sec	53 sec	35 sec	60 sec	Cum
Years	Years	GPM	ppb	ppb	ppb	ppb	ppb	ppb	ppb	EC™	Days
0.21	0.21	2343	50		2.8					96%	76
0.52	0.78	2383	40.0	1.3		2.9				96%	189
0.94	1.13	2469	30.0	1.3			3.1			96%	343
1.69	1.98	2608	20.0	1.3				3.0		96%	618
4.11	2.52	3950	3.0	1.3					1.3	96%	1501
										Totals	
			Acre Feet Treated		2250	3000	4500	5250	15000	15000	
			Treatment Time - Days		217	285	412	722	920	2339	Days
			Plume Dilution		1463	1804	2828	3250	605	9951	AF
			Corrected Treatment Volume - AF		787	1196	1672	2000	14395		AF
			Treatment Time Corrected for Dilution		75.96	113.5	153.3	274.9	883.2	1501	Days

- Remediation: 1.7 years to 3.2 ppb, 4.1 years to 1.3 ppb
- Groundwater flow/2 miles of plume width is 240 acre-feet/year
- Plume dilution from groundwater plus treated water cascading from the 50 - 3,500 ppb plume *reduces density of Cr(VI) in the 10 -50 ppm plume by 66% - reducing EC™ treatment time.*

600 GPM EC™ Train Costs

600 GPM EC™ System Capital Expense					
[redacted] 600 GPM EC™ Train Installed Cost			$	1,102,400	82.3%
[redacted] 40' ISO containers			$	6,000	0.4%
[redacted] Coolerado M50 Air Conditioner			$	7,500	0.6%
Shipping			$	3,000	0.2%
Project Management/Engineering/Profit			$	221,402	16.5%
600 GPM EC™ System Capital Expense			**$**	**1,340,302**	**57.5%**
600 GPM EC™ O&M Expense					
Electric Power	**kWh/yr**	**Cost/kWh**		**kWh Cost/yr**	
140 kW	**1185760**	**$ 0.13**	$	158,892	67.9%
Labor - Hours	**1095**	**$ 30.00**	$	32,850	14.0%
EC™ Electrodes			$	27,740	11.9%
Maintenance			$	14,379	6.1%
600 GPM EC™ System O&M Expense			**$**	**233,861**	
O&M expense: 3.5 years - 3% escalation			**$**	**992,413**	**42.5%**
50 ppb Plume Total EC™ Expense to 1.2 ppb			**$**	**2,332,715**	
O&M expense: 4.1 years - 3% escalation			**$**	**1,018,727**	**43.2%**
10 - 50 ppb Plume Total EC™ Expense to 1.2 ppb			**$**	**2,359,029**	
Total Expense Eight 600 GPM EC™ Systems to 1.2 ppb			**$**	**18,766,976**	

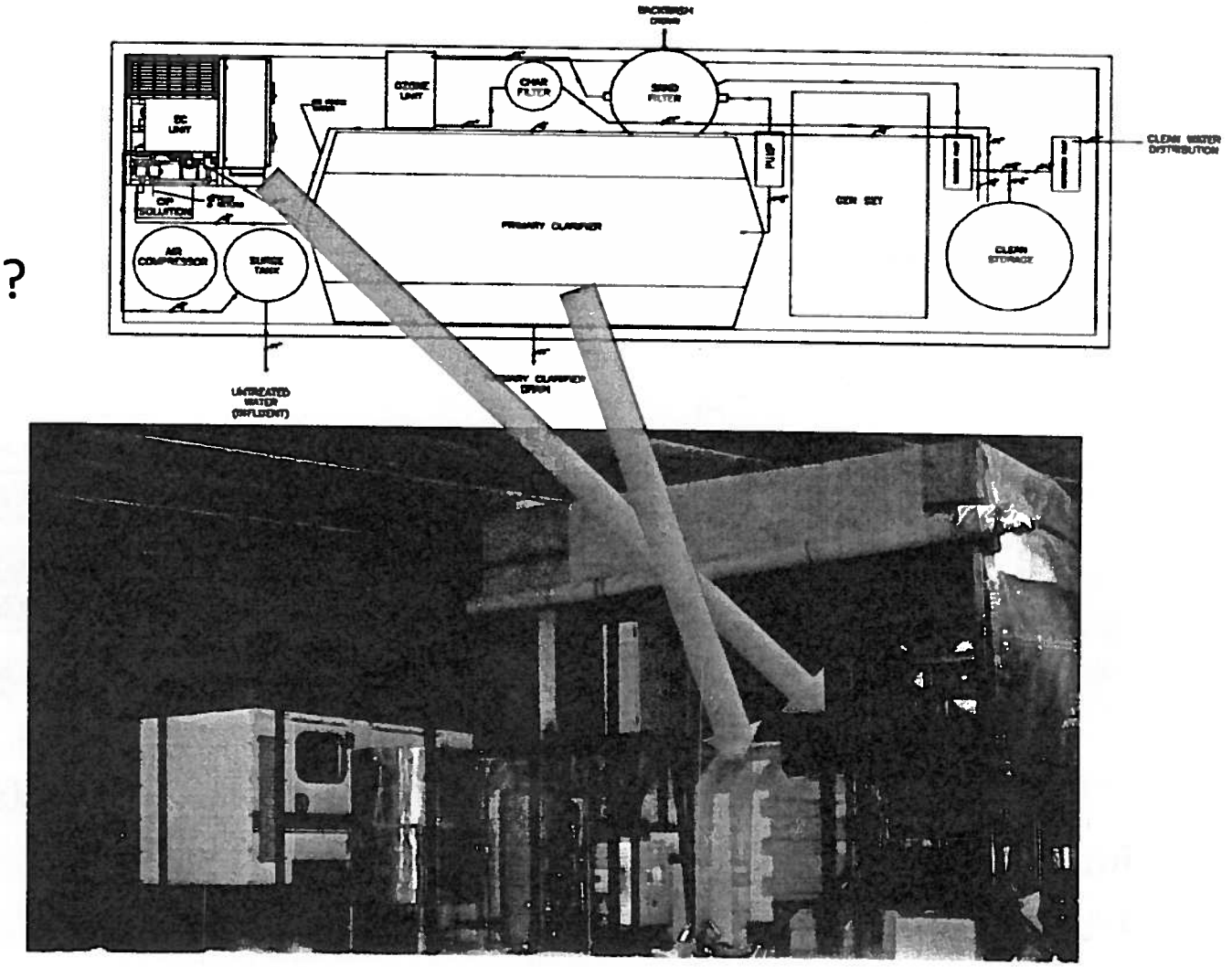
Budgetary estimate: eight 600 GPM EC™ Trains operating simultaneously

Total Capital Expense - $ 10.7 million

4.1 year O&M Expense - $ 8.1 million

10-GPM Powell Water Trailer

- 16,000 GPD
- 24' x 8'
- Demonstration?



POWELL WATER SYSTEMS, INC.

The following drinking water tests were performed on natural well water in California to determine the effectiveness of electrocoagulation at low contamination levels.

Item	MCL	Before EC	After EC	% removal
Chromium 6		32 ppb	less than 1 ppb	96%
Arsenic	10 ppb	76 ppb	2.2 ppb	97%
Total Alpha	15 pCi/l	24 pCi/l	Less than 1 pCi/l	95%

The metals made separable from water using electrocoagulation are in the oxide form or non hazardous which saves significant disposal costs.

POWELL WATER SYSTEMS, INC

This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory by Bill Daily Jr.

Sample Description	Uranium (µg/L)	% Removal
Influent	130	
Influent Duplicate	130	
2 electrodes @ 1 gpm	1.9	98%
2 electrodes @ 1 gpm dup	1.8	98%
2 electrodes @ 2 gpm	5.2	96%
3 electrodes @ 2 gpm	0.64	99%
3 electrodes @ 1 gpm	0.24	99%
5 electrodes @ 1 gpm	0.36	99%
5 electrodes @ 2 gpm	0.22	99%

Uranium Lawrence Livermore National Laboratory

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD

To whom it may concern,

My name is Evelio Hernandez. First, I would like to thank you for the opportunity for taking the time to read this letter. At the Lahontan Regional Water Quality Control Board meeting on September 13, 2012 in Barstow, I was very impressed with the board's performance. The water board conducted themselves in a very informative and respectable manner. Despite the negative remarks that are commonly stated in these meetings, the water board always responds in the most professional manner, not only to the Community Advisory Committee (CAC), but also to the community members who attend these meetings. With that said, I do believe that these meetings should be run by an independent, neutral third party in order to ensure that the water board and the community members of Hinkley get an equal chance to participate.

Throughout this letter, I would like to address some serious concerns that I have as a current home-owner in the Hinkley community, and as a member of the Community Advisory Committee (CAC). I have seen how the hexavalent chromium contamination caused by Pacific Gas and Electric Company (PG&E) has affected the community of Hinkley over the last 50 years. My concerns are about PG&E not taking into consideration the suggestions that the community has asked for in regards to solutions to clean-up the chromium plume. PG&E has their agenda already in place, including how their solution to the contaminated water problem is to either install a whole-house water treatment system, a deeper-well, or (if qualified) for Hinkley residents to participate in the buy-out program. The water board, in conjunction with PG&E, continues to neglect the voice of the community members whose lives are truly affected by this ordeal. It is time for the suggestions given by the Hinkley community members of how to

solve this problem be put into effect. Otherwise, if left in the hands of PG&E, resident's lives will continue to be ruined by these problems, as they have now for so many years. We need the Lahonton Water Board to hear our voice and advocate on our behalf to PG&E to solve the problem of providing safe drinking water to all the residents of Hinkley.

The community of Hinkley has suffered over the last 50 years from the loss of some three-thousand people who have either moved willingly or have had no other choice to move given that to stay, would be sacrificing their health. In addition, the property value has decreased dramatically for the Hinkley home-owners over the last several years due to the contamination problem.

When PG&E conducts studies and makes decisions on behalf of the Hinkley community, they base their decision solely off of those individuals who they feel are affected by the chromium contamination and they do not consider the community as a whole. PG&E determines who is included within the plume and who is not. Below in Appendix I, I have suggestions as to how I believe the plume should be defined. The reality is, everyone in Hinkley is affected by the hexavalent chromium contamination directly or indirectly. PG&E must address the concerns of those individuals who live just outside the predetermined plume affected areas as well as those who live within the plume area whose water seems to test clean, for now anyways. Take for example my home, which is located at 36236 Serra Rd, Hinkley, CA, 92347. The adjacent neighbor to my right has been bought-out as well my neighbor to the left. Every other house around me has also been tested and found contaminated due to their water testing positive for levels of chromium six. Ironically, despite the fact that there is contaminated water surrounding my entire property, the test results of CH2MHill (a global project delivery company contracted by PG&E) deemed my water safe from harmful levels of chromium.

Thus, I am faced with several problems in regards to my water, my health, the future of my community and the never-ending contamination in my neighborhood. According to PG&E, I do not meet the criteria to be eligible to participate in the buy-out program. My concern for my health and the health of my family increases each day due to the contamination in all the areas surrounding my home. Today my water may test clean, but who knows what tomorrow will bring. Not to mention my dreams of retiring in a neighborhood with close friends next door have diminished as the water contamination forced them to move away. In addition, with the value of my property dramatically decreased due to the dwindling of my neighborhood and the contamination of the water surrounding me, it is nearly impossible to get what I put into the house and to be able to rebuild the home I have worked so hard for anywhere else.

Furthermore, it is equally disconcerting that no one appears to take into consideration the fact that extremely high levels (6.9, 5.2, 4.8 etc.,) of CH6 are appearing on Hinkley Road. I believe PG&E has a fiduciary responsibility to accept and correct any and all hexavalent chromium within the entire zip code of Hinkley. It is possible that PG&E has missed a stream or vein of water that is contaminating the area west of their compressor station. Either recent floods (2011) have carried the CH6 to the west of the compressor station or the in situ treatment has caused the redirection of a water vein to the west when PG&E stopped it from traveling towards the school.

I am suggesting that PG&E pipe in water lines from the Mojave Water Agency main water line to everybody's house in Hinkley in order to save what is left of the Hinkley community and to solve this problem once and for all. This would include installing pipes to landowners as well so they would have the opportunity to build on their property in the future. The past is the past and the damage has already been done. The focus must be on moving forward and ensuring environmental justice for the residents of Hinkley.

I agree and am in favor of the idea proposed of the whole-house water treatment as a temporary solution. However, in order to solve the contamination problem completely, Hinkley residents need a long-term solution. The idea I suggested of installing water lines would decouple all families affected by the plume from chromium six and other contaminants. This would allow potential for the Hinkley community to be restored and even for lots that are currently vacant to have the opportunity to turn into a place of residence again. This would save the community of Hinkley from being completely diminished and would allow the possibility for the community to begin to rebuild and start to grow again, which in turn would increase property value.

In addition, I am strongly suggesting that the water board and PG&E further investigate the concern recently brought to my attention regarding the unsafe levels of arsenic and manganese in the water. As you can see from the example in Appendix II listed below, dangerous levels of arsenic and manganese were shown in wells that were tested back on 10/11/12 by E.S.Babcock & Sons, Inc. (an Environmental Laboratory). This concern needs to be addressed immediately because the levels of manganese and arsenic are more dangerous than the chromium six levels we were facing to begin with. The Community Advisory Committee (CAC) is in majority agreement that the "in situ treatment program" should be shut-down until we can figure out why these other containments are coming up so high. It is ludicrous for the residents of Hinkley to be subjected to increasingly more dangerous contaminants (arsenic and manganese) which appear to be the direct by-products of ethanol injections, while PG&E is given credit for the chromium six cleanup.

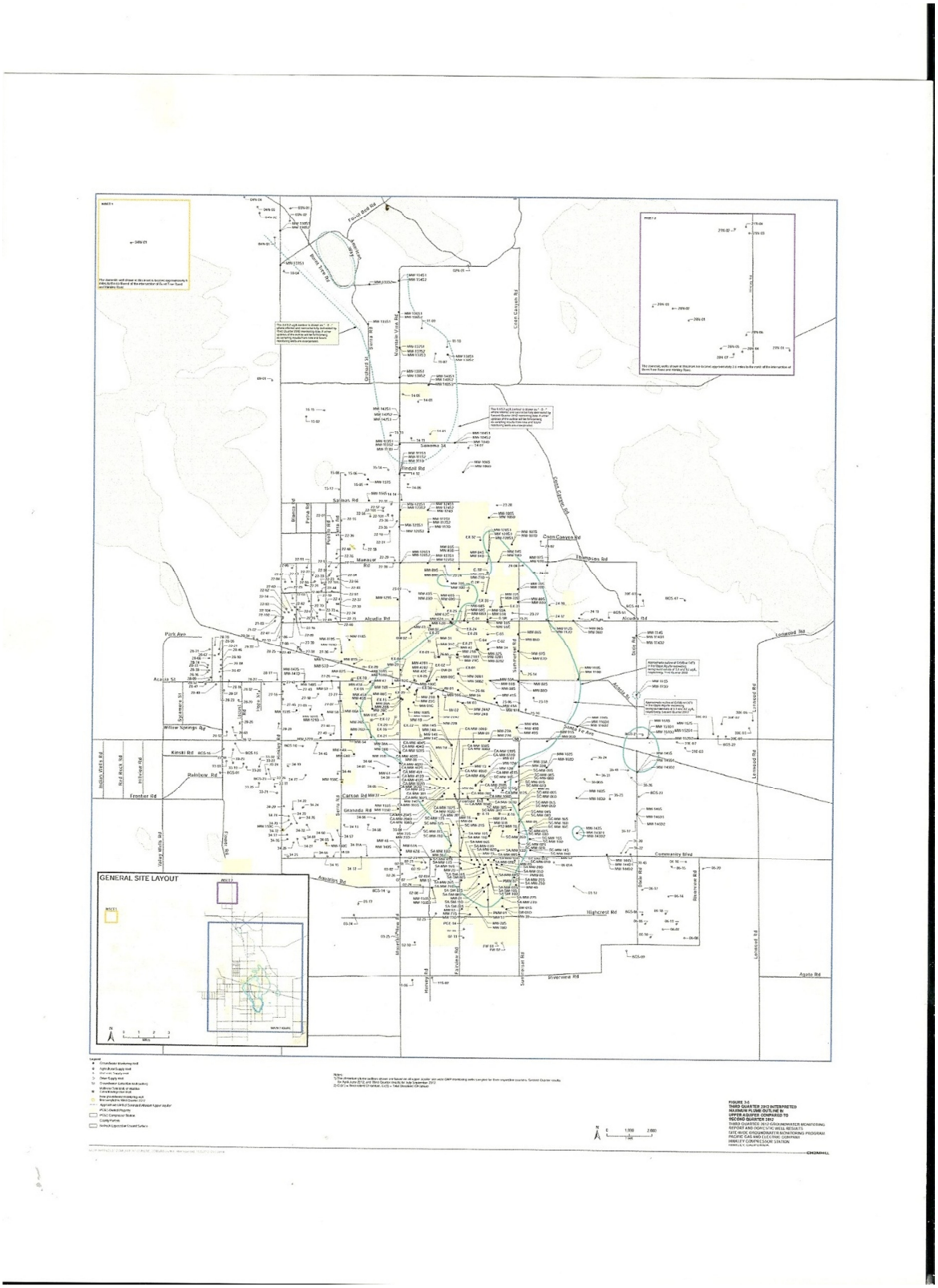
For any further questions or concerns please feel free to contact me. I look forward to your response. The water board's willingness to accept public comments on important issues, such as the cleanup project and unsafe containments in the water is very much appreciated.

Sincerely,

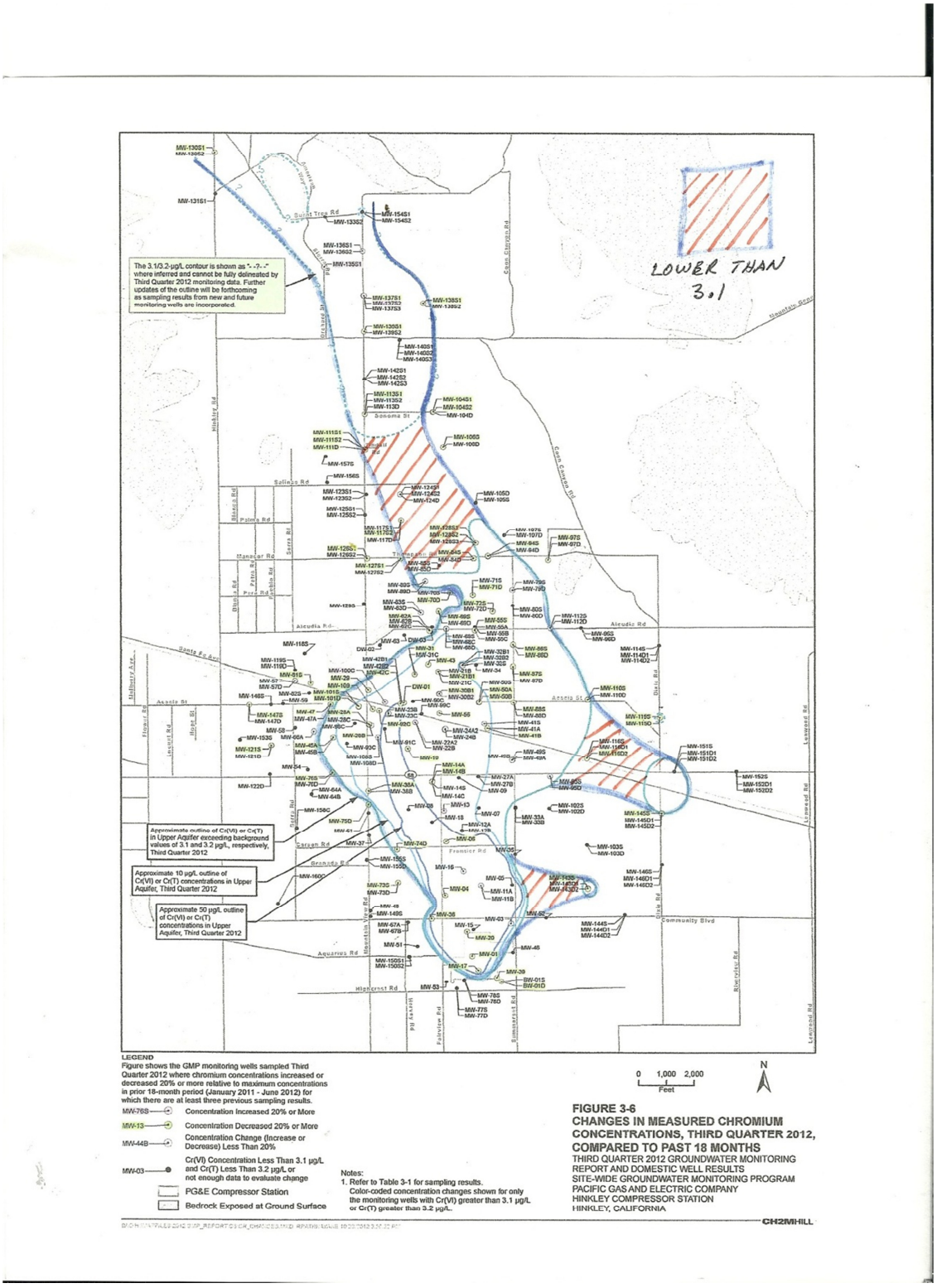
Evelio Hernandez

Appendix I

This is an example of the most current 2012 plume map which I believe is misleading:



This is the same map however it includes the suggestions I believe should be taken into consideration when drawing the plume map. Instead of showing individual plume areas, we should show the public the affected areas and the path that it took to get there and if the path is lower than 3.1, it can be highlighted in a different color.



Appendix II

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name:Morris, Bobby
Contact:Bobby Morris

Analytical Report: Page 2 of 4
Project Name: No Project
Project Number: --PAID--Cr

Work Order Number: B2J1452

Report Date:23-Oct-2012

Received on Ice (Y/N): No Temp: 20°C

	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
B2J1452-01 *Sampled: 10/11/12 10:30*							
#1 049428202							
Arsenic	170	40	ug/L	EPA 200.8	10/19/12 17:01	AAV	N_noH, Nconf
Manganese	140000	5000	ug/L	EPA 200.8	10/19/12 15:15	AAV	
B2J1452-02 *Sampled: 10/11/12 10:30*							
#2 049428202							
Arsenic	71	2.0	ug/L	EPA 200.8	10/19/12 15:37	AAV	Nconf
Manganese	320	20	ug/L	EPA 200.8	10/17/12 15:17	AAV	
B2J1452-03 *Sampled: 10/11/12 10:30*							
#3 049428202							
Arsenic	5.6	2.0	ug/L	EPA 200.8	10/17/12 15:20	AAV	
Manganese	66	20	ug/L	EPA 200.8	10/17/12 15:20	AAV	
B2J1452-04 *Sampled: 10/11/12 08:00*							
C.C. Matthiesen 36771 Hidden River Rd., Hinkley CA 92347							
Arsenic	22	2.0	ug/L	EPA 200.8	10/19/12 15:39	AAV	Nconf
Manganese	320	20	ug/L	EPA 200.8	10/17/12 15:22	AAV	
B2J1452-05 *Sampled: 10/11/12 11:00*							
Roberts 22275 Granada, Hinkley Ca 92347							
Arsenic	11	2.0	ug/L	EPA 200.8	10/16/12 16:54	AAV	Nconf
Manganese	87	20	ug/L	EPA 200.8	10/16/12 12:48	AAV	

Holden, Anne@Waterboards

From: Aniko Kegyulics
Sent: Monday, September 17, 2012 10:26 AM
To: Holden, Anne@Waterboards
Subject: PGE Hinkley Clean up Comments

Here is my comment about the PG&E and Hinkley Clean Up issue:

I believe that public water to the city of Hinkley would be the only solution during the time they need to clean it up naturally. The chemically induced clean up is making it worse.

I know this comment doesn't make a difference, but I just wanted to make my opinion noted.

Thanks,
Aniko

10/16/2012 EIR mtg
40 people in attendance

Wanda S. Monk

1. How do we get the historical records of well test results for our property? (PG&E test results)

2. How much exposure to Chromium 6 did we get from the pool that PG+E allowed people to swim in in the 1960's + 1970's?

3. We live in the old riverbed and PG+E said we do not qualify for a deeper well because there is no clay (blue) Why is this?

OCTOBER 18, 2012

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

ATTENTION: LISA DERNBACH & ANNE HOLDEN

AS PER OUR CONVERSATION AT HINKLEY MIDDLE SCHOOL ON OCT. 16, 2012 COULD YOU PLEASE SEND US SOMETHING IN WRITING PERTAINING TO THE FOLLOWING QUESTIONS –

1. TEST RESULTS FOR TESTS THAT PG&E HAVE DONE ON OUR WELLS LOCATED AT 34655 MTN. VIEW RD.
2. PG&E STATED THAT THE DEEPER WELL OPTION WAS NOT FEASIBLE FOR US BECAUSE WE DON'T HAVE ANY CLAY WHERE WE LIVE.
3. PG&E POOL TEST RESULTS – HOW MUCH CHROMIUM WERE WE EXPOSED TO BY PG&E ALLOWING PEOPLE AND ORGANIZATIONS TO SWIM IN THEIR POOL AT THE HINKLEY COMPRESSOR STATION?
4. DOCUMENTION THAT PG&E ACKNOWLEDGES THEIR POOL AT THE HINKLEY COMPRESSOR STATION EXISTED.

WE KNOW THAT CHROMIUM 6 IS IN THE AREA THAT WE LIVE IN (SOUTH OF THE COMPRESSOR STATION) BECAUSE WE HAVE BEEN TOLD BY THREE OF OUR NEIGHBORS THAT THEY HAVE CHROMIUM 6 IN THEIR WELLS. ONE NEIGHBOR HAS OVER 4.0 PPB OF CHROMIUM 6. ANOTHER NEIGHBOR HAS OVER 3.0 PPB OF CHROMIUM 6. AND STILL ANOTHER NEIGHBOR HAS OVER 2.0 PPB OF CHROMIUM 6. ALL OF THESE NEIGHBORS ARE OVER ½ MILE SOUTH OF RIVERVIEW ROAD. SO THE CHROMIUM 6 IS FLOWING UP-STREAM AND IN INCREASING AMOUNTS. PG&E IS SUPPLYING THEM ALL WITH BOTTLED WATER AND HAS EVEN OFFERED TO BUY THEIR PROPERTY. OUR NEIGHBOR THAT HAS OVER 2.0 PPB OF CHROMIUM 6 HAS BEEN APPROACHED BY PG&E TO BUY THEIR PROPERTY – WATER TESTED AND PROPERTY SURVEYED. THUS EVEN PG&E MUST BELIEVE THAT THE AREA IN WHICH WE LIVE IN IS CONTAMINATED BY CHROMIUM 6. PG&E HAS ALL OF THIS INFORMATION BECAUSE THEY DID THE WATER TESTS ON THE WELLS.

ALSO, WE HAVE INCLUDED COPIES OF ITEMS THAT WE DISCUSSED AT HINKLEY MIDDLE SCHOOL ON OCT. 16, 2012. AND THE NAME & THE PHONE NUMBER OF THE MAN THAT STATED HE COULD CLEAN UP THE CHROMIUM 6 PLUME MUCH FASTER AND CLEANER (NO BY-PRODUCTS) WITH A PROCESS CALLED "ELECTROCOAGULATION". THIS IS OUR CHOICE FOR THE CLEAN-UP OF CHROMIUM 6.

IF YOU HAVE ANY QUESTIONS PLEASE FEEL FREE TO CONTACT US

THANK YOU,

Wanda S Monk

WANDA S. MONK

PACIFIC GAS & ELECTRIC COMPANY

PG and E + P.O. BOX 1060, BARSTOW, CA 92311 - (619) 253-2991

January 22, 1988

Wanda Monk

Dear Ms. Monk:

As part of a program to determine the chromium content in groundwater in a small area north of the PG&E Hinkley Compressor Station, water samples were taken from your well. The samples were analyzed by an independent, state-certified testing laboratory, Analytical Technologies, Inc., (ATI), in San Diego.

The attached laboratory report confirms that the water from your well contains less than 50 parts per billion (ppb) chromium. The U.S. Environmental Protection Agency and the State Department of Health Services have set the acceptable levels of chromium in drinking water at 50 parts per billion.

Should you have any questions regarding this laboratory report, please contact PG&E at (619) 253-2991 or the San Bernardino County Department Environmental Health Services at (714) 387-3044. Your cooperation with this testing program has been appreciated.

Sincerely,

Robert A. Cook
Manager, Southern Area
Pipe Line Operations

RAC/ce

Attachment
488-113-24

Pacific Gas and Electric Company

February 18, 1993

Wanda Monk

Dear Mrs. Monk:

At your request Pacific Gas and Electric Company (PG&E) sampled your well located at 34349 Mountain View Road in Hinkley earlier this month. PG&E had the water sample from your well analyzed for the presence of chromium. The laboratory analysis results are enclosed.

The water sample from your well is designated as Sample Number 1 on the report. The identification number for your well is DMR-1. The concentration of chromium reported by the laboratory for your well was less than .01 milligrams per liter (<0.01 MG/L). Since the minimum concentration that can be measured by the analysis method used by the laboratory is .01 milligrams per liter the laboratory report indicates that no chromium was detected in your well. The maximum concentration of chromium allowed in drinking water by California regulatory standards is .05 milligrams per liter. These results indicate that your well has not been significantly effected by the groundwater contamination near PG&E's compressor station in Hinkley.

If you have any further questions about the analysis results or would like more information please, call me at (619) 253-7879.

Sincerely,

Glen Riddle

Glen Riddle
Facility Engineer

Enclosure

Pacific Gas and Electric Company

José H. Moreno
Community Relations Manager
Hinkley Groundwater Remediation Project

August 16, 2012

Wanda Monk

Subject: Results of Water Well Sampling - July 2012
Well(s) #11-04 at 34655 Mountain View Rd., APN 0488-113-24

Dear Ms. Monk:

Thank you for participating in Pacific Gas and Electric Company's (PG&E) domestic well sampling program. The purpose of this letter is to provide you with the results of the July 2012 sampling effort. In addition, the attached table summarizes historical and current results.

Background

On July 18, 2012, samples were collected from the domestic well(s) on your property, well ID(s) #11-04. The samples were sent to Advanced Technology Laboratories, a California-certified laboratory, and analyzed for total chromium using U.S. Environmental Protection Agency (EPA) Method 6020A. The laboratory also analyzed the samples for hexavalent chromium using EPA Method 218.6.

The following are the results of the recent sampling:

For **Well #11-04** sampled on 07/18/2012:

- Total chromium was not detected
- Hexavalent chromium was detected at a concentration of: 0.36 parts per billion (ppb)

State and Federal Drinking Water Standards

The federal drinking water standard for total chromium is 100 parts per billion (ppb), and the California drinking water standard for total chromium is 50 ppb. Total chromium is the sum of all forms of chromium that may be present, including hexavalent chromium. Hexavalent chromium is currently regulated under the total chromium standard of 50 ppb.

Based on the results, the water from your well(s) is within the total chromium standard established by the California Department of Public Health for drinking water of 50 ppb and the Federal standard of 100 ppb.

Next Steps

The sampling results from July 2012 for your well ID(s) #11-04 will be included in our *Third Quarter 2012 Groundwater Monitoring Report,* to be submitted to the Water Board at the end of October 2012.

Please Contact Us With Your Question

Our local, bilingual (English/Spanish) staff is available to answer any questions about the sampling results for your well(s). Please contact Jessica Davtian at (855) 816-9722 or visit our Hinkley Community Resource Office located at 22999 Community Boulevard. We are open Monday through Friday from 9 a.m. to 5 p.m. If you are unable to visit us during these hours we'd be happy to schedule a time that is convenient for you. You may also contact us by e-mail at HinkleyInfo@pge.com.

Thank you very much for your participation in our program.

Sincerely,

cc: Jessica Davtian

cc: Current Tenant

Attachment: Table of historical and current results

Groundwater Sampling Results - July 2012

Well(s) #11-04 at 34655 Mountain View Rd., APN 0488-113-24

Well Number	Sample Date	Concentrations in parts per billion (ppb)		Drinking Water Standards for Total Chromium	
		Total Chromium Method 6020A	**Hexavalent Chromium** Method EPA 218.6	**Federal**	**State of CA**
11-04	Jul-18-2012	ND <1.0 (not detected)	0.36	100	50

Drinking Water Standard: The federal drinking water standard for total chromium is 100 ppb and the California drinking water standard for total chromium is 50 ppb. Total chromium is the sum of all forms of chromium that may be present, including hexavalent chromium. Hexavalent chromium is currently regulated under the total chromium standard of 50 ppb.

Key to Groundwater Sampling Results

-- Not Sampled

ND Not Detected

J A "J" shown next to a concentration indicates that the concentration is estimated based on data validation and quality control criteria

< The less than (<) symbol, if shown, in front of a result indicates that the compound was not detected (ND) in the groundwater sample. Analytical equipment is limited by its capability to detect a compound below a specific level, and this limit is expressed on the table with a less than (<) symbol in front of the number representing the concentration below which the instrument cannot measure.

Dan Hendrickson, President

Electrocoagulation system

Coolerado Indirect-Evaporative Air Conditioners
Waste-to-Energy Systems
Solar-Thermal Systems
Hot Water ADsorption Chillers™
Water and Wastewater Treatment
Sustainable Residential & Commercial Design


libre
ENERGY

Pacific Gas and Electric Company®

Jose H. Moreno
Community Relations Manager
Hinkley Groundwater Remediation Project

April 25, 2012

MONK, WANDA

Subject: **Voluntary Whole House Water Program**
34655 MOUNTAIN VIEW RD
HINKLEY, CA 92347

Dear Hinkley Property Owner:

In May of last year, Pacific Gas and Electric Company (PG&E) committed to doing a better job working with and listening to the Hinkley community. Since then, PG&E has been working with the Community Advisory Committee and listening carefully to Hinkley residents. We value the feedback we've received from community members and we are taking your comments to heart.

We've heard from families that, although they appreciate the bottled water we provide for drinking, they remain concerned about using their well water for other household purposes. The State of California is currently involved in a multi-year process for determining a drinking water standard specifically for chromium 6. Until that process is completed, we recognize that families in Hinkley will still have questions about whether their well water is safe.

Responding to input from members of the community and Community Advisory Committee, last August PG&E made a commitment to explore ways of providing replacement whole house water. We immediately hired experts and began a process to evaluate a range of replacement water alternatives, several of which were suggested by Community Advisory Committee members. We recently submitted a report to the Lahontan Water Board that recommends two approaches for providing whole house water.

Changes to PG&E's Water Provision Program in Hinkley

Later this year, PG&E will begin implementing a voluntary program to provide whole house water to eligible residents. **See fact sheet for eligibility requirements.** The details of this program will be refined over the next several months to reflect community input and work through installation and implementation issues. In the meantime, PG&E will be meeting with eligible residents beginning later this month to discuss the program. As soon as this plan is completed, for eligible residents who choose, we will provide a reliable water supply to their household that can be used for indoor uses such as drinking, cooking and bathing. For eligible residents who choose this option, this program will replace our bottled water program.

The water supply will come from one of two options which have been shown to provide reliable water supply for indoor domestic uses at levels below the current laboratory reporting limit for chromium 6 of 0.06 ppb:

- Drilling a deeper well (where feasible) on your property to draw water from the lower aquifer, or;
- Individual whole house systems that treat water at the well head (supplemented by small under-sink treatment systems)

Our commitment includes installation, maintenance and monitoring of the treatment systems until the State of California has adopted a drinking water standard specifically for chromium 6 (expected in the next 2 to 3 years), or for up to 5 years at which time the program will be evaluated to ensure that new studies and data can be considered. **See attached fact sheet for program details.**

To supplement this program of water provision, PG&E will consider purchasing the property of eligible residents who would prefer that option. **See attached fact sheet for program details.**

PG&E's willingness to offer this comprehensive program is the direct result of our discussions with the Community Advisory Committee and members of the community over the past year. We share the mutual goal of ensuring a safe, reliable water supply for the residents of Hinkley to ease their concerns for community health and well-being. We also share a commitment to a vision of a brighter future for the community of Hinkley.

Getting Started

Please see the attached fact sheet or call us to confirm your property's eligibility for this program. Eligible residents should contact us at (760) 253-7896 to schedule an appointment with PG&E staff to discuss the whole house water program. We will begin scheduling appointments for the week of April 30. Our goal is to provide reliable whole house water for you and your family. However, we understand that every family's needs are different and the whole house water program may not be right for every eligible property owner. If this is the case for you, at your request, PG&E will offer to purchase your property following an appraisal.

For More Information

Our local, bilingual (English/Spanish) staff is available to answer any questions you have about PG&E's programs. If you have questions about your eligibility for whole house replacement water programs or would like your well tested by PG&E, please contact us at (760) 253-7896 by email at HinkleyInfo@pge.com or visit our Hinkley Community Resource Office located at 22999 Community Boulevard. We are open Monday through Friday from 9 a.m. to 5 p.m. If you are unable to visit us during these hours we'd be happy to schedule a time that is convenient for you.

Sincerely,

Jose H. Moreno

Pacific Gas and Electric Company

Jose H. Moreno
Community Relations Manager
Hinkley Groundwater Remediation Project

April 27, 2012

Subject: Voluntary Whole House Water Program

Dear Resident:

In May of last year, Pacific Gas and Electric Company (PG&E) committed to doing a better job working with and listening to the Hinkley community. Since then, PG&E has been working with the Community Advisory Committee and listening carefully to Hinkley residents. We value the feedback we've received from community members and we are taking your comments to heart.

We've heard from families that, although they appreciate the bottled water we provide for drinking, they remain concerned about using their well water for other household purposes. The State of California is currently involved in a multi-year process for determining a drinking water standard specifically for chromium 6. Until that process is completed, we recognize that families in Hinkley will still have questions about whether their well water is safe.

Responding to input from members of the community and Community Advisory Committee, last August PG&E made a commitment to explore ways of providing replacement whole house water. We immediately hired experts and began a process to evaluate a range of replacement water alternatives, several of which were suggested by Community Advisory Committee members. We recently submitted a report to the Lahontan Water Board that recommends two approaches for providing whole house water.

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Later this year, PG&E will begin implementing a voluntary program to provide whole house water to eligible residents. **See fact sheet for eligibility requirements.** The details of this program will be refined over the next several months to reflect community input and work through installation and implementation issues. In the meantime, PG&E will be meeting with eligible residents beginning later this month to discuss the program. As soon as this plan is completed, for eligible residents who choose, we will provide a reliable water supply to their household that can be used for indoor uses such as drinking, cooking and bathing. For eligible residents who choose this option, this program will replace our bottled water program.

The water supply will come from one of two options which have been shown to provide reliable water supply for indoor domestic uses at levels below the current laboratory reporting limit for chromium 6 of 0.06 ppb:

- Drilling a deeper well (where feasible) on your property to draw water from the lower aquifer, or;
- Individual whole house systems that treat water at the well head (supplemented by small under-sink treatment systems)

Our commitment includes installation, maintenance and monitoring of the treatment systems until the State of California has adopted a drinking water standard specifically for chromium 6 (expected in the next 2 to 3 years), or for up to 5 years at which time the program will be evaluated to ensure that new studies and data can be considered. **See attached fact sheet for program details.**

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Getting Started

Please see the attached fact sheet or call us to confirm your property's eligibility for this program. Eligible residents should contact us at (760) 253-7896 to schedule an appointment with PG&E staff to discuss the whole house water program. We will begin scheduling appointments for the week of April 30. Our goal is to provide reliable whole house water for you and your family. However, we understand that every family's needs are different and the whole house water program may not be right for every eligible property owner. If this is the case for you, at your request, PG&E will offer to purchase your property following an appraisal.

For More Information

Our local, bilingual (English/Spanish) staff is available to answer any questions you have about PG&E's programs. If you have questions about your eligibility for whole house replacement water programs or would like your well tested by PG&E, please contact us at (760) 253-7896 by email at HinkleyInfo@pge.com or visit our Hinkley Community Resource Office located at 22999 Community Boulevard. We are open Monday through Friday from 9 a.m. to 5 p.m. If you are unable to visit us during these hours we'd be happy to schedule a time that is convenient for you.

Sincerely,

Jose H. Moreno

Pacific Gas and Electric Company
Groundwater Remediation Program

April 2012

Whole House Water Program Fact Sheet

Pacific Gas and Electric Company (PG&E) has been listening to the concerns of Hinkley residents regarding their domestic well water. The State of California is in the process of determining a safe drinking water standard specifically for chromium 6. PG&E understands that while that process is underway, the community continues to have questions about whether their well water supplies are safe. In response to these concerns and as part of PG&E's commitment to the community, PG&E is offering a voluntary program to provide whole house water to eligible residents.

Whole House Water Program

For eligible residents who choose to participate, PG&E's whole house water program will provide a reliable water supply to your household that can be used for indoor uses such as drinking, cooking and bathing. This program will replace our bottled water program.

As part of the program, PG&E will pay for one of the following two whole house water options (including installation, maintenance and monitoring of the systems):

- Drilling a deeper well (where feasible) on your property to draw water from the lower aquifer;
- Individual whole house systems that treat water at the well head (supplemented by small under-sink treatment systems)

These options have been shown to provide reliable water supply for indoor domestic uses at levels below the current laboratory reporting limit for chromium 6 of 0.06 ppb. Because every domestic well and residence is different we will work with you to understand which program option is the best fit.

Property Purchase Option

Our goal is to provide reliable whole house water for you and your family. However, we understand that every family's needs are different and the whole house water program may not be right for every eligible property owner. If this is the case for you, at your request, PG&E will offer to purchase your property following an appraisal. All property purchase transactions are confidential, so please call us to schedule an appointment if you would like more information.

Program Eligibility

In order to be eligible for the whole house water program or property purchase option, your residence must meet all of the following criteria:

- The property has a residence with an active domestic well and is located within one mile of the Fourth Quarter 2011 chromium 6 plume (see figure next page); and
- The domestic well has been tested by PG&E within the last six months with results for chromium 6 levels greater than non-detect. If your well has not been recently tested by PG&E, please call us to schedule an appointment to have your well tested at no charge to you.

Important note: *property owner consent is required for well testing and all Whole House Water options.*

Whole House Water Program Term

PG&E's whole house water program will be offered for a period of up to 5 years or until the State of California has adopted drinking water standard specifically for Chromium 6. The process of developing the drinking water standard is currently underway and is anticipated to take two to three years. Upon the adoption of the California drinking water standard for chromium 6, or no later than 5 years from implementation, PG&E will review the whole house water program, utilizing all available information to determine the future of the program.

Getting Started

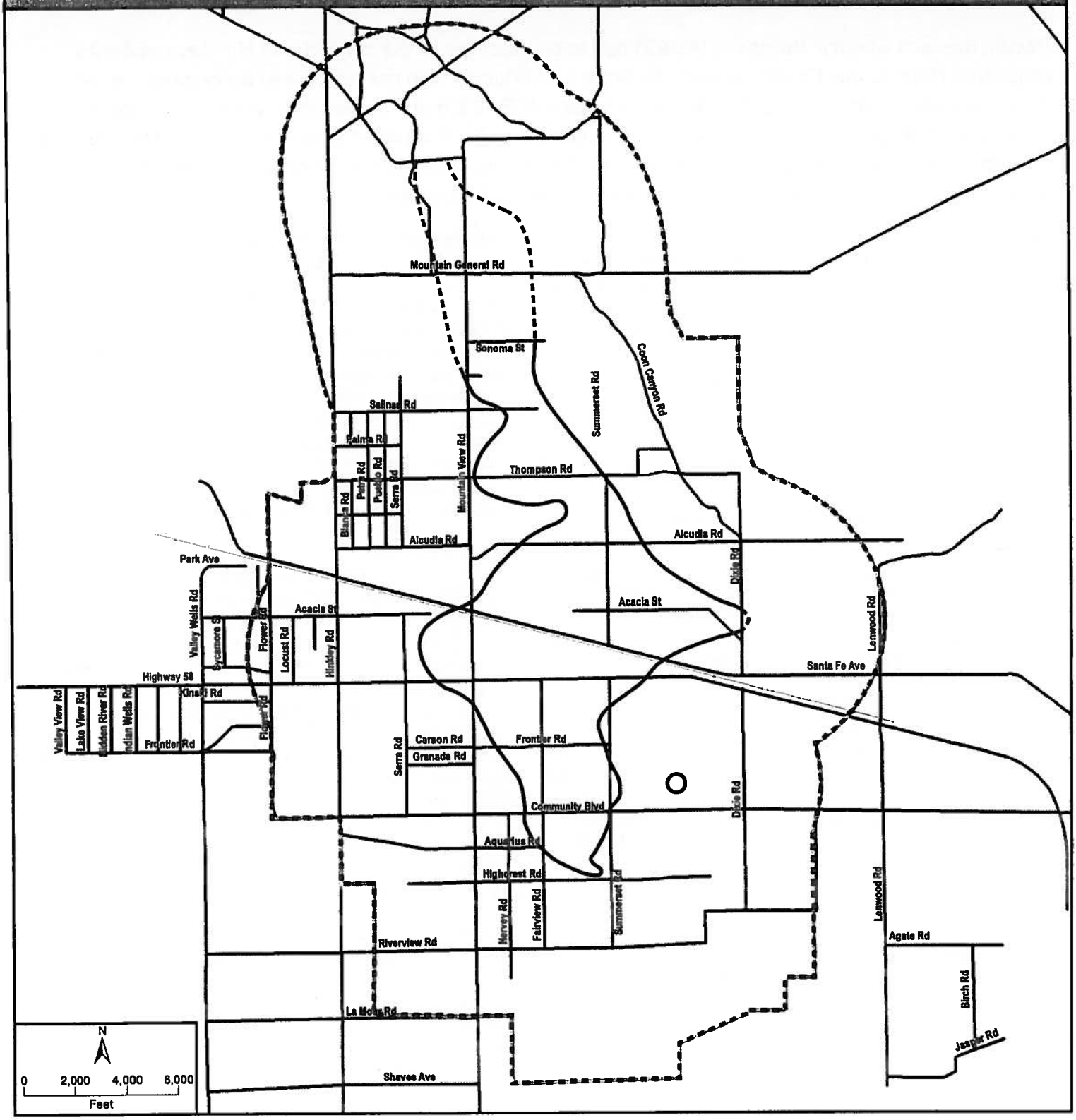
Eligible residents should contact us at (760) 253-7896 to schedule an appointment with PG&E staff to discuss the whole house water program. We will begin scheduling appointments for the week of April 30. We are committed to meeting with you and your family to share the details of our program with you and answer all your questions. We are asking eligible residents to let us know which option they would like to pursue, either whole house water or property purchase, on or before August 31, 2012. For residents that select the whole house water option, our goal is to begin installation of the systems or being drilling deeper wells this fall. For residents that select the property purchase option, our goal will be to work with you to complete the purchase by end of the year. At the end of 2012, PG&E's property purchase program in Hinkley will come to a close, except in select instances where the property is needed for remediation purposes.

For More Information

Our local, bilingual (English/Spanish) staff is available to answer any questions you have about PG&E's programs. If you have questions about your eligibility for the whole house water program or would like your well tested by PG&E, please contact us at (760) 253-7896 by email at HinkleyInfo@pge.com or visit our Hinkley Community Resource Office located at 22999 Community Boulevard. We are open Monday through Friday from 9 a.m. to 5 p.m. If you are unable to visit us during these hours we'd be happy to schedule a time that is convenient for you.

Whole House Water Program Fact Sheet

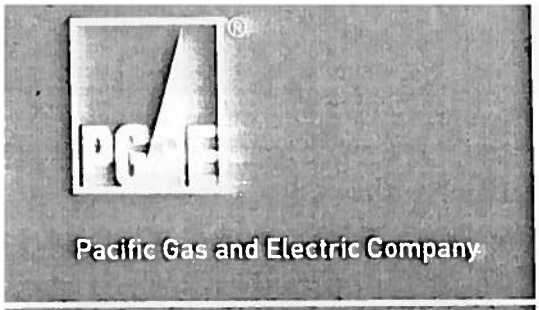
Whole House Water Program Area



LEGEND

Approximate outline of Cr(VI) or Cr(T) in Upper Aquifer exceeding background values of 3.1 and 3.2 µg/L, respectively, Fourth Quarter 2011

Whole House Water Program Area Boundary



PG&E
22999 Community Blvd.
Hinkley, CA 92347

PRSRT STD
US POSTAGE
PAID
SACRAMENTO CA
PERMIT NO. 1890

August 2012

Hinkley Whole House Replacement Water Program

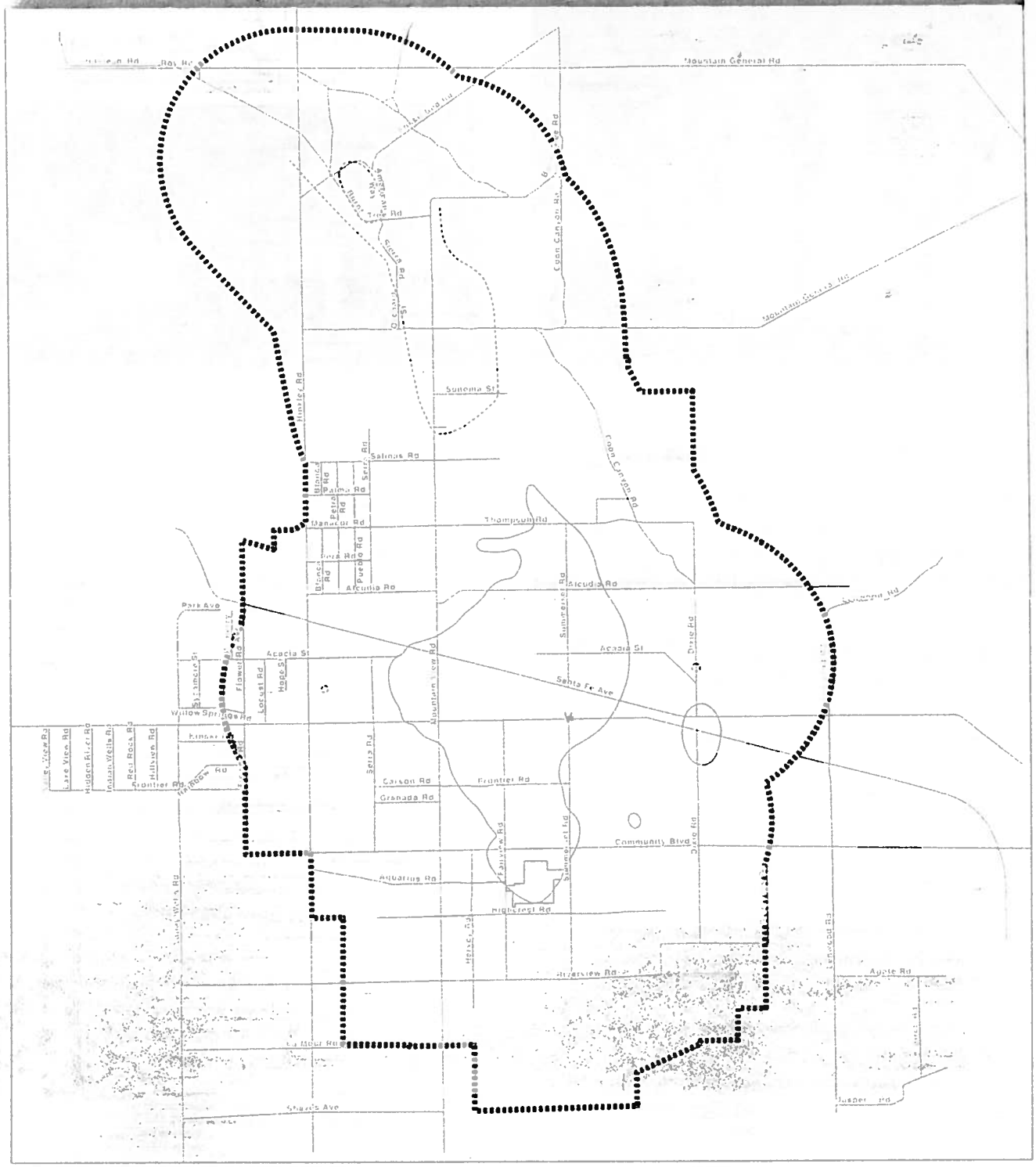
3/1/321
Wanda Monk

Important: Whole House Replacement Water Program Information

If you have not yet spoken with PG&E regarding your eligibility for Whole House Replacement Water, please contact us at (760) 253-7896, by email at HinkleyInfo@pge.com or visit our Hinkley Community Resource Office located at 22999 Community Blvd. We are open Monday through Friday from 9 a.m. to 5 p.m. Our local and bilingual (English/Spanish) staff is available to answer any question you may have about PG&E's programs.

Thank you.

Whole House Replacement Water Program Area



LEGEND

Approximate outline of Cr(VI) or Cr(T) in Upper Aquifer exceeding background values of 3.1 and 3.2 µg/L, respectively, Second Quarter 2012

Whole House Water Program Area Boundary (Third Quarter 2012)

MOJAVE BASIN AREA
WATERMASTER

FOR
CITY OF BARSTOW, ET AL, VS. CITY OF ADELANTO, ET AL,
CASE NO. 208568 - RIVERSIDE COUNTY SUPERIOR COURT

October 1, 2012

Wanda Monk

RE: Ordinance 11

Ms. Monk,

Under the Minimal Producers Program (Ordinance 11), you would be allowed to pump up to 10 acre feet on your property for domestic use. This amount is non-transferable and non-negotiable, regardless of acreage owned. For your convenience I have attached some more information regarding the Minimal Producers Program.

If you have any more questions, please feel free to contact me.

Kindest Regards,

Brenton Laidler
Watermaster Services Technician II

Enclosures: Ordinance No. 11 Packet,
FAQ about the Minimal Producers Program

ORDINANCE NO. 11

AN ORDINANCE OF THE MOJAVE WATER AGENCY FOR REGULATION OF MINIMAL PRODUCERS AND ESTABLISHING THE MINIMAL PRODUCERS PROGRAM

WHEREAS the Board of Directors of the Mojave Water Agency (MWA) hereby finds:

1. The Mojave Water Agency in *City of Barstow, et al. v. City of Adelanto, et al.* (Riverside Superior Court #208568) is directed to implement a Minimal Producers Program for water wells or facilities that produce up to ten acre-feet per water year. Such a Program "shall achieve an equitable allocation of the costs of the Physical Solution that are attributable to Production" by Minimal Producers.

2. The Judgment in *City of Barstow, et al. v. City of Adelanto, et al., supra*, enjoins any water production within the Mojave Basin except pursuant to the provisions of the Judgment and the Minimal Producers Program adopted by MWA and approved by the Court after entry of Judgment. MWA began the Minimal Producers Program in order to better understand water use by Minimal Producers and their impact upon the Basin. Through the program MWA has catalogued thousands of wells and accumulated data on water use by Minimal Producers. MWA continues to gather and analyze data regarding water use by Minimal Producers.

3. After undertaking this process the Board of Directors has determined that the pools for Minimal Producers established in the Judgment are sufficient for existing Minimal Producers. The Board of Directors has also determined that these pools have been exhausted and it is necessary to establish a program to regulate new Minimal Producers. Furthermore, given the thousands of wells and the vast number of Minimal Producers already identified by MWA, the Board of Directors finds that it would be too costly for MWA to attempt to manage a program that encompasses all Minimal Producers. New Minimal Producers are readily identifiable. Therefore, the Board of Directors has determined that it is necessary to distinguish between Minimal Producers existing before April 1, 2000 and after. This distinction is necessary because:

   a. The Mojave Basin is currently in a state of overdraft;

   b. All new production by Minimal Producers starting on or after April 1, 2000 will contribute to the overdraft and such production needs to be regulated in order to assure an adequate water supply within the Basin;

   c. The Minimal Producers Program will take effect April 1, 2000; and

   d. The Judgment allows for the distinction.

4. In order to acquire more supplemental water to recharge the Mojave Basin, the Board of Directors finds that it has become necessary to implement an annual Minimal Producers Fee that shall only be applicable to those Minimal Producers whose production begins on or after April 1, 2000.

Be it ordained by the Board of Directors of the Mojave Water Agency as follows:

CLASSIFICATION OF MINIMAL PRODUCERS UNDER THE JUDGMENT IN THE *CITY OF BARSTOW, ET AL. V. CITY OF ADELANTO, ET AL.* (RIVERSIDE SUPERIOR COURT #208568) AND ESTABLISHMENT OF THE MINIMAL PRODUCERS PROGRAM:

Section 1. Definition of Minimal Producers. Minimal Producers are defined in the Judgment as "Any Person whose Base Annual Production, as verified by MWA is not greater than ten (10) acre-feet" and who has not stipulated to the Judgment. A Person designated as a Minimal Producer whose Annual Production exceeds ten (10) acre-feet in any year following the date of entry of Judgment is no longer a Minimal Producer and is subject to the terms of the Judgment.

Section 2. Minimal Producers Fee. A Minimal Producers Fee shall be paid each year to MWA by every Minimal Producer whose water production began on or after April 1, 2000. The Minimal Producers Fee shall be the then going rate for one acre foot of aqueduct water charged to MWA by the State of California, plus any transportation costs established by the Board of Directors. The Minimal Producers Fee is a charge for water and is not a parcel charge. The Minimal Producers Fee shall be collected in the same manner, by the same persons, at the same time as, and together and not separately from, the collection of annual county ad valorem property taxes imposed upon real property. Failure to pay the fee on time shall subject the Minimal Producer to an additional penalty charge of $25.00. Minimal Producers Fees not paid shall be considered delinquent and MWA may collect this amount as a lien on the San Bernardino County tax rolls.

Section 3. Exemption of Minimal Producers existing prior to April 1, 2000. Minimal Producers who began water production prior to April 1, 2000 shall not be subject to the Minimal Producers Fee, pursuant to the Agency Act, but records will be maintained and catalogued by MWA regarding pre-April 1, 2000 Minimal Producers. All Minimal Producers whose well permit applications were deemed approved by the San Bernardino County Department of Public Health on or before March 31, 2000 shall not be subject to the Minimal Producers Fee. Replacement wells for Minimal Producers existing prior to April 1, 2000 also shall not be subject to the Minimal Producers Fee.

Section 4. Funds used to purchase supplemental water. All funds collected by MWA pursuant to Minimal Producers water charges, including penalty fees, shall be used exclusively to acquire supplemental water to help recharge the Mojave Basin area. MWA shall keep all funds collected under this Program separate from other funds and MWA shall provide an annual financial report on the status of these funds. Water charges from each sub-area will be used for water deliveries in that sub-area.

Section 5. Minimal Producers production non-transferable. Minimal Producers not subject to the Judgment shall be confined to the parcel on which the water production facility exists. Such Minimal Producer's status would transfer on any sale or alienation of that property or parcel.

Section 6. Monitoring Wells, Rules and Regulations. MWA staff is authorized to monitor wells to assure compliance and establish rules and regulations to implement the Program.

Section 7. Annual Production greater than ten acre-feet. Any Minimal Producer who produces more than ten acre-feet in any given year shall no longer be considered a Minimal Producer and shall become a Party subject to the provisions of the Judgment.

Section 8. Enforcement. The Board of Directors may direct staff to bring a civil action seeking enforcement, including injunctive relief, of the provisions of this Ordinance. This enforcement provision is in addition to all other enforcement provisions, including those in the Agency Act, the Judgment, and otherwise provided by law.

Section 9. Severability. If any section, sentence, clause or phrase of this Ordinance is for any reason held to be invalid or unconstitutional by the decision of a court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Ordinance. The Board of Directors declares that it would have passed this Ordinance, and each section, subsection, clause, sentence or phrase thereof irrespective of the fact that any one or more other sections, subsections, clauses, sentences or phrases may be declared invalid or unconstitutional.

Section 10. Effective Date. This Ordinance shall be in full force and effect upon April 1, 2000, and shall be published in full in a newspaper of general circulation within ten (10) days from the date of adoption.

Passed and adopted this 25th day of January, 2000, by the following vote:

Ayes: Directors Almond, Fortyune, Hall, Lowry, Parker, Stringer and Weldy
Noes: None
Abstain: None
Absent: None

George R. Parker
President, Board of Directors

ATTEST:

Scott Weldy
Secretary, Board of Directors

Mojave Water Agency

FREQUENTLY ASKED QUESTIONS ABOUT THE MINIMAL PRODUCERS PROGRAM

Q.

A.: The Minimal Producers Program is an administrative program that has been developed by the Mojave Water Agency to account for minimal producers—those entities pumping 10 acre-feet or less of groundwater per year.

Q.

A.: The majority of the MWA is experiencing groundwater overdraft. That is, more groundwater is used each year than is replaced by nature. The development of a Minimal Producers Program was required by court action as described in the Mojave River Basin Adjudication.

Q.

A.: The MWA estimates there are up to 6,500 minimal producer wells in the Mojave River Basin and is checking their operational status, specific location and amount of production. The Minimal Producer Ordinance, adopted by the MWA Board on January 25, 2000, will apply only to well owners within the boundaries of the Mojave Basin Area Adjudication who produce 10 acre-feet or less of water per year, and did not stipulate to the Judgment. ***However, it still has to receive final approval from Riverside Superior Court Judge Michael Kaiser, as a result of a 1990 lawsuit, which is currently pending. If and when this Ordinance is approved by the Riverside Superior Court, you will be notified.***

Q.

A.: No. The MWA does not require water meters for currently known minimal producers.

Q.

A.: Yes, a fee will be collected every year from Minimal Producers who begin water production after March 31, 2000. Conversely, the fee would **not** be applicable to Minimal Producers that produced water on or prior to that date. Each Minimal Producer subject to the fee would pay for one acre-foot of water per year in accordance with the supplemental water rates adopted by the Board of Directors, specific to the subarea in which the Minimal Producer is located. The fees collected will be used to purchase supplemental water for the subarea from which the fees were collected.

Q.

A.: April 1, 2000. The Minimal Producer status will be determined by the date that a well permit application was deemed approved by the San Bernardino County Department of Public Health. Any Minimal Producer filing for a well permit after April 1, 2000 or who does not have an approved well permit by that date will be subject to the Minimal Producer fee once water production begins.

Q.

A.: Yes. Replacement wells for Minimal Producers existing prior to April 1, 2000 shall not be subject to the Minimal Producers fee. Minimal Producer status shall be confined to the parcel on which the water production facility exists and would remain with the new property owner upon change of ownership.

Q.

A.: You can visit the Mojave Water Agency Website at: www.MojaveWater.org, or call (760) 946-7000 or (800) 254-4242 during business hours.

Mojave Water Agency

David Seielstad
Senior Watermaster Technician

V CARD

WEBSITE

Mojave Water Agency Mission:

To manage the region's water resources for the common benefit to assure stability in the sustained use by the citizens we serve.

Put a stop order on ethanol NOW

Let ~~PGTE~~ USGS Proue ethanol is not Releasing

Manganese In to aquifer.

Robert L Morris,

Ms. Laurie Kemper
Ms. Ann Holden
California Regional Water Quality Control Board
Lahontan Region
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

Dear Ms. Kemper and Ms. Holden:

At the Tuesday EIR meeting one of you stated that it was your belief that the flood of 2010 released manganese into the water in Hinkley. For your information, I have lived in Hinkley, CA since 1961. I have seen many floods on the Mojave River. I have never heard before of any black water from any flood. There has never been manganese released into the houses of Hinkley before. If you check your USGS maps you will find there is no manganese. During the flood of 1968/69 water flowed all the way from the Mojave River through PG&E's property to the Lenwood Road crossing of the Santa Fe tracks (the Barstow to Mojave feed). This flood rolled a train completely off the tracks at Lenwood Rd, before continuing all the way to Harper Lake. Before this flood, the first street bridge with the little rock it ties into on the North side of the river; there was an island with houses on the west side of it. These houses have not been seen since. At Lenwood Rd. the water was flowing 14 feet deep, bank to bank. 144 feet a second crossed Lenwood Rd. Santa Fe had to park a loaded train on top of the old railroad bridge to keep it from bouncing. This was the largest flood I remember on this river and I have seen many. And none of these floods have brought out your black water manganese before. The first time I heard of black water in Hinkley was 2 years ago when Nick Grill asked me if I had ever seen black water out here before. As I told him then, I will tell you now...I have never heard of black water before! The manganese that we are now seeing in this water is the fault of Lahontan Water and Pacific Gas and Electric. Comparing the 2010 flood with the big floods of 67, 68 & 69 the flood of 1978, 83 and many others; the flood of 2010 was the weakest flood of them all.

Long before PG&E was allowed to pump the ethanol into the ground, you should have dumped a million gallons of food coloring into the wells that would have no side effects and no heavy metals to see where this water flowed. You have completely failed in the protection of the people of Hinkley. If gross polluters had to register like pedophiles, Lahontan Water Board's name would be right there with PG&E's. Lahontan Water Board should not be in charge of any clean-ups. They do not have the expertise or the knowledge to handle such tasks. In the 30 years they've been in charge of this mess they have failed.

Sincerely,

Robert L. Morris

October 14, 2012

Ann Holden
California Regional Water Quality Control Board
Lahontan Region
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

Dear Ms. Holden:

In response pertaining to the Hinkley, CA/PG&E clean up (EIR):

My highest concern is a total disregard for following EPA regulations and California Department of Public Health regulations.

EIR 3.3-12 line 41states that manganese is not considered toxic.

EPA and CDPH studies on manganese:

http://www.epa.gov/ogwdw/ccl/pdfs/reg_determine1/support_cc1_magnese_dwreport.pdf

www.cdph.ca.gov/certlic/drinkingwater/pages1manganese.aspx

Both these studies show manganese to be very toxic above 50 parts per billion. Arsenic is at 10 parts per billion. (See report above with arsenic replacing the word manganese.)

Our well at 21876 Pioneer Rd., Hinkley, CA 92347 has 5600 ppb of manganese and 19 ppb of arsenic. See E. S. Babcock report attached.

We also own property on Flower Street in Hinkley, parcel #049428202 which has manganese at 1300 ppb and arsenic at 56 ppb. See E. S. Babcock report attached.

Our house is 1 and 3/4 miles west of PG&E. Our property is 3 miles west of PG&E.

PG&E has been studying the water flow of Hinkley and their chromium 6 plume for well over 50 years. PG&E should be removed from the studies and cleanup and all their data and EIR report should be disregarded. The USGS and Army Corps of Engineers should be put in charge of collecting data and clean up to ensure that this problem is dealt with and cleaned up properly.

Furthermore, all water should be removed from the ground, cleaned and replaced.

Sincerely,

Robert and Karla Morris

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name:Terawatt Construction Inc.
Contact:Nick Grill

Analytical Report: Page 3 of 3
Project Name: No Project
Project Number: --PAID--Cr

Work Order Number: B2I2778

Report Date:08-Oct-2012

Received on Ice (Y/N): No Temp: 24°C

Notes and Definitions

Nconf	Result(s) confirmed by re-analysis.
ND:	Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit
* / '" :	NELAP does not offer accreditation for this analyte/method/matrix combination

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted. Babcock Laboratories and its officers and employees assume no responsibility and make no warranty, express or implied, for uses or interpretations made by any recipients, intended or unintended, of this report.

Lauren G. Tyner
CN = Lauren G. Tyner C = US O = Babcock Laboratories, Inc. OU = Project Manager
2012.10.08 11:57:42 -07'00'

cc:

e-Tab_Summary.rpt

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1900

Client Name:Terawatt Construction Inc.
Contact:Nick Grill

Analytical Report: Page 2 of 3
Project Name: No Project
Project Number: --PAID--Cr

Work Order Number: B2I2778

Report Date:08-Oct-2012

Received on Ice (Y/N): No Temp: 24°C

	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
B2I2778-01 *Sampled: 09/26/12 13:30*							
#1 Flower St.							
Arsenic	6.6	2.0	ug/L	EPA 200.8	10/01/12 23:01	AAV	
Manganese	29	20	ug/L	EPA 200.8	10/01/12 23:01	AAV	
B2I2778-02 *Sampled: 09/26/12 13:30*							
#2 Flower St.							
Arsenic	54	1.0	ug/L	EPA 200.8	10/05/12 11:15	AAV	Nconf
Manganese	1300	40	ug/L	EPA 200.8	10/01/12 23:44	AAV	
B2I2778-03 *Sampled: 09/26/12 13:30*							
21876 Pioneer Rd., Hinkley							
Arsenic	19	4.0	ug/L	EPA 200.8	10/01/12 23:45	AAV	Nconf
Manganese	5600	250	ug/L	EPA 200.8	10/05/12 13:27	AAV	

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name:Terawatt Construction Inc.
Contact:Nick Grill

Report Date:08-Oct-2012

Project Name: No Project
Project Number: --PAID--Cr

Work Order Number: B2I2778

Received on Ice (Y/N): No Temp: 24°C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

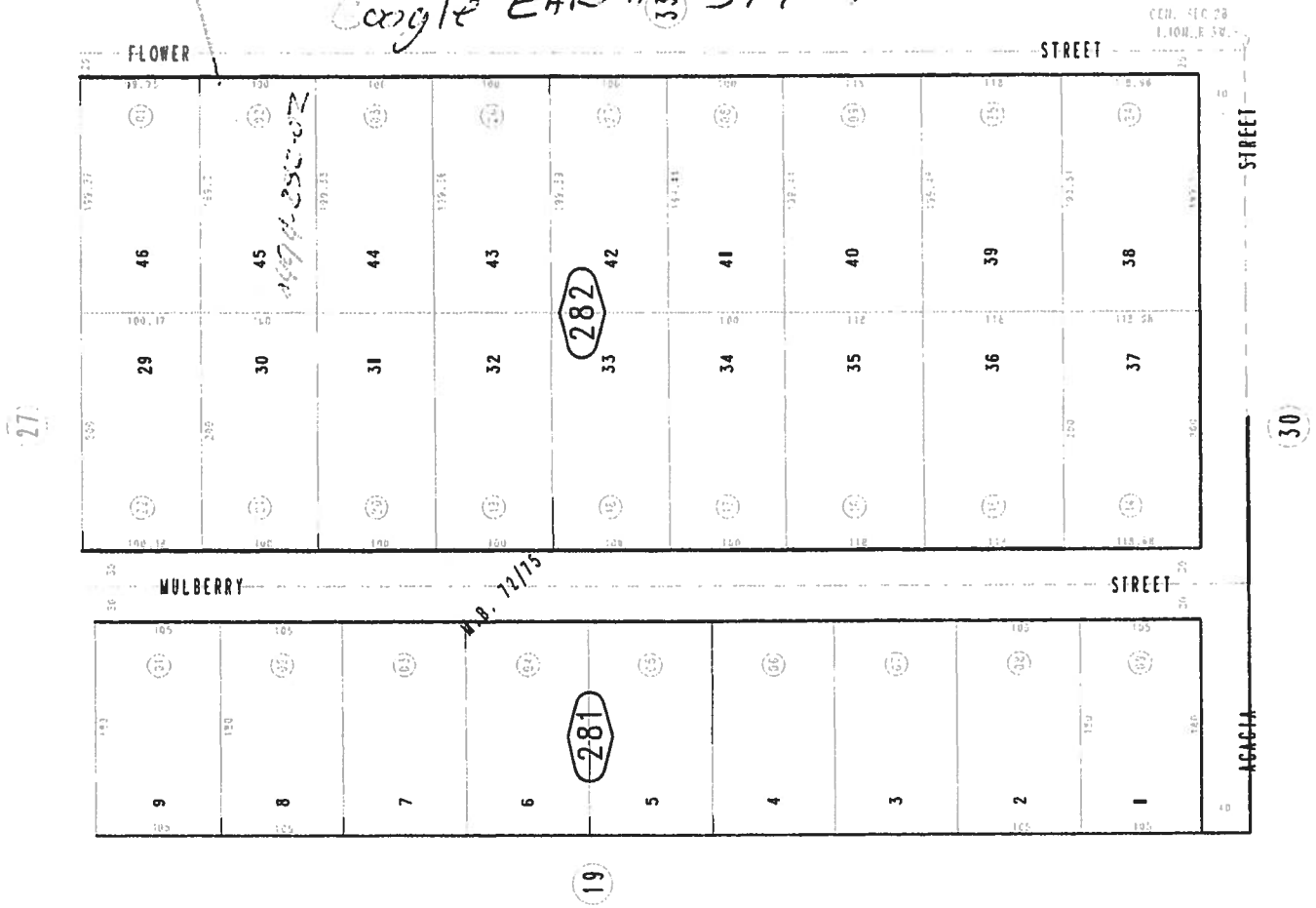
Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B2I2778-01	#1 Flower St.	Water	09/26/12 13:30	Client	09/26/12 15:50	Nick
B2I2778-02	#2 Flower St.	Water	09/26/12 13:30	Client	09/26/12 15:50	Nick
B2I2778-03	21876 Pioneer Rd., Hinkley	Water	09/26/12 13:30	Client	09/26/12 15:50	Nick

Ptn. Tract No. 5714, M.B. 72/75

Barstow Unified
Tax Rate Area
56109

0494 – 28

1300 PPB Manganese
54 PPB ARSENIC.
Eagle EARTH 37424 Flower



February 2004

Ptn. E.1/2, Sec. 28
T.10N., R.3W.

Assessor's Map
Book 0494 Page 28
San Bernardino County

You can see how dirty the water is on 9/27/2012

This is PVC pipe. It is white pipe. You can see black manganese stuck to the water pump on 9/27/2012.

We purchased this property October of 2010.

Before purchase we had the water checked by two independent environmental laboratories; E. S. Babcock, Riverside, CA, and B. C. Labs, Bakersfield, CA. Both tests came back 0 for Chromium 6.

Our well was clean for first 9 months and then PG&E started testing. First test was .08, second test was .1, third test was .18. Now we have manganese at 5600 parts per billion (ppb) and arsenic at 19 ppb.

In less than 2 years our water has gone from perfectly healthy to hazardous waste.

Robert Morris

October 16, 2012

Laurie Kemper
California Regional Water Quality Control Board
Lahontan Region
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

Dear Ms. Kemper:

I believe that the Hinkley CA Water Clean-up EIR should be thrown out.

This EIR 3.3-12, line 41states that manganese is not considered toxic.

The following two reports:
http://www.epa.gov/ogwdw/ccl/pdfs/reg_determine1/support_cc1_magnese_dwreport.pdf and www.cdph.ca.gov/certlic/drinkingwater/pages1manganese.aspx report manganese to be very toxic and deadly above 50 parts per billion (ppb).

EIR 3.3-13 line 1 states that Arsenic at 5000 ppb would be standard. www.epa.gov/drink/index and www.cdph.ca.gov/certlic/drinkingwater/pages1arsenic.aspx states that arsenic above 10 ppb is toxic.

Once a gross polluter, i.e., PG&E, is allowed to lower the EPA/CDPH standards, the standards are never returned to safe levels. www.ewg.org/book/export/html/8626 states that. PG&E and Dennis Paustenbach, founder and president of ChemRisk, destroyed the first and only CR_6 study over 30 years ago.

Plume boundaries: Lahontan and PG&E place the west boundary of the plume at Mountain View Rd in Hinkley , CA.

Don and Jackie Depue, 36227 Hinkley Rd, Hinkley, CA have a Hexavalent chromium level of 7.8 parts per billion, per water test. Bob and Karla Morris, 21876 Pioneer Rd, Hinkley, CA show manganese at 5600 ppb and arsenic at 19 ppb, per their latest water test. These prove that the plume boundary should at Hinkley Rd. Floyd Burns, 37362 Mulberry Ave, Hinkley, CA water test in 1987 shows total chrome at 10 ppb.

Quoting Ian Webster, IRP Manager, "If total chrome is 10 ppb, Hexavalent chrome would be 9.5 ppb".

Bob and Karla Morris' property on Flower St., (site of the old Hinkley Water CO. or parcel # 049428202) reports manganese at 1300 ppb and arsenic at 56 ppb. These two are witness that the west plume boundary should be at Mulberry Avenue or that the plume should be 2 1/4 miles west of Mountain View Rd.

Therefore, I believe the Lahontan Water Board and Pacific Gas & Electric should be released and removed from Hinkley water clean-up. Lahontan Water Board should be replaced by the USGS for data collection and interpretation, who without prejudice would give us a real plume boundary. PG&E should be replaced by the Army Corps of Engineers who are used to cleaning up other peoples messes; to purge the Hinkley aquifer of all contamination and would follow the Environmental Protection Agency and the California Department of Public Health standards.

Sincerely,

Robert and Karla Morris

October 24, 2012

Ann Holden
California Regional Water Quality Control Board
Lahontan Region
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

Ms. Holden::

Remediation needs to stop now. There should be no more ethanol injected in to the Aquifer/drinking water in Hinkley Ca. PG&E and Lahontan water have failed to control manganese and arsenic.

The plume boundary needs to be redefined. This is the latest water test for my property on flower street; parcel #049428202. This should be easy for you to check because Lahontan Water did a water test the same day.

Robert and Karla Morris

Stop EIR Now
R J Morris

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories since 1909

Client Name:Morris, Bobby
Contact:Bobby Morris

Report Date:23-Oct-2012

Analytical Report: Page 2 of 4
Project Name: No Project
Project Number: --PAID--Cr

Work Order Number: **B2J1452**
Received on Ice (Y/N): No Temp: 20°C

	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
B2J1452-01 *Sampled: 10/11/12 10:30*							
#1 049428202							
Arsenic	170	40	ug/L	EPA 200.8	10/19/12 17:01	AAV	N_noH, Nconf
Manganese	140000	5000	ug/L	EPA 200.8	10/19/12 15:15	AAV	