3R – 449

2010 GWM WORKPLAN

01 / 25 / 2010

Animas Environmental Services, LLC

624 E. Comanche . Farmington, NM 87401 . Tel 505-564-2281 . Fax 505-324-2022 . www.animasenvironmental.com

3R-449

RECEIVED

2010 JAN 27 PM 2 36

January 25, 2010

Mr. Glen von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Williams Four Corners, LLC, Sammons #2 Pipeline Groundwater Investigation Workplan

Dear Mr. von Gonten:

On behalf of Williams Four Corners, LLC, Animas Environmental Services, LLC (AES) is pleased to submit one copy of the Groundwater Investigation Workplan for the Sammons #2 pipeline spill located in Flora Vista, New Mexico.

A copy of the workplan has also been submitted to Mr. Brandon Powell of the New Mexico Oil Conservation Division in Aztec, New Mexico. The scope of work will be scheduled immediately upon your approval.

If you have any questions regarding AES' qualifications or the contents of the workplan, please do not hesitate to contact Ross Kennemer or Tami Ross at (505) 564-2281.

Sincerely,

Tami C. Ross

Tami C. Ross
Project Manager

Enclosure: Groundwater Investigation Workplan

Cc: Mr. Brandon Powell
New Mexico Oil Conservation Division
1000 Rio Brazos Road
Aztec, New Mexico 87410

Animas Environmental Services, LLC

624 E. Comanche . Farmington, NM 87401 . TEL 505-564-2281 . FAX 505-324-2022 . www.animasenvironmental.com

Prepared for:
Mr. Brandon Powell
New Mexico Oil Conservation Division
1000 Rio Brazos Road
Aztec, New Mexico 87410

Mr. Glen von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Groundwater Investigation Workplan

Sammons #2 Pipeline 2009 Spill

Williams Four Corners, LLC
SE¼ NE¼ of Sect. 32, T30N, R12W
Flora Vista, San Juan County, New Mexico

January 25, 2010

Prepared on behalf of:
Williams Four Corners, LLC
188 CR 4900
Bloomfield, NM 87413

Prepared by:
Animas Environmental Services, LLC
624 E. Comanche
Farmington, New Mexico 87401

Contents

Figures

Appendices

1.0 Introduction

Animas Environmental Services, LLC (AES), on behalf of Williams Four Corners, LLC, submits this workplan for groundwater investigation and report at the Sammons #2 Pipeline spill site. The pipeline release was discovered early December 3, 2009, and soil excavation was conducted in December 2009. Excavation activities and results of confirmation sampling were detailed in a report titled *Remedial Activities Report* dated January 11, 2010.

2.0 Site Information

2.1 Site Location

The general project area is located in a rural area approximately 0.1 mile east of County Road 3000 on private property owned by Ms. Helen Clark. The spill location is located approximately 140 feet southeast of a wetland area that is adjacent to the Animas River. The project area is described legally as being located within the SE¼ NE¼ Section 32, T30N, R12W in San Juan County, New Mexico. Longitude and latitude were recorded as being N36º46'18.240" and W108º06'54.540". A topographic site location map is included as Figure 1, and a Site Vicinity Map is presented as Figure 2.

2.2 Spill History

On December 3, 2009, trenching operations during routine pipeline replacement activities uncovered petroleum hydrocarbon contaminated soils. Williams was in the process of replacing an in-service 2-inch diameter natural gas pipeline with a new 4-inch diameter natural gas pipeline. The pipeline connects the Sammons 2 well locations, which are owned by Conoco Phillips. The volume of natural gas condensate released into the surrounding environment and the length of time that the 2-inch diameter pipeline was leaking are unknown.

The New Mexico Oil Conservation Division (NMOCD) was notified of the discovered release by Williams on December 3, 2009. Mr. Brandon Powell of NMOCD visited the site the afternoon of December 3, 2009. A verbal workplan was agreed upon by Williams and NMOCD to excavate the source area, since it was evident that groundwater had been impacted. Average depth to groundwater at the site is approximately 2 feet below ground surface (bgs).

Remedial activities were completed between December 7 and 17, 2009, and the scope of work included excavation of approximately 1,884 cubic yards of petroleum contaminated soil (PCS) and removal of 1,122 barrels (bbls) of petroleum contaminated groundwater.

3.0 Regional and Local Geology and Hydrogeology

3.1 Geology

San Juan County, New Mexico, is located in the San Juan Basin, which is a large, structural depression encompassing approximately 22,000 square miles and contains deep Tertiary fill resting on rocks of Late Cretaceous age. The lithology consists primarily of the Mesa Verde Formation, composed primarily of sandstones. The topography is broad and mostly flat, surrounded by mountains and deep canyons. Major rivers carved deep canyons and mesas, and physical erosion from wind and water chipped and polished the exposed rocks in the canyons.

The local site geology consists of Animas River alluvium, including clay to coarse sands, from the surface to approximately 3.5 feet bgs. River cobbles were encountered at approximately 3.5 feet bgs.

3.2 Hydrogeology

The Sammons #2 Pipeline is within the Animas River flood plain and located approximately 140 feet southeast of a wetland area adjacent to the Animas River. Based on measurements from the excavation area, groundwater underlying the spill site is approximately 2 feet bgs.

3.3 Sensitive Receptors

The project area is located in a rural area south of the Animas River, but the general area is still within the more densely populated areas of San Juan County (i.e. Farmington, Aztec, and Bloomfield). There are no known schools, day care centers, nursing homes or senior centers within the immediate vicinity.

4.0 Proposed Scope of Work

Site investigation activities will be initiated in order to delineate the full extent of petroleum hydrocarbon impacted groundwater and to further confirm the successful removal of impacted soils (lateral extent only). The investigation procedures are designed to be protective of both surface water and groundwater and are based upon protocols outlined in the United States Environmental Protection Agency (USEPA) documents, *Expedited Site Assessment Tools for Underground Storage Tank Sites* (March, 1997) and *Site Characterization for Subsurface Remediation* (November, 1991).

4.1 Access Agreements

Prior to initiating the field work, AES will obtain a written property access agreement from the property owner.

4.2 *Archaeological Clearances*

In the event that any evidence of human remains or burials is encountered, all work will be stopped immediately, and the State Historic Preservation Office (SHPO) will be contacted and appropriate mitigation measures will be implemented.

4.3 *U.S. Army Corps of Engineers and Office of State Engineer Permits*

Prior to initiating the site investigation, AES will consult with the U.S. Army Corps of Engineers (USACE) to obtain, if necessary, a Nationwide 404 permit. AES will also consult with New Mexico's State Engineer's Office for groundwater monitoring well permits that may be required for this project.

4.4 *Utilities Notification*

AES will utilize the New Mexico One-Call system to identify and mark all underground utilities at the site before the start of any proposed field activities which could impact buried utilities. Any local utilities not participating in the New Mexico One-Call system will be contacted separately by AES for utility locations.

4.5 *Health and Safety Plan*

AES has a Health and Safety Program in place to ensure the health and safety of all AES employees. The Health and Safety Program defines safety practices and procedures to be instituted in all AES work places, as applicable. The program meets the requirements promulgated by the Occupational Safety and Health Act (OSHA). All AES personnel are appropriately trained in accordance with OSHA 40 CFR 1910.120.

A comprehensive site-specific Health and Safety Plan (HASP) addressing the site investigation and associated sampling will be prepared prior to the start of the field work. An example of the plan that will be utilized for the project is included in Appendix A.

All employees and subcontractors will be required to read and sign the HASP to acknowledge their understanding of the information contained within it. The HASP will be implemented and enforced on site by the assigned Site Safety and Health Officer. Daily tailgate meetings will be held and documented during field activities and will address specific health and safety concerns or issues.

4.6 *Installation of Soil Borings*

AES proposes to install six soil borings which will be completed as groundwater monitoring wells within the spill area in order to define the extent of the groundwater petroleum hydrocarbon contamination. The December 2009 soil excavation confirmed the proposed lateral extent of petroleum hydrocarbon contaminated soil. The locations of the proposed soil borings/monitoring wells are shown on Figure 3.

4.6.1 Soil Borings

Soil borings will be advanced with a DT 6620 track-mounted direct push rig, manufactured by Geoprobe®, and equipped with a 2-inch outer diameter (OD) core barrel. Direct push drilling will be provided by Earth Worx, Los Lunas, New Mexico.

4.7 Soil Sampling and Analyses

4.7.1 Soil Sample Collection

All soil borings will be advanced to approximately 5 to 6 feet bgs, where it is anticipated that groundwater will be encountered at approximately 2.0 feet bgs. Each boring will be logged for lithology and sampled continuously for field screening of volatile organic compounds (VOCs) with a photo-ionization detector (PID) organic vapor meter (OVM). A minimum of one soil sample will be collected from each boring for laboratory analysis. The sample will be collected from the capillary fringe just above groundwater.

For each soil boring, a Soil Boring Log will be completed. These logs will record sample identification, depth collected, and method of collection, as well as observations of soil moisture, color, density, grain size, plasticity, contaminant presence, and overall stratigraphy. An example of the log which will be used is included in Appendix B.

Soil samples will be collected from continuously driven core-barrel samplers during advancement of the soil borings. Discrete samples will be collected based on PID-OVM screening measurements from the core barrel sampler and transferred to appropriately labeled sample containers. Soil sample collection will be completed in strict accordance with AES's Standard Operating Procedures (SOPs), which are available upon request.

4.7.2 Field Screening

Samples will be field screened for VOC vapors utilizing a PID-OVM calibrated with isobutylene gas to obtain preliminary data regarding potential petroleum hydrocarbon-impacted soil.

Once collected, the soil sample to be field screened will be immediately placed in a clean 16 ounce glass jar, filled approximately half full, and sealed with a threaded ring lid and a sheet of aluminum foil. The sample jar will then be placed in a warm water bath where it will be warmed to approximately 80°F. Approximately 10 minutes will be allowed for the soil to be heated and for any VOCs in the soil to accumulate in the head space of the jar. During the initial stages of headspace development, the sample will be gently shaken for one minute to promote vapor development and disaggregate the sample. Volatile gases will then be measured by piercing the aluminum foil with the sample probe of the PID-OVM. The highest (peak) measurement will be recorded. PID-OVM readings will be recorded onto the Soil Boring Logs. All field screening will be completed in strict accordance with AES SOPs.

AES does not anticipate any soil samples exceeding the above mentioned action level of 50 ppm, since the remedial excavation in December 2009, confirmed the removal of petroleum hydrocarbon contaminated soil (lateral extent only).

4.7.3 Laboratory Analyses - Soil

Analytical samples collected from soil borings will be submitted to an EPA-approved laboratory, Hall Environmental Analysis Laboratory, Albuquerque, New Mexico, or one of its subcontractors for analysis of the following parameters:

Table 1. Soil Analytical Parameters

Soil Boring	*Parameter*	*Analytical Method*	*Analyzing Laboratory*
All Soil Borings	BTEX (benzene, toluene, ethylbenzene, total xylenes)	EPA Method 8021	Hall Environmental Analysis Laboratory 4901 Hawkins NE, Suite D Albuquerque, NM (505) 345-3975
All Soil Borings	Total Petroleum Hydrocarbons (TPH) (C6-C36)	EPA Method 8015B Modified	Hall Environmental Analysis Laboratory 4901 Hawkins NE, Suite D Albuquerque, NM (505) 345-3975

Additional soil samples will be collected and submitted for laboratory analyses if warranted by field observation. Therefore, based on six proposed soil borings, a minimum of six soil samples will be submitted for laboratory analyses.

Once collected, sample containers will be packed with ice in insulated coolers and shipped via UPS or Greyhound Bus to the analyzing laboratory. Typical laboratory regular turn around time is 12 to 15 business days.

For all laboratory samples, quality assurance and quality control (QA/QC) procedures, sample preservation, apparatus required, and analyses performed will be in accordance with USEPA Document EPA-600, "Methods for Chemical Analysis for Water and Wastes" dated July 1982; and USEPA document SW-846, 3rd Edition, "Test Methods for Evaluating Solid Waste: Physical Chemical Methods", dated November, 1986.

4.8 Groundwater Monitor Well Installation

4.8.1 Groundwater Monitor Well Installation and Construction

Groundwater monitoring wells will be installed within all of the six soil borings. Monitoring well construction will consist of 1.4-inch outside diameter (OD) [0.75-inch inside diameter (ID)] Schedule 40 PVC screen and 1.0-inch blank riser casing. The screened interval will extend 5 feet across the water table. The wells will be constructed of a 1.4-inch OD (0.75-inch ID) pre-packed screen (0.010-inch slot). The screen is factory packed with 20/40

Colorado silica sand. A bentonite seal will be placed above the sand pack, and concrete grout with approximately five percent bentonite will be poured from the top of the bentonite plug up to within a 0.5 feet of ground surface. An above grade locking steel protective casing, enclosed with a shroud of concrete, will be installed on the well to prevent unauthorized access and damage from runoff and debris within the wash. A proposed monitoring well construction schematic is included on Figure 4. Monitoring wells will be installed in strict accordance with the AES SOPs and applicable ASTM standards.

4.8.2 Groundwater Monitor Well Development

Following monitor well installation and completion, each well will be developed by a combination of surging and bailing techniques. It is estimated that approximately one gallon of water will be generated during development of the 1-inch diameter shallow groundwater monitor wells. Groundwater purged from the wells will be contained in labeled and sealed 55-gallon drums. Development water will remain on-site in a secure location until proper disposal. Monitoring wells will be developed in strict accordance with AES SOPs and applicable ASTM standards.

4.8.3 Groundwater Monitor Well Monitoring and Sampling

Upon completion and development, the monitor wells will be allowed to sit undisturbed for a minimum of one week. The groundwater monitor wells will then be gauged to determine water table elevation and direction of groundwater flow. The wells will then be purged of a minimum of three well volumes, and a groundwater sample will be collected from each well.

Groundwater samples will be collected from each well with a new disposable bailer equipped with a low-flow release valve. Purging data, including pH, temperature, conductivity, oxidation-reduction potential, and dissolved oxygen, will be measured with a YSI water quality meter and documented on a Water Sample Collection Form along with purged water volume. All sampling equipment will be thoroughly decontaminated between uses. An example of the Water Sample Collection Form which will be used is included in Appendix B.

Duplicate groundwater samples will be collected from each monitoring well and held in the event that further laboratory analyses are required. All sample collection data, including sample collection depth, will be documented on a Water Sample Collection Form. A Chain of Custody Record will be completed in the field as samples are being collected. Samples will be stored in a chilled, insulated cooler at 6°C until delivered to the analyzing laboratory.

Groundwater monitoring, well installation, well development, and sampling will be completed in strict accordance with AES SOPs and applicable ASTM standards.

4.8.4 Professional Survey

The location and elevation of the top of each well casing will be surveyed to the nearest 0.01 foot with reference to mean sea level by a licensed surveyor in order to accurately determine the local groundwater depth and flow direction beneath the site. Each well will be tied to an existing USGS benchmark. AES will arrange with a New Mexico Licensed Professional Surveyor to complete the survey upon completion of the monitoring well installation.

4.8.5 Laboratory Analyses - Groundwater

All groundwater analytical samples collected from the monitoring wells will be submitted to an EPA-approved laboratory, Hall Environmental Analysis Laboratory, Albuquerque, New Mexico, or one of its subcontractors for analysis of the following parameters:

Table 2. Groundwater Analytical Parameters

Water Sample Location	***Parameter***	***Analytical Method***	***Analyzing Laboratory***
All Monitor Wells	BTEX	EPA Method 8021	Hall Environmental Analysis Laboratory 4901 Hawkins NE, Suite D Albuquerque, NM (505) 345-3975
All Monitor Wells	Total Petroleum Hydrocarbons (TPH) (C6-C36)	EPA Method 8015 Modified	Hall Environmental Analysis Laboratory 4901 Hawkins NE, Suite D Albuquerque, NM (505) 345-3975

A travel blank and field blank will be analyzed for BTEX per EPA Method 8260. Once collected, sample containers will be packed with ice in insulated coolers and shipped via UPS or Greyhound Bus to the laboratory. Typical laboratory regular turnaround time is 12 to 15 days.

For all laboratory samples, QA/QC procedures, sample preservation, apparatus required, and analyses performed will be per USEPA Document EPA-600, "Methods for Chemical Analysis for Water and Wastes" dated July 1982; and USEPA document SW-846, 3rd Edition, "Test Methods for Evaluating Solid Waste: Physical Chemical Methods", dated November 1986, as amended by Update One, July 1992.

4.9 Equipment Decontamination

In order to prevent cross-contamination between sampling locations, strict decontamination procedures will be employed during the investigation. All drilling equipment will be decontaminated after completing each soil boring, and sampling equipment (i.e. hand auger,

spoon sampler, and other hand tools) will be decontaminated following each use at an individual depth or location.

All decontamination of equipment will be completed within clean 5-gallon plastic buckets, which will contain the effluent. At least two tubs will be used, one designated for push rods and the other for small sampling equipment. On an as-needed basis, effluent from the tubs will be transferred by small pump or bucket into 55-gallon DOT approved drums, which will then be marked with identification labels and sealed. Decontamination procedures to be utilized are outlined below.

For small equipment such as hand augers, hand tools, and spoon samplers:

1. Physical removal of gross contamination and all debris with brushes
2. Hand wash with non-phosphate detergent
3. Hand wash with non-phosphate detergent and water using brush
4. Rinse with water
5. Second rinse with water
6. Air dry

All decontamination procedures will be completed in strict accordance with AES SOPs and applicable USEPA guidelines.

4.10 Investigation Derived Waste

4.10.1 Investigation Derived Waste – Equipment Decontamination Water

All decontamination and rinse water will be managed in accordance with applicable State and Federal regulations. Decontamination wash water will be stored on-site within 55-gallon DOT approved drums, which will then be marked with identification and sealed. Equipment decontamination water will then be disposed of at the Industrial Ecoystem Landfarm. Disposal manifests will be included within the investigation report.

4.10.2 Investigation Derived Waste - Groundwater

Contaminated water will be managed in accordance with applicable State and Federal regulations. Groundwater obtained from monitoring well development and pre-sample purging will be stored on-site within 55-gallon DOT approved drums, which will then be marked with identification and sealed. This water will then be disposed of at the Industrial Ecosystem Landfarm. Disposal manifests will be included within the investigation report.

4.11 Quality Assurance/Quality Control and Chain of Custody Procedures

4.11.1 Quality Control Samples

Field quality control samples will be collected in order to assess variability of the media being sampled and to detect contamination and sampling error in the field. Field QC samples will include field duplicates, trip blanks and if applicable, equipment rinsate blanks.

- One field duplicate sample will be collected for every ten field samples collected for laboratory analysis in order to check for reproducibility of laboratory and field procedures.

- One trip blank sample will be utilized per sampling event to check for contamination of volatile organic samples during handling and shipment from the field to the analyzing laboratory.

Laboratory QC samples will be analyzed by the laboratory and will consist of matrix spike and matrix spike duplicates for organic samples in order to identify, measure, and control the sources of error that may be introduced from the time of sample bottle preparation through analysis.

4.11.2 Sample Quality Assurance Elements

Sample quality assurance elements will include the following:

1. Sample documentation (location, date and time collected, batch, etc.)
2. Complete chain of custody records
3. Initial and periodic calibration of field equipment
4. Determination and documentation of applicable detection limits
5. Analyte(s) identification
6. Analyte(s) quantification

4.11.3 Chain of Custody Record

A Chain of Custody Record will be maintained from the time of sample collection until final deposition. Every transfer of custody will be noted and signed for, and a copy of the record will be kept by each individual who has signed it. The Chain of Custody Record will include the following information:

1. Sample identification
2. Sample location
3. Sample collection date
4. Sample information, i.e., matrix, number of bottles collected, etc.
5. Names and signatures of samplers
6. Signatures of all individuals who have had custody of the samples

When samples are not under direct control of the individual currently responsible for them, the samples will be stored in a locked container which has been sealed with a Custody Seal.

4.11.4 Custody Seal

Custody seals demonstrate that a sample container has not been opened or tampered with. The individual who has custody of the samples will sign and date the seal and affix it to the container in such a manner that it cannot be opened without breaking the seal.

5.0 Deliverables

Following completion of the groundwater investigation activities, a Groundwater Investigation Report, summarizing the investigation activities, will be submitted to the NMOCD and Williams Four Corners, LLC. The report will include the following:

1. A summary of all work conducted in the implementation of the investigation;
2. Maps of all sampling locations, including soil and groundwater contamination plumes;
3. Geologic cross-section
4. All laboratory data and quality assurance and quality control information; and
5. Recommendations of further sampling which needs to be conducted as a result of the sampling pursuant to the investigation.
6. Recommendations for further remediation measures

6.0 Implementation Schedule

AES proposes the following timeline to implement groundwater investigation activities, once NMOCD approval has been received. This schedule assumes that no inclement weather occurs, which could result in a delay in implementing field activities.

Task	***Days from NMOCD Workplan Concurrence***
1. Army Corps and OSE consultation. Schedule direct push rig for soil borings and monitor well installation; provide notification to NMOCD and Williams of scheduled site activities	8
2. Complete installation of soil borings and groundwater monitor wells; collect and submit soil and groundwater samples for laboratory analysis	5

3. Receive laboratory analytical reports for soil and groundwater samples	30
4. Prepare and submit Groundwater Investigation Report	45

7.0 Certification

AES has prepared this Groundwater Investigation workplan on behalf of Williams Four Corners, LLC to complete a continued environmental site assessment associated with the Sammons #2 Pipeline spill, which was discovered on December 3, 2009.

Respectfully submitted,

Ross Kennemer
Project Manager

Tami C. Ross
Project Manager

8.0 References

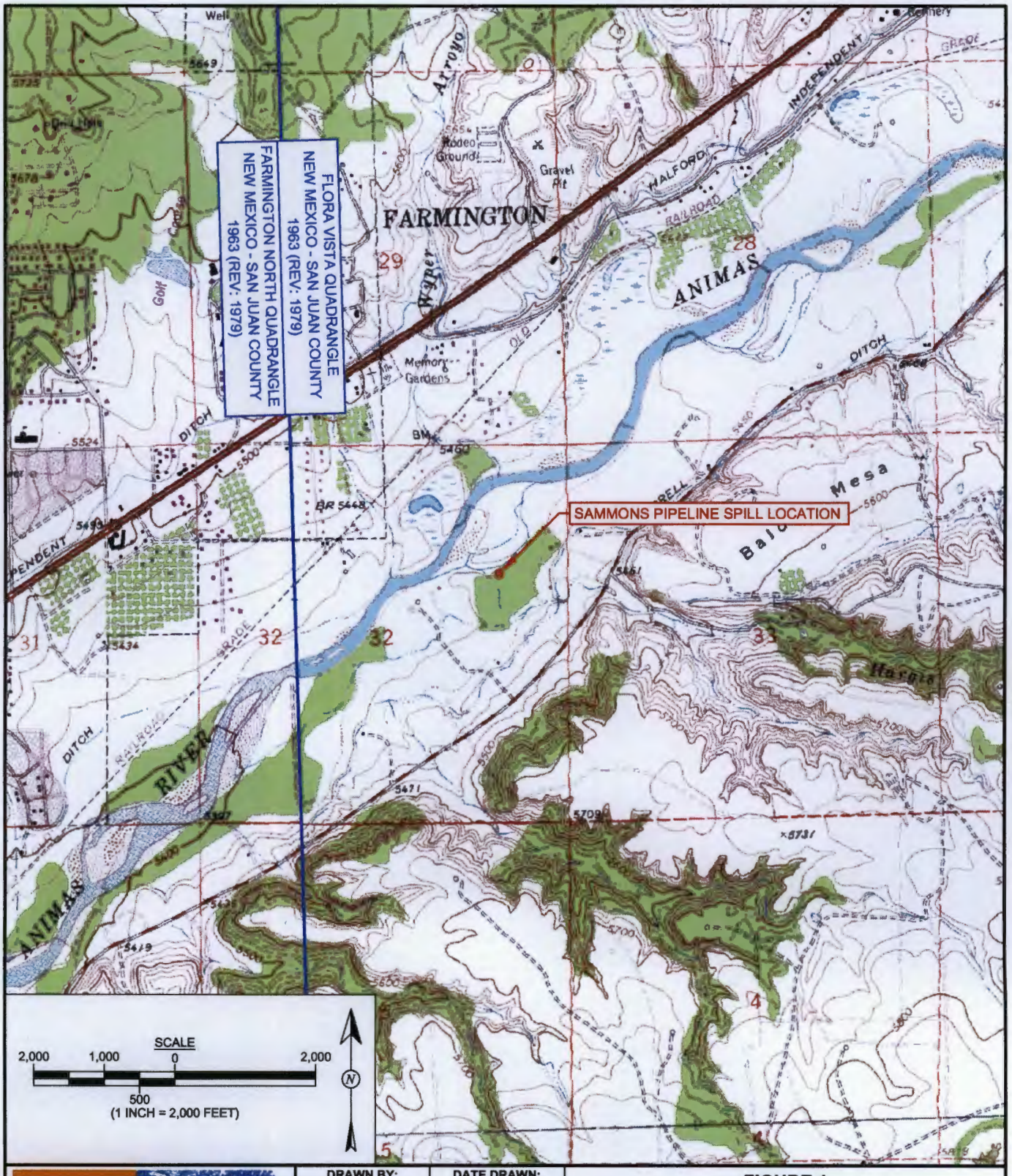
U.S. Environmental Protection Agency (USEPA). 1982. *Methods for Chemical Analysis for Water and Wastes.* Document EPA-600, July, 1982.

USEPA. 1992. SW-846, 3rd Edition, *Test Methods for Evaluating Solid Waste: Physical Chemical Methods*, dated November, 1986, and as amended by Update One, July, 1992.

USEPA. 1991. *Site Characterization for Subsurface Remediation*, EPA 625/4-91-026, November, 1991.

USEPA. 1997. *Expedited Site Assessment Tools for Underground Storage Tank Sites.* OSWER 5403G and EPA 510B-97-001, March, 1997.

USEPA. 2001. Contract Laboratory Program (CLP) Guidance for Field Samplers. OSWER 9240.0-35, EPA 540-R-00-003. June, 2001.

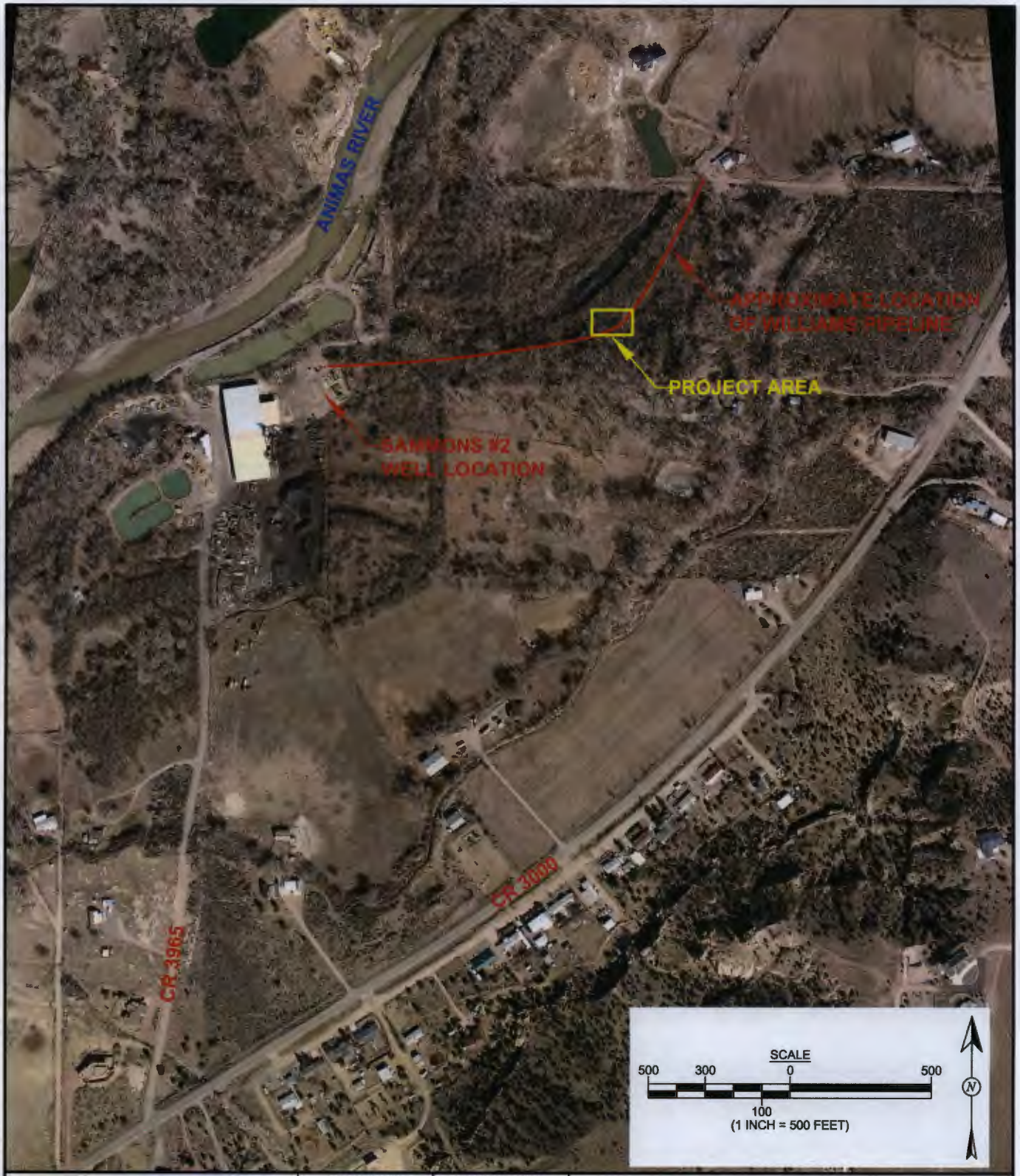


DRAWN BY: N. Willis	**DATE DRAWN:** December 22, 2009
REVISIONS BY: C. Lameman	**DATE REVISED:** January 5, 2010
CHECKED BY: R. Kennemer	**DATE CHECKED:** January 11, 2010
APPROVED BY: T. Ross	**DATE APPROVED:** January 11, 2010

Animas Environmental Services, LLC

FIGURE 1
TOPOGRAPHIC SITE LOCATION MAP
WILLIAMS FOUR CORNERS, LLC
SAMMONS #2 PIPELINE SPILL
COUNTY ROAD 3000
SE ¼ NE ¼, SEC. 32, T30N, R12W
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO
N 36° 46' 18.240", W 108° 06' 54.540"

S:\ANIMAS 2000\2010 PROJECTS\WILLIAMS PRODUCTION\SAMMONS #2 PIPELINE SPILL\MAPS AND DRAWINGS\FIGURE 1 TOPOGRAPHIC SITE LOCATION MAP

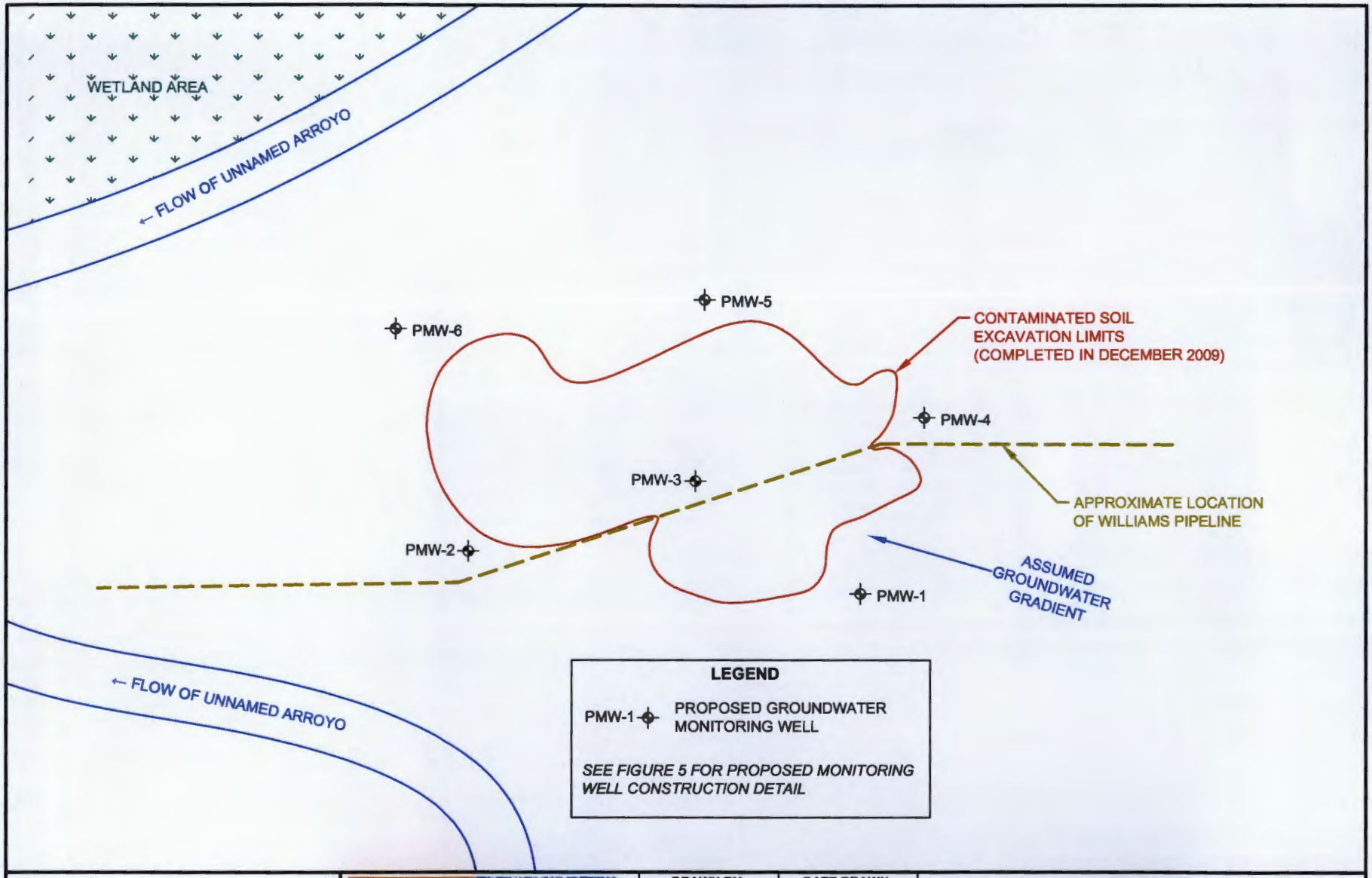


Animas Environmental Services, LLC

DRAWN BY: N. Willis	DATE DRAWN: December 22, 2009
REVISIONS BY: N. Willis	DATE REVISED: December 22, 2009
CHECKED BY: R. Kennemer	DATE CHECKED: January 11, 2010
APPROVED BY: T. Ross	DATE APPROVED: January 11, 2009

FIGURE 2
SITE VICINITY MAP
WILLIAMS FOUR CORNERS, LLC
SAMMONS #2 PIPELINE SPILL
COUNTY ROAD 3000
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO
N 36° 46' 18.240", W 108° 06' 54.540"

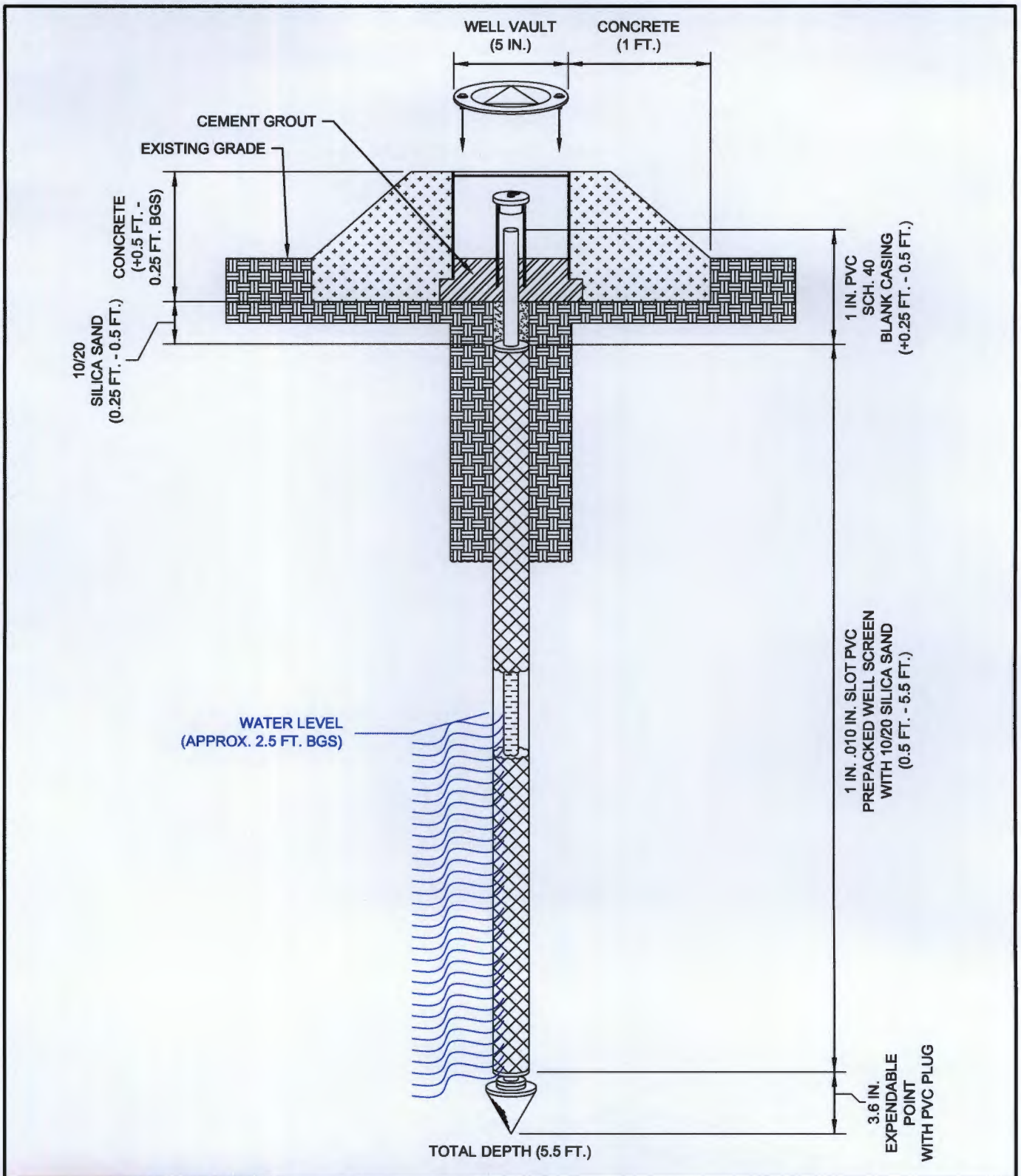
S:\ANIMAS 2000\2010 PROJECTS\WILLIAMS PRODUCTION\SAMMONS #2 PIPELINE SPILL\MAPS AND DRAWINGS\FIGURE 2 SITE VICINITY MAP



DRAWN BY: R. Kennemer	DATE DRAWN: January 14, 2010
REVISIONS BY: R. Kennemer	DATE REVISED: January 14, 2010
CHECKED BY: T. Ross	DATE CHECKED: January 14, 2010
APPROVED BY: T. Ross	DATE APPROVED: January 14, 2010

FIGURE 3
GENERAL SITE PLAN AND PROPOSED MONITORING WELL LOCATIONS
WILLIAMS FOUR CORNERS, LLC
SAMMONS #2 PIPELINE SPILL
COUNTY ROAD 3000
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO
N 36° 46' 18.240", W 108° 06' 54.540"

S:\ANIMAS 2000\2010 PROJECTS\WILLIAMS PRODUCTION\SAMMONS #2 GW REMEDIATION\MAPS AND DRAWINGS\FIGURE 3 GENERAL SITE PLAN AND PROPOSED MONITORING WELL LOCATIONS



Animas Environmental Services, LLC

DRAWN BY: N. Willis	**DATE DRAWN:** January 14, 2010
REVISIONS BY: N. Willis	**DATE REVISED:** January 14, 2010
CHECKED BY: R. Kennemer	**DATE CHECKED:** January 15, 2010
APPROVED BY: R. Kennemer	**DATE APPROVED:** January 15, 2010

FIGURE 4
PROPOSED MONITORING WELL CONSTRUCTION DETAIL
WILLIAMS FOUR CORNERS, LLC
SAMMONS #2 PIPELINE SPILL
COUNTY ROAD 3000
FARMINGTON, SAN JUAN COUNTY, NEW MEXICO
N 36° 46' 18.240", W 108° 06' 54.540"

:\ANIMAS 2000\2010 PROJECTS\WILLIAMS PRODUCTION\SAMMONS #2 GW REMEDIATION\MAPS AND DRAWINGS\FIGURE 4 PROPOSED MONITORING WELL CONSTRUCTION DETAIL

SITE HEALTH AND SAFETY PLAN

Site Name:

Date:

Prepared By:

Reviewed By:

Animas Environmental Services, LLC.
(505) 564-2281

Table of Contents

I. INTRODUCTION

This site specific Health and Safety Plan has been developed for use during the installation of... **(see Figure 1 – Site Plan and Work Areas)**. This plan has been prepared utilizing the *United States Environmental Protection Agency, Office of Solid Waste and Emergency Response Health and Safety Planner Version 3.0/4.0.* During development of this plan consideration was given to current safety standards as defined by EPA/OSHA/NIOSH, health effects and standards for known contaminants, and procedures designed to account for the potential for exposure to unknown substances. Specifically, the following reference sources have been consulted:

- OSHA 29 CFR 1910.120 and EPA 40 CFR 311
- U.S. EPA, OERR ERT Standard Operating Safety Guides
- NIOSH/OSHA/USCG/EPA Occ. Health and Safety Guidelines
- (ACGIH) Threshold Limit Values
- Environmental Remediation Drilling Safety Guideline (Revision 0 – 2005)

This section of the Site Health and Safety Plan (HASP) defines general applicability and general responsibilities with respect to compliance with the Health and Safety program that will be in effect during this project, which will include, but not limited to the following tasks:

- Installation of groundwater monitoring wells using a Direct Push Drill Rig (Track-Mounted)
- Collection of soil and groundwater samples that may be contaminated with petroleum hydrocarbons.

Purpose

The purpose of this Site Specific Health and Safety Plan is to define the requirements and designate protocols to be followed during completion of this project. Applicability and compliance with this plan extends to all government employees, contractors, subcontractors, and visitors.

Prior to entering the site, all personnel, government employees, contractors and subcontractors, shall be informed by the.... of the site conditions, emergency response procedures, and any potential fire, explosion, health, or safety hazards that might be present. This HASP summarizes those hazards in Table 3.1 and 3.2.

This plan must be reviewed and an agreement to comply with the requirements must be signed by all personnel prior to entering the work area.

Visitors

All visitors, government employees, contractors and subcontractors entering the work area, which for the purposes of the plan is defined as **within 20 feet in any direction from the drilling rig or well installation as identified on Figure 1 – Site Plan and Work Areas**, will be required to fully comply with and demonstrate with appropriate documentation, without exception, the following:

- **Site Health and Safety Officer (Site Supervisor)** – OSHA 40 hour HAZWOPER Course; current 8 hour HAZWOPER Refresher; current 8 hour Supervisor Training; and valid certificate for completion of First Aid Basics and Adult CPR.

- **Contractors, Subcontractors, and Consultants** – OSHA 40 hour HAZWOPER Course and current 8 hour HAZWOPER Refresher.

- **Visitors (All Visitors and Government Employees)** – OSHA 24 hour HAZWOPER Occasional Site Worker Course and current 8 hour HAZWOPER Refresher.

- **All Contractors, Subcontractors, Consultants, Visitors and Government Employees** - Provide own personal protective equipment to include hard hat, safety glasses, steel-toed boots.

- **All Contractors, Subcontractors, Consultants, Visitors and Government Employees** - Read and verify, by signature, compliance with the provisions of this HASP

In the event that a contractor, subcontractor, consultant, visitor or government employee does not adhere to the provisions of the HASP, that individual will be requested to leave the Exclusion Area.

II. KEY PERSONNEL/IDENTIFICATION OF HEALTH AND SAFETY

Key Personnel

The following personnel and organizations are critical to the planned activities at the site. The organizational structure will be reviewed and updated periodically by the site supervisor.

Site Specific Health and Safety Personnel

The Site Health and Safety Officer (HSO) will maintain total responsibility for ensuring that the provisions of this HASP are adequate and implemented in the field. Changing field conditions may require decisions to be made concerning adequate protection programs. Therefore, it is vital that personnel assigned as HSO be experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120 (see Section 4.2 of this HASP). The HSO is also responsible for conducting site inspections on a regular basis in order to ensure the effectiveness of this plan.

The HSO at the site is:

Designated alternates include:

Organizational Responsibility

Animas Environmental Services, LLC (AES) is responsible for providing technical, regulatory, and safety assistance for all site activities.

III. TASK/OPERATION SAFETY AND HEALTH RISK ANALYSIS

Site Overview

The following section defines the known or potential hazards and the methods to protect personnel from those hazards as identified in previous site work.

Task by Task Risk Analysis

The following sections summarize an evaluation of hazards based upon the knowledge of site history as presented in Section 3.1, and anticipated risks posed by the specific operation. This list in by no means all inclusive and other unforeseen hazards may exist.

General Chemical Hazards for all Project Tasks

SUBSTANCES INVOLVED	CONTAMINANT CONCENTRATION	INHALATION RISK	INGESTION RISK	ABSORPTION RISK

Legend:

Slt.	Slight
Mod	Moderate
High	High
IDLH	Immediately Dangerous to Life and Health
NA	Not Applicable

CONSULT ATTACHED MATERIAL SAFETY DATA SHEETS (MSDS) FOR ADDITIONAL CHEMICAL INFORMATION

Potential Health and Safety Hazards for all Project Tasks

PHYSICAL HAZARDS	TASK: SITE WALK THROUGH	TASK: DRILLING, SOIL SAMPLING, and WELL INSTALLATION	TASK HAZARD PROTECTION METHODS
Chemical Inhalation Hazard	Slt.	Mod.	Wear Respirator With Organic vapor Cartridges, if needed
Chemical Ingestion Hazard	Slt	Slt.	NA
Chemical Absorption Hazard	Slt.	Mod.	Wear Chemical Resistant Gloves While Handling Samples
Heavy Equipment and Moving Parts	Slt.	High	Wear hardhat, steel toed boots, gloves and safety glasses. Nonessential personnel Stay Away From Drilling Rig
Noise	Slt.	Slt.	Use Ear Protection
Equipment Exhaust Vapors	Slt.	Slt.	Stay Away From Drilling Rig exhaust pipe
Traffic	High	High	Wear Safety Vest and be Aware of Traffic
Heat/Cold Stress	Slt.	Slt.	Wear Appropriate Field Clothing
Wildlife – bites and stings	Slt.	Slt.	Avoid Wildlife
Head Injury	Slt.	High	Wear Hard Hat
Eye Injury	Slt.	High	Wear Safety Glasses With Side Shields
Hand Injury	Slt.	High	Wear Appropriate Gloves and Watch Where You put Your Hands
Foot Injury	Slt.	High	Wear Steel Toed Boots

Legend:

Slt. Slight
Mod Moderate
High High
IDLH Immediately Dangerous to Life and Health
NA Not Applicable

Specific guidelines for Drill Rig Safety are found in Appendix A.

PERSONAL PROTECTIVE EQUIPMENT TO BE USED

Field work to be completed during the Well Installations will require **Level D Protection**.

Level D Personnel Protective Equipment

- Coveralls (if needed)
- Gloves
- Boots/shoes, leather or chemical-resistant, steel toe and shank
- Safety glasses
- Hard hat
- Hearing Protection

Reassessment of Protection Program

The Level of Protection provided by PPE selection shall be upgraded or downgraded based upon a change in site conditions.

When a significant change occurs, the hazards should be reassessed. Some indicators of the need for reassessment are:

- Commencement of a new work phase.
- Change in job tasks during a work phase.
- Change of season/weather.
- When temperature extremes or individual medical considerations limit the effectiveness of PPE.
- Contaminants other than those previously identified are encountered.
- Change in ambient levels of contaminants.
- Change in work scope, which affects the degree of contact with contaminants.

Specific Contaminants To Be Monitored At The Site

The following provides a summary of the contaminants to be monitored for and frequency/ schedule of monitoring. The air sampling checklist will serve as a site monitoring plan.

Volatile Organics (Hydrocarbons):

Air Monitoring Instruments:

- PID-OVM
- Frequency : Regularly, during well installation
- Locations : Within 5 feet of the bore hole

Action Levels:

- Organic gases and vapors:
- Action Level: 50 ppm ambient
- Action: Stop drilling and reassess PPE.

Reporting Format:

- Field data sheets

IV. DAILY TAILGATE SAFETY MEETINGS

At a minimum, prior to beginning work each day, a daily tailgate safety meeting will be held. All contractors, subcontractors, consultants, visitors, and government employees are expected to attend and actively participate in these safety meetings. The following items are examples that might be discussed by the site supervisor or other personnel:

- Air Monitoring
- Chemical hazards
- Emergency response plan
- Engineering controls and work practices
- Heavy machinery
- Overhead and underground utilities
- Personnel protective equipment
- Physical hazards
- Respiratory protection
- Site Control
- Site characterization and analysis
- Symptoms of overexposure to hazards
- Tool Safety
- Training requirements

V. SITE CONTROL MEASURES

The following section defines measures and procedures for maintaining site control. Site control is an essential component in the implementation of the site health and safety program.

Buddy System

During all Level D activities or when some conditions present a risk to personnel, the implementation of a buddy system is mandatory. A buddy system requires at least two people who work as a team; each looking out for each other.

Site Communications Plan

Successful communications between field teams and contact with personnel in the support zone is essential. The following communications systems will be available during activities at the Site.

Hand Signals

Signal	Definition
Hands clutching throat	Out of air/cannot breath
Hands on top of head	Need assistance

Thumbs up	OK/I am all right/I understand
Thumbs down	No/negative
Arms waving upright	Send backup support
Grip partner's wrist	Exit area immediately

Exclusion Zone Definition

The two general work zones established at the Site are the Exclusion Zone and the Support Zone. Figure 1 provides a site map with the work zones designated on it.

The Exclusion Zone is defined as the area where contamination is either known or likely to be present, or because of activity, will provide a potential to cause harm to personnel. Entry into the Exclusion Zone requires the use of, at minimum, Level D personnel protective equipment.

The Support Zone is situated in areas where the chance to encounter hazardous materials or conditions is minimal. Personal protective equipment is therefore not required.

Standing Orders For Exclusion Zone

- No smoking, eating, or drinking in this zone.
- No horse play.
- No matches or lighters in this zone.
- Check-in on entrance to this zone.
- Check-out on exit from this zone.
- Implement the communications system.
- Line of sight must be in position.

Wear the appropriate level of protection as defined in the Safety Plan. Level D is anticipated for all site activities

Emergency Alarm Procedures

Evacuation Routes and Procedures will be deployed in the event of an emergency. Communication signals will also be used according to this section.

Personnel Requirements

Task	Control Measures	Comments
Site Walk Through	Line of Sight	
Drilling, Soil Sampling, and Well Installation	Line of Sight	

Nearest Medical Assistance

The route to the nearest hospital should be verified by the HSO, and should be familiar to all site personnel. The following individuals on site have current certification in CPR and/or first aid:

- Ross Kennemer, AES Project Manager/Health and Safety Officer
  Cellular Phone: (505) 486-1776

Nearest medical assistance is located at:

- San Juan Regional Medical Center –

VI. EMERGENCY RESPONSE/CONTINGENCY PLAN

This section describes contingencies and emergency planning procedures to be implemented at the Site. This plan is compatible with local, state and federal disaster and emergency management plans as appropriate.

Pre-Emergency Planning

During the daily tailgate safety meetings, all personnel present will be trained in and reminded of provisions of the emergency response plan, communication systems, and evacuation routes. This will ensure that the plan is adequate and consistent with prevailing site conditions.

Evacuation Routes/Procedures

In the event of an emergency, which necessitates an evacuation of the site, the following alarm procedures will be implemented:

- Evacuation alarm notification should be made using three short blasts on the air horn or car horn.
- All personnel should evacuate to a predetermined location upwind of any activities. The location will be determined each day prior to beginning activities.
- Insure that a predetermined location is identified off-site in case of an emergency, so that all personnel can be accounted for.

EMERGENCY CONTROL MEASURES

HAZARD	PREVENTION/CONTROL	LOCATION
Fire/Explosion	Fire Extinguisher	On-site Project Manager Vehicle & Drill Rig Support Vehicle

Emergency Contact/Notification System

The following list provides names and telephone numbers for emergency contact personnel. In the event of a medical emergency, personnel will take direction from the

HSO and notify the appropriate emergency organization. In the event of a fire or spill, the site supervisor will notify the appropriate local, state, and federal agencies.

Organization	Telephone
Ambulance	911
Police	911
Fire	911
State Police	911
San Juan Regional Med. Center	1-505-325-5011
Poison Control Center	1-800-432-6866
National Response Center	800-424-8802
Center for Disease Control	404-488-4100
Chemtrec	800-424-9555

Emergency Medical Treatment Procedures

First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the Health and Safety Officer. Any person being transported to a clinic or hospital for treatment should take with them information on the chemical(s) they have been exposed to at the site. This information is included in the MSDS Sheets

Fire or Explosion

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the project manager or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on site. If it is safe to do so, site personnel may:

- Use fire fighting equipment available on site to control or extinguish the fire; and,
- Remove or isolate flammable or other hazardous materials, which may contribute to the fire.

Spill or Leaks

In the event of a spill or a leak, site personnel will:

- Inform the on-site Project Manager immediately;
- Locate the source of the spillage and stop the flow if it can be done safely; and,
- Begin containment and recovery of the spilled materials

Emergency Equipment/Facilities

The following emergency equipment is located in the on-site Project Manager's vehicle:

- First aid kit
- Fire extinguisher

- Mobile telephone
- Spill kits
- Eye wash

VII. HAZARD COMMUNICATION

Material Safety Data Sheets (MSDSs)

Copies of MSDSs for all chemicals of concern known or suspected on site are provided in Appendix A. All employees at the start of each work shift should review MSDSs.

Employee Training and Information

Prior to starting work, each employee will attend a health and safety orientation and will receive information and training on the following:

- An overview of the requirements contained in the Hazard Communication Standard, 29 CFR 1910.1200;
- Chemicals present or potentially present at the site;
- Location and availability of a written hazard program;
- Physical and health effects of the hazardous chemicals;
- Methods and observation techniques used to determine the presence or release of hazardous chemicals;
- How to lessen or prevent exposure to these hazardous chemicals through usage of control/work practices and personal protective equipment;
- Emergency procedures to follow if they are exposed to these chemicals;
- How to read labels and review MSDSs to obtain appropriate hazard information;
- Location of MSDS file and location of hazardous chemical list.
- Drill rig safety
- Buried and overhead utility safety

Soil Boring Log
Soil Boring No:
Monitor Well No:

Animas Environmental Services
624 E Comanche Farmington, NM 87401
Tel. (505) 564-2281 Fax (505) 324-2022

Project: ____________________ **Project No.:** ____________________
Client: ____________________ **Date:** ____________________
Location: ____________________ **Elevation:** ____________________
Driller: ____________________ **Datum:** ____________________
Drilling Method: ____________________ **Logged by:** ____________________
Depth to Water (ft): **Well Diameter (in.):** ____________________

Depth (ft)	Soil Description	OVM (ppm)	Monitor Well Details

MONITORING WELL SAMPLING RECORD	Animas Environmental Services
Monitor Well No: MW-1	624 E. Comanche, Farmington NM 87401 Tel. (505) 564-2281 Fax (505) 324-2022

Site: _____ Project No.: _____
Location: _____ Date: _____
Project: _____ Arrival Time: _____
Sampling Technician: _____ Air Temp: _____
Purge / No Purge: _____ T.O.C. Elev. (ft): _____
Well Diameter (in): _____ Total Well Depth (ft): _____
Initial D.T.W. (ft): _____ Time: _____ *(taken at initial gauging of all wells)*
Confirm D.T.W. (ft): _____ Time: _____ *(taken prior to purging well)*
Final D.T.W. (ft): _____ Time: _____ *(taken after sample collection)*
If NAPL Present: D.T.P.:_____ D.T.W.:_____ Thickness:_____ Time:_____

Water Quality Parameters - Recorded During Well Purging

Time	Temp (deg C)	Conductivity (µS) (mS)	DO (mg/L)	pH	ORP (mV)	PURGED VOLUME (see reverse for calc.)	Notes/Observations

Analytical Parameters (include analysis method and number and type of sample containers)

Disposal of Purged Water: _____
Collected Samples Stored on Ice in Cooler: _____
Chain of Custody Record Complete: _____
Analytical Laboratory: Hall Environmental Analysis Laboratory, Albuquerque, NM
Equipment Used During Sampling: Keck Water Level or Keck Interface Level, YSI Water Quality Meter and New Disposable Bailer

Notes/Comments:

Revised: 08/10/09

If it is necessary to calculate the volume of the monitoring well to determine what volume of groundwater will need to be purged from the well prior to collecting the samples, use the following equation:

Well Volume = (h)(cf)

where:

h = height of water column (feet)
cf = gallons/foot based on well diameter shown below

The gallons/foot for common size monitoring wells are as follows:

Well Diameter (inches)	2"	3"	4"	6"
Volume (gallons/foot)	0.1632	0.3672	0.6528	1.4688

The well volume is typically tripled to determine the volume to be purged.

Show purge volume calculation below:

h = Total Well Depth - Depth To Water = _____ - _____ =

Well Volume = (h)(cf) = ( )(0.1632) =

Total Purge Volume = 3(Well Volume) = _____