



Linda S. Adams  
Secretary for  
Environmental Protection



## Department of Toxic Substances Control

Maureen F. Gorsen, Director  
5796 Corporate Avenue  
Cypress, California 90630



Arnold Schwarzenegger  
Governor

Sent Via E-mail

January 18, 2008

Ms. Yvonne Meeks  
Portfolio Manager – Site Remediation  
Pacific Gas and Electric Company  
4325 South Higuera Street  
San Luis Obispo, CA 93401

COMMENTS ON THE ECOLOGICAL EXPOSURE PARAMETERS,  
BIOACCUMULATION FACTORS, AND TOXICITY REFERENCE VALUES, PACIFIC  
GAS AND ELECTRIC COMPANY (PG&E), TOPOCK COMPRESSOR STATION,  
NEEDLES, CALIFORNIA (EPA ID NO. CAT080011729)

Dear Ms. Meeks,

The Department of Toxic Substances Control (DTSC) has completed review of the document *Ecological Exposure Parameters, Bioaccumulation Factors, and Toxicity Reference Values, PG&E Topock Compressor Station, Needles, California* (Report). The Report is dated June 19, 2007 and was prepared by Arcadis BBL on behalf of PG&E. DTSC's Human and Ecological Risk Division (HERD) has prepared comments on the Report which were provided to PG&E via e-mail on January 9, 2008 and are enclosed. We request that PG&E take these comments into consideration during preparation of the Soil and Groundwater Risk Assessment Work Plan to be submitted to DTSC on February 21, 2008.

As noted in the enclosed memorandum from Dr. Eichelberger, the Report offers bioaccumulation factors and toxicity reference values for inorganic Chemicals of Potential Concern (COPECs) only. DTSC notes that one of the goals of the upcoming Soil Sampling Part A and Part B site characterization effort is to determine the full list of organic Constituents of Potential Concern. For this reason, PG&E may defer bioaccumulation factors and toxicity reference values for organic Chemicals of Potential Concern (COPECs) to an Addendum to the Soil and Groundwater Risk Assessment Work Plan after evaluation of data collected during the Soil Sampling Part A and Part B Phase I characterization effort. This Addendum should include bioaccumulation factors and toxicity reference values for any additional organic Chemicals of Potential Concern (COPECs) identified during the Soil Sampling Part A and Part B Phase I characterization and is due to DTSC on June 12, 2009.

Ms. Yvonne Meeks  
January 18, 2008  
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If you have any questions or comments regarding this letter, please contact me at  
(714) 484-5439.

Sincerely,

A handwritten signature in black ink that reads "Karen Baker". The signature is fluid and cursive, with the first name "Karen" and last name "Baker" clearly distinguishable.

Karen Baker, Chief, CEG, CHG  
Geology, Permitting, and Corrective Action Branch

Enclosure

aky:010802

cc: PG&E Topock Consultative Workgroup Members – Via e-mail

PG&E Topock Technical Workgroup Members – Via e-mail

Native American Tribal Contacts for PG&E Topock project – Via e-mail



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## Department of Toxic Substances Control

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8800 Cal Center Drive  
Sacramento, California 95826-0806



Arnold  
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Governor

### MEMORANDUM

TO: Aaron Yue  
Senior Hazardous Substances Engineer  
Geology, Permitting and Corrective Action Branch  
Department of Toxic Substances Control (DTSC)  
5796 Corporate Avenue  
Cypress, CA 900630

FROM: J. Michael Eichelberger, Ph.D. *J. Michael Eichelberger*  
Staff Toxicologist  
Human and Ecological Risk Division (HERD)

DATE: December 20, 2007

SUBJECT: TOPOCK COMPRESSOR STATION – ECOLOGICAL EXPOSURE  
PARAMETERS, BIOACCUMULATION FACTORS, AND TOXICITY  
REFERENCE VALUES PG&E TOPOCK COMPRESSOR STATION,  
NEEDLES, CALIFORNIA.

PCA: 22120

Site Code: 540015-48

MPC: 44

### Background

The PG&E Topock facility entered service in 1951 as a compressor station for pipelines delivering natural gas from production fields in the southwestern United States to the PG&E service area in the Southern California. Facility operations include compression of natural gas, cooling of the natural gas and lubricating oil, wastewater treatment, and equipment and facility maintenance. From 1951 to 1985, hexavalent chromium (CRVI) was added to cooling water to control biological growth, limit scale and reduce corrosion. Initially (i.e., 1951-1964), untreated wastewater containing CRVI from the cooling towers (i.e., blowdown) was discharged directly to Bat Cave Wash. In 1964, the waste water was treated and CRVI was reduced to trivalent chromium (CRIII) prior to discharge. In 1969 unlined percolation beds were constructed in Bat Cave Wash to receive the treated wastewater. Wastewater discharge to Bat Cave Wash ceased in

1970 when PG&E began disposing of treated wastewater containing CRIII via injection wells to a depth of 450 below ground surface (bgs). PG&E discontinued the use of discharge to injection wells in 1973 and began discharging treated wastewater to four, single lined evaporation ponds located 1,600 feet west of the compressor station. In 1985, PG&E discontinued the use of CRVI-based water cooling additives and began using phosphate-based products in the cooling towers in its stead.

### **Document Reviewed**

HERD reviewed "Topock compressor Station – Ecological Exposure Parameters, Bioaccumulation Factors, and Toxicity Reference Values" hereafter referred to as the report. The Report was prepared by Arcadis BBL (Walnut Creek, CA), dated June 19, 2007 and received by HERD for review that same day via e-mail from Arcadis BBL.

### **Scope of the Review**

The report was reviewed for scientific content related to ecological risk assessment. Grammatical or typographical errors that do not affect the interpretation of the text have not been noted.

### **General Comments**

HERD notes that bioaccumulation factors and toxicity reference values offered in the report are for inorganic Chemicals of Potential Concern (COPECs) only. A complete list of Bioaccumulation Factors (BAFs) and Toxicity Reference Values (TRVs) including organic COPECs will need to be incorporated into the Ecological Risk Assessment Work Plan once DTSC and PG&E have agreed on the list of COPECs for the Topock Compressor Station.

### **Specific Comments**

1. Page 2/19, Exposure Parameters, bulleted list. The HERD agrees with the proposed avian and mammalian species representing the herbivorous, invertivorous and carnivorous feeding guilds. Although the first ecological technical memorandum titled "*Topock compressor Station – Revised Technical Memorandum on ecological conceptual Site Models, Assessment Endpoints, and Receptors of Concern – April 19, 2007*" listed plants and invertebrates under "assessment endpoints," HERD believes these guilds should also be listed as receptors of concern. When the work plan is submitted it should contain a list that should look like the following:

- a. Terrestrial Plants
- b. Terrestrial invertebrates
- c. Avian herbivore - Gambel's quail (*Callipepla gambelli*)
- d. Avian invertivore - cactus wren (*Campylorhynchus brunneicapillus*)
- e. Avian carnivore - red-tailed hawk (*Buteo jamaicensis*)
- f. Mammalian herbivore - Merriam's kangaroo rat (*Dipodomys merriami*)
- g. Mammalian invertivore - desert shrew (*Notiosorex crawfordi*)
- h. Mammalian carnivore - desert kit fox (*Vulpes macrotis*)

2. Page 6/19, Toxicity Reference values. HERD does not necessarily agree with the statement "*TRVs are conservative literature derived toxicity values and are biased toward protection of the individual, when ecological risk assessments are generally designed to protect species at the population level of ecological organization.*" HERD agrees that during an ecological risk assessment, comparison of average daily dose to a LOAEL based or mid range effect toxicity reference value HERD would agree that the U.S. EPA Region 9 Biological Technical Assistance Group (BTAG) recommended  $TRV_{\text{lovs}}$  for birds and mammals are protective of the individual. However, HERD does not believe the BTAG  $TRV_{\text{highs}}$  are protective of the individual, nor were they intended to be because they represent a dose that elicit an observable effect on the test organism. The  $TRV_{\text{lovs}}$  were designed to be very conservative and meant to serve as dose based (not media based, i.e., soil) screening numbers, meaning no further assessment was required if the calculated average daily dose was below the  $TYRV_{\text{low}}$ . The BTAG  $TRV_{\text{highs}}$  are dose based effect concentrations. The original intent of the BTAG  $TRV_{\text{highs}}$  was to serve as benchmarks that would trigger remedial measures. Any dose based concentrations that were found to be between the  $TRV_{\text{low}}$  and the  $TRV_{\text{high}}$  were considered to lie within an uncertainty range. However, there has been an increasing tendency by the environmental field to view any dose below the  $TRV_{\text{high}}$  as being protective when in reality this is not known.

HERD also believes the methodology used by the U.S. EPA in developing Ecological Soil Screening Levels  $TRV_{\text{lovs}}$  and  $TRV_{\text{higs}}$  precludes their ability to be considered protective of the individual. In many cases No Observed Adverse Effect Levels (NOAELs) from which the  $TRV_{\text{lovs}}$  are derived, are average values derived by calculation of a geometric mean of NOAELs estimated from data posted in the literature from multiple papers. Only growth, development, and survival, are considered as toxicity endpoints. Biochemical changes, alterations in behavior, effects on physiology and pathological effects to tissue are not considered. The studies that are selected and used to derive the individual NOAELs (and LOAELs) cross species lines often to the taxonomic level of order. Study duration varies, sometimes by as much as a factor of 10 times. Although the dosing is oral, the method of administration may vary from drinking water, food or by oral gavage.

HERD believes the uncertainty associated with the EPA method of developing TRVs underestimates toxicity to sensitive receptors and are not protective of the individual.

Generally, HERD believes that protection afforded to the individual, is protective of the population. HERD does not necessarily believe that a dose-based concentration less than the  $TRV_{high}$  is protective of a population. Protection of special status species should be afforded by comparison of dose based concentrations to the  $TRV_{low}$  (NOAEL) which HERD views as protective of the individual. Protection of special status species must be afforded to the individual since the loss of a single individual may deleteriously affect the population.

3. Table 1, Exposure Parameters for Representative Receptors, Pacific Gas and Electric Topock Compressor Station, Needles, California. Please replace the non-native short tailed-shrew (*Blarina brevicauda*) with the native desert shrew (*Mpopsprex crawfordi*) and adjust the body weight (0.005 kg, Silva and Downing 1995) and ingestion rate accordingly.
4. Table 3, Toxicity Reference Values, Pacific Gas and electric Topock compressor Station, Needles, California. HERD in general agrees with the TRVs proposed for the metals presented in the table as COPECs for the Topock Compressor site. HERD notes that the bulk of the TRVs are taken from the USEPA Eco SSLs (2005). BTAG TRVs have been used as a second tier literature source where TRVs for specific metals are not available from the USEPA ECO SSLs. In almost all cases (the two differences are noted in Table 1 below) where both USEPA Eco SSL and BTAG TRVs were available for the same metal (arsenic, cadmium, cobalt, copper, lead and nickel), the USEPA Eco SSL  $TRV_{low}$  is higher than the corresponding BTAG  $TRV_{low}$  and the USEPA Eco SSL  $TRV_{high}$  is lower than the comparable BTAG  $TRV_{high}$ .

Table 1. Comparison of TRVs derived from USEPA ECO SSL TRVs by BBL as compared to BTAG TRVs

Metal	EPA $TRV_{low}$	BTAG $TRV_{low}$	BBL <sup>3</sup> $TRV_{high}$	BTAG $TRV_{high}$	EPA $TRV_{low}$	BTAG $TRV_{low}$	BBL <sup>3</sup> $TRV_{high}$	BTAG $TRV_{high}$
BIRDS					MAMMALS			
Arsenic	2.24 <sup>1</sup>	5.5	3.55	22	1.04	0.32	1.66	4.7
Cadmium	1.47	0.08	6.35	10.4	0.77	0.06	7.7 <sup>2</sup>	2.64
Cobalt	7.61	NA	18.3	NA	7.33	1.2	18.8	20
Copper	4.05	2.3	12.1	52.3	5.6	2.67	9.34	632
Lead	1.63	0.014	3.26	8.75	4.7	1.0	8.9	241
Nickel	6.71	1.38	18.6	56.3	1.7	0.133	3.4	31.6

All concentrations are in  $mg/kg-day^{-1}$

NA = Not Available

1 - EPA TRV<sub>low</sub> is lower than corresponding BTAG TRV<sub>low</sub>

2 - EPA TRV<sub>high</sub> is higher than corresponding BTAG TRV<sub>high</sub>

3 - TRVs derived by BBL from Eco SSLs

Referring to Table 1, in most cases (except arsenic), the TRV<sub>low</sub>s proposed for the project are less protective than are the BTAG TRV<sub>low</sub>s. On the other hand, with the exception of cadmium, all of the TRV<sub>high</sub>s proposed for the project are more protective than are the BTAG TRV<sub>high</sub>s.

HERD would be most concerned about providing protection to the NOAEL (TRV<sub>low</sub>) level in the risk assessment if special status species were known to occur within the areas of concern (AOCs). Although the desert tortoise (*Gopherus agassizii*) is known to occur in the Topock Compressor Station area, desert tortoise studies were unable to confirm that the tortoise actually occurs within the boundaries of the AOCs under study for the RCRA Facility Investigation Ecological Risk Assessment.

Given that the TRV<sub>high</sub>s are more conservative than are the corresponding BTAG TRVs and that the desert tortoise is not expected to be found within the AOCs, HERD agrees with the TRVs selected for the project.

## Conclusions

The Ecological Risk assessment Workplan that will incorporate components of The desert shrew should be listed as the species representing the mammalian invertivorous feeding guild and the body weight should be reflected in the ingestion rate. The Ecological Risk Assessment Workplan should incorporate components of both the first technical memorandum "Topock compressor Station - Revised Technical Memorandum on Ecological Conceptual Site Models, Assessment Endpoints, and Receptors of Concern" as well as components of the second technical report that is the subject of HERD's comments in this memorandum. In addition the workplan will need to include BAFs and TRVs for organic COPECs. HERD agrees to the toxicity reference values for inorganic COPECs as presented in *Topock Compressor Station - Ecological Exposure Parameters, Bioaccumulations Factors and Toxicity Reference Values.*

Reviewed by: Gerald A. Pollock, Ph.D., D.A.B.T.  
Senior Toxicologist



James M. Polisini, Ph.D.  
Staff Toxicologist



Aaron Yue  
12/20/2007  
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Cc: Lynn H. Wellman  
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References:

Silva, M., and J.A. Downing. 1995. CRC Handbook of Mammalian Body Masses. CRC Press, Inc., Boca Raton.

USEPA Eco SSLs. 2005. <http://www.epa.gov/ecotox/ecossl/>