Department of Toxic Substances Control

The Mission of the Department of Toxic Substances Control is to provide the highest level of safety, and to protect public health and the environment from toxic harm.

State of California

California Environmental Protection Agency

FACT SHEET – March 2010
PG&E Topock Environmental Investigation Update

Cleanup Options Evaluation Report Is Complete

The California **Department of Toxic Substances Control (DTSC)**, as a **lead** State **agency**, is overseeing environmental investigations and cleanup activities at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station (Station) and adjacent land, collectively known as the Topock Site (Site) near Needles, California. DTSC has directed PG&E to investigate and evaluate options to clean up the **groundwater** and protect the Colorado River from groundwater contamination resulting from past operations at the Station. On December 18, 2009, DTSC approved PG&E's summary of the cleanup options evaluation report called a Final **Corrective Measures Study/ Feasibility Study (CMS/FS)** Report.

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Site Background and History

The PG&E Topock Gas Compressor Station is located in eastern San Bernardino County, about 12 miles southeast of Needles, south of Interstate 40, just west of the Colorado River. The area has cultural and spiritual significance to local Tribal Nations.

The Station, which began operation in 1951, compresses natural gas for transportation to PG&E's customers in Central and Northern California. As natural gas is compressed, its temperature increases and the compressed gas must be cooled. Historically, PG&E added a chromium-based substance to the water in the cooling towers to prevent corrosion of the equipment. Until 1964, untreated cooling tower wastewater containing **hexavalent chromium** was discharged into Bat Cave Wash, an adjacent normally dry wash which ends at the Colorado River.

Aerial photo of PG&E's Topock Compressor Station

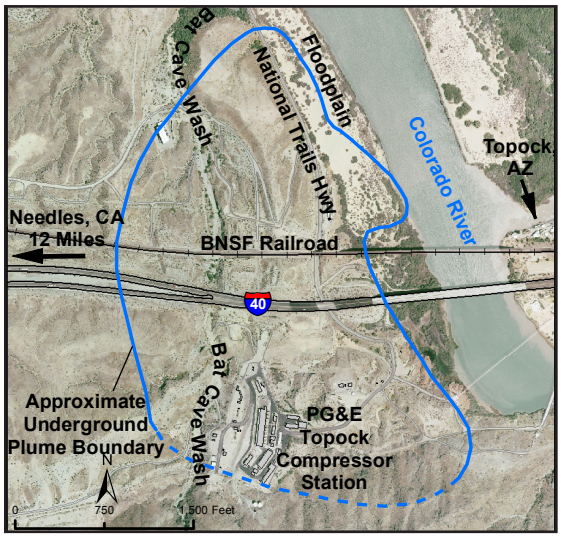
In the mid 1960's, PG&E began treating the cooling tower wastewater to convert hexavalent chromium to **trivalent chromium**, a less mobile form of chromium. By the mid 1970's, wastewater was discharged exclusively to single-lined ponds for storage until it evaporated. In 1985, PG&E stopped using chromium and switched to a more environmentally-safe additive to control corrosion. The old single-lined evaporation ponds were closed and replaced by new triple-lined ponds for disposal of chromium-free wastewater. These ponds are regulated by the California **Regional Water Quality Control Board (RWQCB)**.

In 1996, an environmental investigation was initiated to assess impacts from PG&E's operations. The investigation revealed contamination in soil and groundwater, and PG&E entered into a voluntary agreement with DTSC to investigate and clean up the contamination.

*Words in **Bold** appear in the glossary on the insert page.*

Environmental Investigation Process and the Cleanup Options Evaluation Report

Under DTSC's direction, PG&E is required to investigate and address all releases of hazardous waste and materials that may have occurred at the Site. This site investigation and cleanup process is called a **Corrective Action** under the **Resource Conservation and Recovery Act (RCRA)**. The **Remedial Facility Investigation/ Remedial Investigation (RFI/RI)** is a key step in the site cleanup process and describes, in a report, current environmental conditions at the Site. The RFI/RI report found that groundwater is affected by hexavalent chromium, and to a limited degree **molybdenum**, **selenium** and **nitrate**. The affected groundwater, referred to as the "**plume**", extends from the Station towards the Colorado River, but is not impacting the quality of the river water.



Map of Topock Project Site and Approximate Underground Plume Boundary

Based on the results summarized in the approved groundwater RFI/RI report, DTSC directed PG&E to prepare a Corrective Measures Study/Feasibility Study (CMS/FS) Report (Cleanup Options Evaluation Report). The CMS/FS Report identifies and evaluates a range of potential cleanup options and recommends a preferred cleanup option. Each cleanup option is evaluated against nine technical and regulatory (legal) criteria. The CMS/FS Report prepared by PG&E evaluates nine different cleanup options and provides DTSC with technical information to conduct an independent and objective review of the cleanup options identified.

Criteria Used to Evaluate Cleanup Options

Performance Standards

Any option selected by the agency as the final cleanup option must meet these performance standards. If the option does not meet these standards, the option will be rejected.

- **Protect Human Health and the Environment, Attain Media Cleanup Goals, Control Sources of Releases**
  The clean up must protect human health and the environment, meet the selected cleanup goals, and control or eliminate any sources of contamination.
- **Comply with Applicable Legal Requirements**
  The clean up action must meet all relevant state and federal legal requirements or provide a basis for being granted a legal waiver.

Modifying Criteria

Two additional criteria for consideration are public and state government concerns and preferences in selecting a remedy. These criteria are evaluated during the public comment period for the agency's proposed final cleanup action/plan.

- **State Acceptance**
  The extent to which an option is acceptable to the State.
- **Community Acceptance**
  The extent to which an option is supported and accepted by the community.

Balancing/Evaluation Criteria

Balancing/Evaluation criteria are used to compare options that can achieve the performance standards (to the left) against one another.

- **Long-term effectiveness, permanence, and reliability**
  The extent to which the cleanup action is effective and reliable at maintaining protection of human health and the environment over time, taking into account any risk to people or the environment after the cleanup is complete.
- **Reduction of toxicity, mobility, or volume through treatment**
  How effective the cleanup action will be at controlling or reducing the contaminant's level of potential harm (toxicity), its movement (mobility) and amount (volume) at the site.
- **Short-term effectiveness**
  The length of time needed to implement the cleanup action, and the risk the clean up poses to workers, residents, the community and the environment while it is being carried out.
- **Implementability**
  The anticipated technical and administrative feasibility of the cleanup option, including the availability of materials and services needed to carry it out.
- **Cost**
  The estimated construction, operation, and maintenance costs of the option for the anticipated life of the cleanup action.

Cleanup Options Evaluated

The nine different cleanup options evaluated in PG&E's Report include:

Alternative A: No Action
"No Action" is defined as no further treatment, operations, sampling or remediation. RCRA requires that this alternative be considered, and it serves as a baseline for comparison.

Alternative B: Monitored Natural Attenuation
Monitored Natural Attenuation takes advantage of naturally occurring conditions, such as helpful bacteria in the floodplain, which convert hexavalent chromium to trivalent chromium, a less mobile form of the metal. **Monitoring wells** would be installed to track this process, and non-engineered controls, such as groundwater use restrictions, would be put in place to protect human health and the environment. Molybdenum, selenium and nitrate will also be monitored under this and all the alternatives except Alternative A: No Action.

Alternative C: High Volume In-situ Treatment
In-situ treatment refers to treatment that occurs within the ground. For this alternative, **injection wells** would be used to inject water with added nutrients to promote the growth of harmless, but helpful, naturally occurring bacteria. The growth cycle of these helpful bacteria would then create chemical conditons that convert hexavalent chromium to trivalent chromium. After treatment is complete and nutrients removed, the bacteria level will return to pretreatment conditions. **Extraction wells** would be used to remove water out of the ground at key areas for re-injection. This injection and extraction process would evenly distribute the bacteria throughout the plume and reduce the size of the existing plume.

Alternative D: Sequential In-situ Treatment
This alternative uses alternating lines of extraction and injection wells. Extraction wells would first be used to extract groundwater from locations near the river, mix it with nutrient-added water to promote the growth of harmless but helpful, naturally occurring bacteria, then re-inject it through injection wells along National Trails Highway. The injection wells would then be converted to extraction wells and the re-injection process would be moved west toward the center of the plume. This process would continue across the upland area, treating the plume in sections in a phased approach. This option would also involve the installation of additional monitoring wells to ensure the plume is not increasing in size and that the treatment is working.

Alternative E: In-situ Treatment with Freshwater Flushing
Injection and extraction wells would be installed along National Trails Highway to create a "treatment zone" by continuously mixing the contaminated plume groundwater with nutrient-added water to stimulate harmless, but helpful, naturally occurring bacteria whose growth creates chemical conditions that convert haxavalent chromium to trivalent chromium. Extraction wells near the river would act as a barrier to prevent contamination from reaching the river, and would help convert hexavalent chromium in the floodplain. Additional injection wells located around the plume would inject fresh water and groundwater, removed from locations near the river, to push the plume toward the treatment zone.

Alternative F: Pump and Treat
Groundwater would be extracted from wells in the plume area and transported by pipelines to an above-ground treatment plant. This treatment method is called "pump and treat". Treated groundwater would be injected back into the ground outside of the plume boundaries. Hazardous materials removed from the groundwater would be collected as a solid material in the treatment plant and transported offsite to an appropriately-licensed disposal facility.

Alternative G: Combined Floodplain In-situ with Pump and Treat
This option is a combination of in-situ treatment and "pump and treat." The floodplain groundwater by the river will be treated as described in Alternative C, but the "pump and treat" method as described in Alternative F would be used to treat the rest of the area, where the main portion of the plume is located.

Alternative H: Combined Upland In-situ with Pump and Treat
This option is also a combination of in-situ treatment and "pump and treat" but the scenario would be reversed from that proposed under Alternative G. In-situ would be used to clean up the main portion of the plume, while the floodplain groundwater would be extracted and treated aboveground in a treatment plant.

Alternative I: Continued Operation of Interim Measures
This alternative would involve continued operation of the current **Interim Measure** treatment plant as the final cleanup action at the Site. The Interim Measure is a small scale version of Alternative F. The Interim Measure was established in 2004 to control groundwater flow to protect the Colorado River.

Cleanup Options Still Under Evaluation

The preferred cleanup option recommended by PG&E is Alternative E: In-situ Treatment with Fresh Water Flushing. However, DTSC and the **Department of the Interior (DOI)** are still evaluating the cleanup options, and have not yet selected a preferred option. DTSC's proposal for the final cleanup plan may be, or may not be, the same as the one recommended by PG&E.

Next Steps in Selecting a Groundwater Final Remedy

DTSC is preparing a Draft Programmatic **Environmental Impact Report (EIR)** which will analyze and summarize the expected environmental impacts of the cleanup options. The EIR also will identify actions (called mitigation measures) which may be taken to avoid or reduce environmental impacts.

DTSC will also prepare a **Statement of Basis** which will identify DTSC's proposed cleanup option and cleanup plan for the Site (the groundwater **Final Remedy**), and also explain the practical and legal reasons for the proposal. DOI will prepare an equivalent document called a **Proposed Plan**.

DTSC expects to release the Draft EIR and the Statement of Basis, together with DOI's Proposed Plan, for public review in late spring 2010. DTSC will issue a fact sheet and public notice which will announce the availability of the Draft EIR, the Statement of Basis that identifies the agency's proposed cleanup plan, and announce the beginning of a 60-day public comment period. The public comment period is designed to give the public and other government bodies (such as Tribal Nations) time to review the documents and to submit comments and input to DTSC and DOI. During the public comment period, DTSC will host an open house and public hearing at several locations in the Topock and Mohave Valley area to answer questions and take comments in person. The anticipated locations for these events include: Needles, Golden Shores/Topock, Lake Havasu City, and Parker.

Based on comments received, DTSC and DOI may determine that it is necessary to revise the proposed cleanup option or to choose a different one. DTSC will issue a final Statement of Basis and a **Notice of Determination (NOD)**. Similarly, DOI will issue a **Record of Decision (ROD)** that will identify and describe the final cleanup option selected. PG&E will be directed to implement the agencies' selected option.

January – April 2010
Finalize Draft EIR, Statement of Basis, Proposed Plan

May – June 2010
60-day Public Comment Period and Meetings

Late Summer 2010
Consider Public and Government Agency Comments

Fall 2010
DTSC Selects Final Remedy and Issues NOD

Winter 2010
DOI issues ROD
DTSC Directs PG&E to Prepare Workplan for Cleanup Action

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Inside: Update on PG&E Topock Compressor Station Environmental Investigation and Cleanup

DTSC Contacts

If you have questions, comments, or **would like to be added to the mailing list for the Topock Site**, contact the project staff listed below.

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Notice to Hearing-Impaired Individuals

You can obtain additional information about the site by using the California State Relay Service at 1.888.877.5378 (TDD). Ask them to contact Christina Fu at 714.484.5488.

Where Can I Find More Information?

Project reports, fact sheets, and other project documents can be found on the web at www.dtsc-topock.com, or in the Information Repositories listed below.

Needles Public Library
1111 Bailey Avenue
Needles, CA 92363
Contact: Kirsten Mouton
760.326.9255
Hours:
10am – 6pm, Monday and Tuesday
10am – 4pm, Wednesday
10am – 5pm, Thursday through Saturday

Chemehuevi Indian Reservation
2000 Chemehuevi Trail
Havasu Lake, CA 92363
Contact: Gilbert Parra
760.858.1140
Hours:
8am – 4pm, Monday – Friday

Golden Shores/Topock Library Station
13136 Golden Shores Parkway
Topock, AZ 86436
Contact: Kim Stoddard
928.768.2235
Hours:
8am – 2pm, Tuesday and Thursday
3pm – 6pm, Wednesday

Lake Havasu City Library
1770 North McCulloch Blvd.
Lake Havasu City, AZ 86403
Contact: Audrey LaCommare
928.453.0718
Hours:
9am – 6pm, Monday and Wednesday
9am – 8pm, Tuesday and Thursday
9am – 5pm, Friday and Saturday

Colorado River Indian Tribes Public Library
2nd Avenue and Mojave Road
Parker, AZ 85344
Contact: Elvira Bailey-Holgate
928.669.1285
Hours:
8am – noon, 1pm – 5pm
Monday – Friday

Parker Public Library
1001 Navajo Avenue
Parker, AZ 85344
Contact: Jeannie Smith
928.669.2622
Hours:
9am – 7pm, Monday – Friday
9:30am – 1pm, Saturday

DTSC
5796 Corporate Avenue
Cypress, CA 90630
Contact: Julie Johnson
714.484.5337
Hours:
9am – noon, 1pm – 4pm
Monday – Thursday

Glossary of Terms

Corrective Action: Specific activities designed to investigate and cleanup contamination at a site resulting from present and past hazardous waste handling practices.

Corrective Measure Study/Feasibility Study (CMS/FS): A study conducted by the facility owner/operator to identify and evaluate alternative cleanup options to address contamination at a project site.

Department of the Interior (DOI): The principal conservation agency of the United States, responsible for stewardship of land, water, recreation, Native American lands and needs, and energy needs. The department is composed of member bureaus such as the Bureaus of Indian Affairs, Land Management, and Reclamation, among others.

Department of Toxic Substances Control (DTSC): A department within the California Environmental Protection Agency in charge of the regulation of hazardous waste from generation to final disposal, and of overseeing the investigation and cleanup of hazardous waste sites.

Environmental Impact Report (EIR): A detailed review of a proposed project, its potential adverse impacts on the environment, measures that may avoid or reduce those impacts, and alternatives to the proposed project.

Extraction wells: Wells that are used primarily to remove groundwater from the ground. Water level measurements and water samples can also be collected from extraction wells.

Final Remedy: The final cleanup action proposed for managing contaminants at a project site.

Groundwater: Water beneath the Earth's surface that flows through soil and rock openings (aquifers).

Hexavalent chromium: A form of chromium, a metal naturally found in rocks, soil and the tissue of plants and animals, which is also used in industrial products and processes.

Injection wells: Wells used to add something to groundwater or to return water to the aquifer.

In-situ: In its original place; unmoved, unexcavated; remaining at the site or in the subsurface (underground).

Interim Measures: Cleanup actions taken to protect public health and the environment while long-term solutions are being developed.

Lead Agency: A public agency with the principal responsibility for ordering and overseeing site investigation and cleanup.

Molybdenum: A metallic element widely distributed in the Earth's crust that is used in industrial products and processes.

Monitoring wells: Specially-constructed wells used exclusively for testing water quality.

Nitrate: Nitrates and nitrites are nitrogen-oxygen chemical compounds which combine with various organic and inorganic compounds.

Notice of Determination (NOD): A formal document filed according to the California Environmental Quality Act (CEQA) and made available to the public once an agency approves a project. The notice provides the name and location of the project, a clear project description, the date of lead agency approval and a lead agency statement that the project will not have an adverse effect on the environment or that any adverse effects are either mitigated or outweighed by the benefits of the cleanup project.

Plume: A body of contaminated groundwater. The movement of a groundwater plume can be influenced by such factors as local groundwater flow patterns, the character of the aquifier in which the groundwater is contained, and the density of contaminants.

Proposed Plan:A document that summarizes the Remedial Investigation results and cleanup options evaluated in the Feasibility Study, and describes DOI's proposed cleanup methods and the rationale for their selection.

Record of Decision (ROD): A formal document that describes the selected remedies for a site.

Regional Water Quality Control Board (RWQCB): A California agency that maintains water quality standards for a specific geographic jurisdiction and enforces state water quality laws.

Resource Conservation and Recovery Act (RCRA): A federal law that establishes a regulatory system to track and provide safe procedures for management of hazardous wastes from the time of generation to final disposal.

RCRA Facility Investigation/Remedial Investigation (RFI/RI): An investigation that occurs in the corrective action process following a RCRA Facility Assessment. It is an in-depth study designed to gather data needed to determine the nature and extent of contamination at a site.

Selenium: A non-metallic element abundant in the Earth's crust that is used in industrial products and processes.

Statement of Basis: A document that describes the basis for DTSC's proposed remedy and cleanup standards.

Trivalent Chromium: A form of chromium, a metal naturally found in rocks, soil and the tissue of plants and animals. Trivalent chromium is considered an essential nutrient and is relatively harmless. It does not dissolve in groundwater and tends to bind to soil; thus it does not travel readily in the environment.