3R - 417

CORRESPONDENCE

2009

envirotech
Analytical Laboratory

CATION / ANION ANALYSIS

Client:	SMA	Project #:	03117-0014
Sample ID:	EPCO CPS 1989	Date Reported:	12-01-09
Laboratory Number:	52561	Date Sampled:	10-07-09
Chain of Custody:	8489	Date Received:	11-30-09
Sample Matrix:	Aqueous	Date Analyzed:	11-30-09
Preservative:	Cool		
Condition:	Out of Holding Time		

Parameter	Analytical Result	Units		
pH	3.32	s.u.		
Conductivity @ 25° C	20,900	umhos/cm		
Total Dissolved Solids @ 180C	11,400	mg/L		
Total Dissolved Solids (Calc)	11,480	mg/L		
SAR	46.6	ratio		
Total Alkalinity as CaCO3	<0.0	mg/L		
Total Hardness as CaCO3	948	mg/L		
Bicarbonate as CaCO3	<0.0	mg/L	0.00	meq/L
Carbonate as CaCO3	<0.1	mg/L	0.00	meq/L
Hydroxide as CaCO3	<0.1	mg/L	0.00	meq/L
Nitrate Nitrogen	1.10	mg/L	0.02	meq/L
Nitrite Nitrogen	0.001	mg/L	0.00	meq/L
Chloride	12.2	mg/L	0.34	meq/L
Fluoride	1.27	mg/L	0.07	meq/L
Phosphate	3.10	mg/L	0.10	meq/L
Sulfate	7,800	mg/L	162.40	meq/L
Iron	22.6	mg/L	0.81	meq/L
Calcium	300	mg/L	14.97	meq/L
Magnesium	48.3	mg/L	3.97	meq/L
Potassium	14.7	mg/L	0.38	meq/L
Sodium	3,300	mg/L	143.55	meq/L
Cations			162.87	meq/L
Anions			162.92	meq/L
Cation/Anion Difference			0.03%	

Reference: U.S.E.P.A., 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
Standard Methods For The Examination of Water And Waste Water", 18th ed., 1992.

Comments:

Analyst

Review

5796 US Highway 64, Farmington, NM 87401 | Ph (505) 632-0615 Fr (800) 362-1879 Fx (505) 632-1865 lab@envirotech-inc.com envirotech-inc.com

CHAIN OF CUSTODY RECORD

8489

Client: SMA	Project Name / Location: * EPCO CRS 1989
Client Address:	Sampler Name: Loren Diede
Client Phone No.:	Client No.: 03117-0014 ~~03117-0014~~ cw

ANALYSIS / PARAMETERS

Sample No./ Identification	Sample Date	Sample Time	Lab No.	Sample Matrix	No./Volume of Containers	Preservative $HgCl_2$	Preservative HCl	TPH (Method 8015)	BTEX (Method 8021)	VOC (Method 8260)	RCRA 8 Metals	Cation / Anion	RCI	TCLP with H/P	PAH	TPH (418.1)	CHLORIDE				Sample Cool	Sample Intact
* EPCOCRS1989	10-7-09	3:00pm	52561	Soil Solid ~~Sludge~~ Aqueous	j 500mL							X									✓	✓
				Soil Solid Sludge Aqueous																		
				Soil Solid Sludge Aqueous																Out of Holding Time		
				Soil Solid Sludge Aqueous																		
				Soil Solid Sludge Aqueous																		
				Soil Solid Sludge Aqueous																		
				Soil Solid Sludge Aqueous																		
				Soil Solid Sludge Aqueous																		
				Soil Solid Sludge Aqueous																		
				Soil Solid Sludge Aqueous																		

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
	11/30/09	13:30	Christine M Walters	11/30/09	13:30
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

loren.diede@souldermiller.com
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New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor
Joanna Prukop
Cabinet Secretary
Jim Noel
Deputy Cabinet Secretary

Mark Fesmire
Director
Oil Conservation Division

December 21, 2009

Mr. David R. Smith
Senior Environmental Scientist
EPCO, Inc., EHS&T
2727 North Loop West
Houston, Texas 77008-1044

Re: Approval of Groundwater Investigation Workplan
CPS-1989 Cathodic Protection Well (3RP-417)
Unit Letter A, Section 13, Township 28 North, Range 10 West, NMPM
San Juan County, New Mexico

Mr. Smith,

The Oil Conservation Division (OCD) approves the investigation workplan from Enterprise Products (EPCO) dated December 11, 2009 with respect to sulfur contaminated and acidic groundwater previously found to be emanating from an EPCO cathodic protection well at the location cited above. This preliminary investigative effort includes sampling of three (3) monitoring wells which are to be installed in the immediate area of the recently abandoned cathodic protection well. Each monitoring well is intended to access a distinct vertical interval of isolated groundwater.

OCD's approval is contingent upon the following additional conditions not otherwise addressed in the workplan:

- The OCD District 3 office in Aztec shall be notified at least 48 hours before any field activities are undertaken.

- The drilling contractor shall contain any low pH or high sulfate groundwater which may appear at the surface.

- The final length and positioning of the screened intervals in each of the three monitoring wells shall be determined based upon observations made during the drilling process including information gathered from any geophysical logging.

- If additional groundwater zones are identified during drilling or logging, EPCO shall isolate and monitor water quality in those zones.

- EPCO shall make field measurements of pH and conductivity of any water which may appear at surface during drilling, water collected during well development or purging, and upon splits of the water samples submitted for laboratory analysis.

The objective of this effort is to begin to determine the source and spatial extents of the impacted groundwater. OCD may require undertake additional investigation and corrective action based on the

results of this preliminary investigation. If groundwater with a pH of less than 6.0 or with a concentration of sulfates greater than 600 milligrams per liter is further identified during the investigation, the OCD will require EPCO to submit a workplan for initial remediation and further investigation within 30 days of discovery.

OCD's approval of this investigation workplan does not relieve EPCO of its responsibility to comply with all other applicable rules or regulations, including those of the Office of the State Engineer and the Bureau of Land Management. If you have any questions, please feel free to contact me at (505) 476-3465 or by email at *jim.griswold@state.nm.us*.

Sincerely,

Jim Griswold
Senior Hydrologist

JG/jg

cc: Brandon Powell, OCD District 3
Scott Hall, BLM Farmington Office
Cindy Gray, Souder Miller & Assoc.

Enterprise Products™

ENTERPRISE PRODUCTS PARTNERS LP
ENTERPRISE PRODUCTS OPERATING LLC
ENTERPRISE PRODUCTS GP, LLC, GENERAL PARTNER
ENTERPRISE PRODUCTS OLPGP, INC., SOLE MANAGER

December 11, 2009

Federal Express No.
8689 3269 5120

Mr. Jim Griswold
Environmental Bureau Chief
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RECEIVED OCD
2009 DEC 14 A 10:01

Re: Proposed Groundwater Investigation Work Plan
Enterprise Field Services, LLC
CPS-1989 Cathodic Protection Well
OCD Case #3R0417

Dear Mr. Griswold:

On November 24, 2009, the New Mexico Oil Conservation Division (OCD) requested that Enterprise Field Services, LLC (Enterprise) provide a work plan for investigation of groundwater conditions at the site referenced above. This correspondence provides our proposed work plan for this investigation.

Enterprise is currently evaluating the occurrence of low pH water at cathodic protection well CPS-1989. Damage to well head controls due to corrosion was discovered by Enterprise personnel on March 6, 2008. After it was determined that the source of the equipment corrosion was a discharge of low pH (~2.0) groundwater, the OCD was notified on March 13, 2008.

Subsequent to this discovery, Enterprise implemented controls to prevent site access and to collect the low pH water discharge prior to offsite disposal. Investigations were then conducted to determine the characteristics and source of the groundwater discharge. On June 6, 2008, Enterprise notified the OCD that an attempt would be made to pump water from the well to determine if the low pH was localized to the well bore, or indicative of another source. This attempt was not successful due to casing obstructions in the cathodic well vent tube. This was reported to the OCD in the *CPS-1989 Cathodic Protection Well Investigation Report,* dated September 30, 2008. Enterprise did not believe that the well was the source of the low pH water, and requested that the OCD approve plugging and abandonment of the well.

P. O. BOX 4324
HOUSTON, TX 77210-4324
713.381.6500

1100 LOUISIANA STREET
HOUSTON, TX 77002-5227
www.epplp.com

A Notice of Intention of Plug and Abandon CPS-1989 was filed with the OCD on July 22, 2009. The OCD approved this request, contingent Enterprise on performing an investigation to determine the source of the low pH groundwater discharge. Plugging and abandonment of the well was initiated on November 3, 2009, and on November 20, 2009, the OCD was notified that drilling efforts had ceased due to the increasing loss of borehole integrity and inability to remove the anode beds. The OCD provided their approval to cease drilling operations at this time, and to begin plugging operations. Only approximately half of the 500' deep well was successfully plugged.

A site meeting was held on December 2, 2009 with OCD, Bureau of Land Management (BLM) and Enterprise representatives to determine how to best proceed, and evaluate locations for site monitor wells. Enterprise believes the attached work plan will allow determining the hydrogeologic conditions at this site, and the source of the low pH groundwater occurrence. We are also evaluating recent information regarding the coke breeze utilized in this well to determine if it is the potential source.

We appreciate the OCD assistance on this project, and will implement the investigations proposed in this work plan as soon as possible following OCD approval. Please do not hesitate to contact me at (713) 381-2286, or drsmith@epco.com if you have any questions.

Sincerely,

David R. Smith, P.G.
Sr. Environmental Scientist

/bjm
Attachments

cc: Glenn Von Gonten, NMOCD Santa Fe, NM
Charlie Perrin, NMOCD/Aztec, NM
Brandon Powell, NMOCD/Aztec, NM
Cindy Gray, Souder Miller and Associates
Scott Hall, BLM
Sherry Landon, BLM

WORK PLAN
EPCO CPS 1989 CATHODIC WELL
GROUNDWATER MONITORING PROGRAM

Introduction

Souder, Miller & Associates (SMA) is pleased to submit this groundwater monitoring work plan on behalf of Enterprise Products LLC for a site adjacent to the EPCO CPS 1989 Cathodic Well located in the NE ¼ NE ¼ (Unit Letter A), Section 13, Township 28 North, Range 10 West, N.M.P.M.

The objective of this work plan is to investigate if the subsurface acidic water found in the CPS 1989 well is localized at the CPS 1989 well bore or if the acidic water has been or is currently migrating. The intervals of the water-bearing zones will be identified and the groundwater from each groundwater interval will be analyzed. This work plan has been prepared for Enterprise in accordance with the verbal request from EPCO to SMA on December 1, 2009.

Task: Geologic Research, Permitting, ROW Acquisition and Pre Job Preparation

The following are the general project management tasks to be completed prior to any field work at the site:

Geologic Research, Permitting and ROW: SMA will conduct research on the local and regional geology and hydrogeology to determine possible sources of the acidic water and aquifer characteristics. SMA will contact the NMOCD, Bureau of Land Management (BLM), and the New Mexico State Engineers Office to obtain the required permit applications and initiate the permitting process for the groundwater monitoring wells. EPCO will review the status of all right-of-ways and easements that will be impacted by the drill site.

Health and Safety Plan: A site specific health and safety plan will be developed in accordance with Enterprise requirements. Particular attention will be given to address in the potential hazards related to low pH fluids. All persons on site during field activities will be required to participate in daily safety briefings and sign the site health and safety plan. These persons may include personnel from SMA, EPCO, New Mexico Oil Conservation Division (NMOCD) and any subcontractors.

Utility Clearance: SMA will notify New Mexico One Call to identify any underground utilities associated with this well site. The utility locating service will be notified at least three (3) days before proceeding with any invasive field work. SMA will also work with EPCO to ensure clearance from underground structures.

Task: Monitoring Well Installation, Construction and Completion

SMA proposes installing one set (nest) of groundwater monitoring wells in the location indicated by NMOCD personnel during the site walk December 2, 2009 (see attached site map). The nest will consist of a group of three wells in close proximity to each other and within 50 to 100 feet of the plugged CPS 1989 well in a presumed down gradient area. The wells in the nest will be drilled to estimated depths of; 130 feet, 275 feet and 500 feet below ground level. Samples of the drill cuttings will be collected at ten foot intervals for lithologic description (ASTM D 2488-93, *Standard Practice for Description and Identification of Soils*). The wells will be drilled and completed according to the following specifications:

The 130 foot well will be constructed with a 10 3/4" conductor pipe to approximately 30 feet bgs. The conductor pipe will be installed and cemented to the surface using tremmie pipe and cement and will be allowed to set for at least 12 hours. Then an eight inch borehole will be drilled to 130 feet bgs. A 4" PCV production casing will be constructed with 20 feet of 0.010-inch slot size screen with a five foot sediment sump at the bottom. A silica sand (10-20 grade) filter pack will be placed from total depth to five feet above the top of the screened interval. A ten-foot bentonite pellet seal will be placed and hydrated above the filter pack. The annular space above the bentonite will be sealed with cement grout.

The 275 foot well will be constructed with a 13 3/8" steel conductor pipe to approximately 30 feet bgs. The conductor pipe will be installed and cemented to the surface using tremmie pipe and cement, allowed to set for at least 12 hours. Then a 10 3/4" borehole will be drilled through the cement to 150 feet bgs and an 8" PVC surface casing will be cemented to the surface and allowed to set for 12 hours.

A 7 7/8" borehole will be drilled to 275 feet bgs and the 4" PVC production casing will be constructed with 20 feet of 0.010-inch slot size screen with a five foot sediment sump at the bottom. A silica sand (10-20 grade) filter pack will be placed from total depth to five feet above the top of the screened interval, followed by a one-foot fine-grained silica sand filter pack seal. A five-foot bentonite pellet seal will be placed and hydrated above the filter pack. The annular space above the bentonite will be sealed with cement grout.

The 500 foot well will be constructed with a 13 3/8" steel conductor pipe to approximately 30 feet bgs. The conductor pipe will be installed and cemented to the surface. After the cement sets for at least 12 hours, a 10 3/4" borehole will be drilled to 290 ft bgs and an 8" PVC surface casing will be installed and cemented to the surface.

A 7 7/8" borehole will be drilled through the 8" casing to 500 feet bgs and the 4" PVC production casing will be constructed with 20 feet of 0.010-inch slot size screen with a five foot sediment sump at the bottom. A silica sand (10-20 grade) filter pack will be placed from total depth to five feet above the top of the well screen, followed by a one-foot fine-grained silica sand filter pack seal. A five-foot bentonite pellet seal will be placed and hydrated above the filter pack. The annular space above the bentonite will be sealed with bentonite followed by cement grout to surface.

After each well is completed, a 4'X4' reinforced concrete pad will be poured followed by a protective above-ground completion to be secured with a locking device.

Monitoring Well Development Procedures: Upon completion of all groundwater monitoring wells, the subcontracted drilling company will develop the wells using an airlift method until turbidity is minimized or until ten well volumes have been purged. All purged water generated during development activities will be stored in a frac tank for later disposal at a properly permitted facility.

Site and Well Surveying: All monitoring well locations will be surveyed to the nearest 0.1 feet with a total station or GPS survey equipment, referenced to a permanent control point or site benchmark with established UTM coordinates. Elevations of the top of the PVC well casing on the monitoring wells will be surveyed to the nearest 0.02 feet relative to the site benchmark using an auto level. All well coordinates (x, y, z) will be included in the Groundwater Investigation Report. Elevations will be referenced to the closest USGS benchmark or a National Geodetic Survey (NGS) monument so

that actual elevations relative to a sea level datum are provided. Depth to groundwater will be measured from the permanent mark.

Task: Data Analysis and Interpretation

Samples of water encountered in the drilling operation will be field tested on-site for pH. At completion of drilling, Open Hole Logs will be run to identify the water-bearing intervals within each well.

Task: Monitoring Well Installation Report

SMA will prepare a report for submittal to NMOCD, including a discussion of drilling and sampling activities, well construction details and field analytical results. The report will include the following site maps:

- Site location map referenced to USGS Quadrangle map
- Site map

The report will include the following tables:

- x, y, and z coordinates of monitoring well heads
- Elevations of ground water intervals
- Field analytical results for pH
- Results of ground water laboratory analyses

Appendices will include:

- Boring logs with drill cuttings-based lithologic descriptions
- Open hole electric logs
- Monitoring well completion diagrams
- Laboratory analytical reports

Task: Quarterly Groundwater Monitoring

SMA will collect samples for quarterly monitoring from each well in the nest.

Monitoring Well Sampling Procedures: The wells will be gauged for depth to groundwater prior to sampling. After purging a minimum of three well bore volumes using a Grundfos pump or similar equipment, decontaminated between the sampling of each well, SMA will collect groundwater samples using a clean bailer. .

All groundwater sample containers will be labeled with the date and time, sealed with evidence (custody) tape, and stored on ice for transport to the qualified laboratory. One groundwater sample will be collected from each well for laboratory analysis.

Waste Water Disposal Procedure: Water purged from monitoring wells for sampling will be contained in appropriately labeled 55-gallon drums and securely stored on site for future disposal. The water in the drums will be disposed at an appropriately permitted facility, with the waste water disposal manifest provided in the quarterly report.

Ground Water Analytical Methods: Groundwater samples will be analyzed for pH, Conductivity, Alkalinity, Hardness, Total Dissolved Solids (TDS), and Cat ion/Anion Analysis.

Task: Quarterly Groundwater Monitoring Reporting

Quarterly Monitoring Reports: A report will be prepared for each quarterly monitoring event to document monitoring activities.
The monitoring reports will include the following maps:

- Site location map referenced to USGS Quadrangle map
- Site map

The reports will include the following tables:

- Results of groundwater analyses
- Elevations of groundwater

Appendices of the report will include:

- Sampling protocols
- Laboratory reports
- Documentation and manifests for purge water disposal
- x, y, and z coordinates of monitoring well heads
- Results of groundwater analyses, if applicable
- Elevation of groundwater and surface water, if applicable

Proposed Schedule of Activities

Research, Permitting, and Pre Job Preparation: Initiated within 10 working days following NMOCD approval of this workplan and approval by Enterprise Products, LLC.

Drilling, Completion, and Well Development: Site prep and mobilization within 15 working days after NMOCD workplan approval and BLM approval of ROW.

Monitoring Well Installation Report: A report will be prepared to document the installation of the nest of monitoring wells and the findings of the initial investigation. Such report will be prepared within 45 days after completion of the installation to allow time for receipt of laboratory analytical results.

Quarterly Groundwater Monitoring: If appropriate based on the findings of the initial investigation during drilling, quarterly monitoring of the groundwater will be scheduled.

Attachment:

Site Map with proposed location of the three monitoring well nest


APPROXIMATE WELL
NEST LOCATION
CPS 1989
WELL LOCATION
© 2009 Europa Technologies
© 2009 Google
Pointer 13 S 246342.72 m E 4061771.38 m N elev 5695 ft
Streaming 100%
Eye alt 6868 ft