

Ground Water Remediation System Operations, Monitoring, and Maintenance Procedures Shiprock, New Mexico

June 2003

UMTRA Ground Water Project

**Ground Water Remediation System
Operations, Monitoring, and Maintenance Procedures**

Shiprock, New Mexico

June 2003

Prepared by
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Plate

Plate 1—Shiprock, New Mexico, UMTRA Project Site Ground Water Remediation System

1.0 Introduction

The U.S. Department of Energy (DOE) manages the Uranium Mill Tailings Remedial Action (UMTRA) Grand Water Project remediation system to treat the ground water at the Shiprock, New Mexico, site. The S.M. Stoller Corporation (Stoller) is the Technical Assistance Contractor (hereinafter referred to as the Contractor) for the DOE Grand Junction Office (DOE-GJO). The site is in the Navajo Nation in the northwest corner of New Mexico about 1 mile south of the junction of U.S. Highways 64 and 666, which defines the center of the town of Shiprock.

Ground water at the site has been contaminated as a result of uranium-vanadium milling activities from 1954 to 1968. The site is bordered on the north by the San Juan River and includes a floodplain area and a terrace area. An escarpment approximately 50 to 60 feet high separates the river floodplain from the elevated terrace to the south. Milling-related contaminants in ground water on the floodplain and terrace include ammonium, manganese, nitrate, selenium, strontium, sulfate, and uranium. Ground water cleanup strategies for the site are, for the floodplain—natural flushing supplemented by extraction of ground water from the contaminant plume where it is nearest the San Juan River, and for the terrace—active removal of ground water from a paleochannel and collection of ground water near where it is exposed as surface water in Many Devils and Bob Lee Washes. The objective of removing ground water in the paleochannel is to lower the water surface to such a level that ground water will no longer move toward the washes and seeps, thereby eliminating surface exposure. The infrastructure to comply with these strategies was constructed in late 2002 and early 2003, and is shown in the aerial photograph of the site on Plate 1. For the floodplain, infrastructure includes two extraction wells, and for the terrace includes four extraction wells and interceptor drains in Bob Lee and Many Devils Washes. Ground water removed by the extraction wells and collected in the interceptor drains is pumped through pipelines to an 11-acre pond where it is evaporated (Plate 1). The pond capacity was designed to treat an influent rate of up to 20 gallons per minute (gpm) for 40 years. This remediation system began operation in March 2003.

These procedures, inclusive of the appendices, describe the tasks required to operate, monitor, and maintain the ground water remediation system for the Shiprock site. The following appendices are an integral part of these procedures and shall be read and understood as a prerequisite to conducting operations, monitoring, and maintenance of the ground water remediation system:

- Appendix A Monitoring and Maintenance—Written Description; and Shiprock Operations, Monitoring, and Maintenance Inspection Log
- Appendix B Ground Water Remediation System Emergency Response and Environmental Compliance Guidance
- Appendix C Statement of Understanding
- Appendix D Route to Hospital (Northern Navajo Medical Center Emergency Room)
- Appendix E Job Safety Analysis (JSA) 2003-13

Other reference documents available from the Site Manager or Technical Monitor that provide details on the construction and operation of the system include:

- Flow Data Incorporated, Shiprock, UMTRA Ground Water Remediation Control Operations Guide, Version 1102003.
- Manuals and other literature from equipment manufacturers for components of the remediation system.
- Project as-built drawings.

2.0 Operation of Remediation System

2.1 Contractor and Operation Team

As the Contractor for DOE, Stoller is responsible to DOE for the operation and maintenance of the remediation system at Shiprock. To accomplish this, the Contractor has assembled an Operation Team (hereinafter referred to as Operators), consisting of Stoller personnel and Navajo Nation Abandoned Mine Lands (AML)/UMTRA personnel. Inspections of the remediation system will be conducted periodically by an Operator to ensure the system is functioning correctly and that appropriate maintenance and repairs are made. The Contractor will direct and provide oversight to the Operators inspection activities, and also will provide equipment, materials, and required permits to conduct the inspections.

2.2 Operation Structure and Responsibilities

2.2.1 Site Manager

The Site Manager is the Contractor representative responsible for the ground water management and operation of the remediation system at the site. The Site Manager is the first contact and line of authority for all communications regarding the site and has approval authority for maintenance and field changes with technical direction provided by the Technical Monitor. The Technical Monitor and Operators will report directly to the Site Manager on all aspects of the remediation system operation. The Site Manager is Craig Goodknight at (970) 248-6550.

2.2.2 Technical Monitor

The Technical Monitor is the Contractor representative responsible for all technical aspects of the remediation system and will provide technical direction to the Site Manager and Operators. The Technical Monitor is Melvin Madril at (970) 248-6487.

2.2.3 Operators

The Operators consist of Contractor representatives and Navajo Nation AML/UMTRA representatives. Responsibilities of the Operators include conducting periodic routine inspections of the remediation system along with maintenance and minor repairs of the system, when necessary. The Operators are also responsible for completing the Shiprock Operations, Monitoring, and Maintenance Inspection Log (part of Appendix A), of these procedures, as a

record of their inspection of the remediation system. This Log shall be faxed on the day it is completed to the Contractor to the attention of Ken Pill at (970) 248-7628, office number (970) 248-7787. The Operators also may be required to conduct additional work to monitor, document, and report on repair and maintenance work performed by subcontractors that will occasionally be necessary to keep the remediation system operating correctly. In the case of a power failure or severe storm event (electrical storm, wind and dust storm, storm causing flooding, etc.), an immediate inspection conducted by one or more Operators (designated by the Site Manager) will be necessary. Operators are also responsible for emergency response as described in Section 1.0 of the "Ground Water Remediation System Emergency Response and Environmental Compliance Guidance" (Appendix B), of these procedures.

2.2.4 Health and Safety Manager

The Health and Safety Manager is the Contractor representative responsible for all site health and safety issues and will provide health and safety related technical direction to the Site Manager, Technical Monitor, and Operators. The Health and Safety Manager is Michael Hurshman at (970) 248-6468.

2.2.5 Environmental Compliance Lead

The Environmental Compliance Lead is the Contractor representative responsible for all environmental compliance issues and will provide environmental compliance related technical direction to the Site Manager, Technical Monitor, and Operators, and will notify DOE in the event of a spill. The Environmental Compliance Lead is Robert Bleil at (970) 248-6503. An alternate Contractor contact is Cheri Bahrke, Environmental Services (ES) Manager, at (970) 248-6038.

2.2.6 Quality Assurance Manager

The Quality Assurance Manager is the Contractor representative responsible for all quality assurance issues and will provide quality assurance related technical direction to the Site Manager, Technical Monitor, and Operators. The Quality Assurance Manager is Donna Riddle at (970) 248-6433.

2.2.7 Navajo Engineering and Construction Authority Security Guards

The Navajo Engineering and Construction Authority (NECA) security guards act as a 24-hour incident receiving and reporting service for the remediation system. The security guard occupies the small building at the gate to the NECA facility along the south side of Uranium Boulevard (Plate 1). The Shiprock Navajo Nation AML office is just inside the NECA gate, which is closed at night and on weekends/holidays. The NECA security guards are responsible for shutting down the remediation system at the control panel near the evaporation pond. Training in the shutdown procedure was provided by the Contractor. After shutting down the system, the security guard will contact the Security Officer at the Grand Junction DOE Office at (877) 695-5322 and inform them of the situation. If there is no answer, they will leave a message and then call the Security Officer's cellular telephone at (970) 260-3308. An example of an incident in which the remediation system would be shutdown would be a resident who notices a water leak during the weekend and calls the Shiprock police. The police would then call the designated contact point, the NECA security guard.

2.3 Operation Requirements

2.3.1 Training

Training shall be conducted on site and include a health and safety and hazard communication briefing (Site Safety Briefing covering current hazards, the JSA, and hazards communicated in these procedures) and a thorough understanding of these procedures and all related appendices. Operations, monitoring, and maintenance inspection training shall be conducted by trained personnel until new Operators are trained to conduct inspections on their own and are competent according to Occupational Safety and Health Administration (OSHA) requirements to perform the work. All DOE, Contractor, and Navajo Nation AML/UMTRA personnel that will conduct operations, monitoring, and maintenance of the ground water remediation system are required to attend the training and read and understand these procedures inclusive of appendices and sign a copy of the "Statement of Understanding" (Appendix C), of these procedures. No other training such as Radiological Worker II or Hazardous Waste Training is required.

2.3.2 Inspection Days

Inspections shall be conducted three times each week (Monday, Wednesday, and Friday) during the early part of the operation of the remediation system. As the system becomes more understood and reliable, inspections may be conducted twice or only once per week, as established by the Site Manager. For the three times per week inspections, Operators from the Navajo Nation AML/UMTRA will conduct inspections on Mondays and Fridays, and a Contractor Operator will conduct the Wednesday inspection as an oversight. If a holiday occurs on a Monday, the inspection shall take place on the first business day after the holiday. If a holiday occurs on a Friday, the inspection shall take place on the first business day prior to the holiday. Inclement weather conditions, such as heavy rain or snow, may infrequently delay an inspection. If the weather conditions deteriorate to the point that travel and fieldwork are neither safe nor practical during a scheduled inspection, the inspection shall be conducted on the first unaffected following business day.

2.3.3 Personnel

Only one Operator is required to be on site to conduct each inspection. Both the Contractor and the Navajo Nation AML/UMTRA shall furnish a minimum of three Operators to conduct the inspections.

2.3.4 Equipment

The Contractor will provide tools for the Operators to conduct miscellaneous minor repairs. Major repairs to the system will be made by subcontractors who will furnish appropriate equipment and tools. Both the Contractor and the Navajo Nation AML/UMTRA shall supply the Operators with transportation to conduct the inspections and a cellular telephone for safety and emergency, and require that Level D Personal Protective Equipment be worn by the Operators.

2.3.5 Permits, Licenses, Insurance, and Site Access

The site is on Navajo Nation tribal land, to which the DOE–GJO has access by agreement with the Tribe. The Contractor will obtain right of entry to the site and any required environmental permits from the federal government, Navajo Nation, or State of New Mexico. Navajo Nation AML/UMTRA shall obtain any required licenses and insurance required by the State or Tribal authority to conduct the operations of the remediation system.

2.3.6 Quality Assurance

The Contractor will oversee all fieldwork. The work shall be performed with the requirements, specifications, and procedures set forth herein. Contractor personnel may schedule periodic surveillance visits to verify the Operators compliance with these procedures. These procedures will be revised as conditions or operations change. Controlled copies of these procedures will be issued to the Site Manager, Technical Monitor, Operators, Health and Safety Manager, Environmental Compliance Lead, and Quality Assurance Manager as a minimum. Changes to the procedures shall be indicated by change bars or a summary of changes.

2.3.7 Environmental

Additional information (from that given in this section) on environmental compliance, waste management, and emergency response is in the “Ground Water Remediation System Emergency Response and Environmental Compliance Guidance” (Appendix B).

The Many Devils Wash drain pipeline crosses an environmentally sensitive area that contains populations of the threatened and endangered species, the Mesa Verde cactus. In the event of any proposed or unplanned surface disturbance in the cactus area, contact the Site Manager or Environmental Compliance Lead. To prevent disturbance to the cactus, vehicles must stay on established roadways.

The Operators shall not enter into or cause damage to existing waters and wetland areas in Many Devils Wash, Bob Lee Wash, and on the floodplain. Wetland areas on the floodplain and locations of environmentally sensitive Mesa Verde cactus shall be delineated during Operator training and on the as-built engineering drawings.

Extraction well pump filters require periodic cleaning and replacement. When pump filters are changed out by the Operators, the used filters shall be washed off and disposed of as general trash. Operators shall collect and dispose of in a legal manner, all other work-related trash and excess materials at the end of each work day. The Operators shall maintain proper site housekeeping at all times.

2.3.8 Health and Safety

Additional information (from that given in this section) on health and safety, and emergency response is in the “Ground Water Remediation System Emergency Response and Environmental Compliance Guidance” (Appendix B). In case of emergency, medical phone numbers and directions to the nearest hospital are in the “Route to Hospital (Northern Navajo Medical Center Emergency Room)” (Appendix D).

2.3.8.1 Regulations and Standards

All work performed shall be conducted in accordance with these procedures, safety regulations promulgated by “Job Safety Analysis (JSA) 2003-13” (Appendix E); OSHA regulations: 29 CFR 1926, *Construction Safety Standard*, 29 CFR 1910, *General Industry Standards*; DOE regulations; and the latest revision of applicable local, state, and federal regulations. The JSA and other applicable safety regulations will be covered in the site safety briefing to be held prior to the start of work during the training period. Other than routine maintenance, major maintenance or repairs will be conducted under the *Shiprock Project Safety Plan for Construction and Remedial Actions*.

2.3.8.2 Work Hazards

Hazards associated with the work shall be identified by the Contractor and controls implemented through the latest revision of JSA 2003-13 (Appendix E). The Operators shall be responsible for implementing controls to mitigate hazards identified in the JSA. New hazards associated with the work shall be identified by the Contractor and Operators and controls implemented through an addition to the existing JSA, a new JSA, or Safe Work Permit.

2.3.8.3 Contractor Safety Briefing

Operators shall attend a Contractor safety briefing before conducting any training or fieldwork. The briefing will be held when the Operators first arrive at the site. If circumstances require the use of personnel or visitors who did not attend the safety briefing, individual briefings shall be arranged with the Contractor for all personnel before they begin fieldwork or visit the site.

2.3.8.4 Personal Protective Equipment

Required Level D Personal Protective Equipment (PPE) is as follows:

- Full length work pants;
- Sleeved shirt;
- Sturdy sole safety shoes or leather boots meeting ANSI Z41;
- Leather or cotton work gloves as required;
- Class 75 safety glasses may be required when any type of construction is taking place, in an area where objects may strike the eye, in designated areas, or to perform specific tasks as determined by the Contractor;
- Hearing protection as required by the OSHA standard, Contractors Hearing Conservation Program, and American Conference of Governmental Industrial Hygienist Threshold Limit Values (ACGIH TLV). Hearing protection shall be made available to all exposed employees where noise levels exceed an action level of 82 decibels for an 8-hour time frame as determined by the Contractor;

- Hardhat in accordance with ANSI Z89.1 if an overhead hazard exists as determined by the Contractor.

It is the responsibility of the Operator to supply the aforementioned PPE.

2.3.8.5 Accident Reporting

Immediately report to the Contractor any accident involving personal injury or property damage, however minor, as well as any illness or injury known or suspected to have an occupational cause. Cooperate fully with the Contractor and DOE personnel in any investigation of an accident, illness, or injury.

2.3.8.6 Non-permit Confined Spaces

Non-permit Confined Space Areas: The Bob Lee Wash and Many Devils Wash sumps are identified and posted as non-permit confined space areas. If the sump lids are to be opened or access into the sumps is required, Contractor health and safety management will generate a Safe Work Permit. Under no circumstances shall any personnel open and/or enter the non-permit confined spaces without Contractor oversight, concurrence, per-entry atmospheric monitoring, and a completed Safe Work Permit.

2.3.8.7 Lockout/Tagout

Lockout/tagout refers to the control requirements for operating, servicing, and maintaining equipment, stored-energy systems, or hazardous energy that could unexpectedly start up or energize personnel and cause injury or death. Systems that will require Lockout/Tagout control requirements are the electrical systems providing power to the pumps, the pump control systems, pumps, and pressurized ground water systems flowing to the evaporation pond. All operating, servicing, and maintenance activities at the Shiprock site shall be performed in accordance with the programmatic requirements set forth in the *GJO Health and Safety Manual (GJO 2)*, Standards 2.4 and 2.7. All site personnel shall be trained in the recognition of applicable hazards and energy sources in the workplace and the means necessary for isolation and control of those hazards and energy sources. The Contractor shall assign and log appropriate lockout/tagout equipment to responsible employees for specific assigned tasks. Assigned tasks involving hazardous energy shall be identified with shutdown procedures as well as release from lockout/tagout procedures. JSAs or Safe Work Permits may be used to identify those tasks. The Contractor Health and Safety Manager shall review outside service or subcontractor lockout/tagout procedures for adequacy before starting any tasks, and shall keep all other site employees informed of these tasks. The Contractor shall ensure that these procedures meet the requirements set forth in the *GJO Health and Safety Manual (GJO 2)*, Standards 2.4 and 2.7.

2.3.8.8 Emergency Shutdown Lockout/Tagout

The Operator shall carry the eight (8) locks and sixteen (16) tags located in the Navajo Nation Shiprock AML office when conducting inspections. In the event that an emergency shutdown is required, the locks and tags will be placed on the panels or switches as required in Section 2.4.2, of these procedures, and will not be removed until controls have been established in the programmatic requirements set forth in the *GJO Health and Safety Manual (GJO 2)*, Standards 2.4 and 2.7. Emergency shutdowns require immediate notification according to the

“Ground Water Remediation System Emergency Response and Environmental Compliance Guidance” (Appendix B). Examples of emergencies are accident, vandalism, severe weather damage, or system component failure.

2.3.8.9 Working Over or Near Water

Employees must wear U.S. Coast Guard approved life jackets or buoyant work vests whenever work is performed over or near water where the danger of drowning exists. When the potential for falling into the water exists, employees shall wear life vests, and ring buoys will be placed every 200 feet along the shoreline. One lifeboat shall be immediately available at the location or adjacent to the water, if appropriate, or lifelines and body harnesses shall be provided.

2.3.8.10 Physical Health Hazards

Workers could be exposed to heat stress when the ambient temperature exceeds 70 °F. Hazards related to heat stress can be controlled through proper planning and effective monitoring of personnel. Factors that could affect a worker’s ability to function in extreme heat include physical fitness, acclimatization, age, obesity, alcohol consumption, drug use, infections, and disease. The workload of the individual is a key factor in heat stress. Heat stroke, heat cramps, and heat exhaustion (signs, symptoms, and effects) will be discussed in safety meetings during warm weather. Workers must be encouraged to consume water during work breaks. For subcontracted major repairs and maintenance, the subcontractor will be required by subcontract to provide water for the workers. For the Operators, water is available in the Shiprock Navajo Nation AML office during those work breaks. Workers will be monitored during work periods in warm weather. Minimum work-rest schedule will be followed while performing tasks and wearing level D PPE. Adjust the work-rest regimen according to Table 1.

Table 1. Work-Rest Regimen

Work Load			Work-Rest Regimen
Light °F	Moderate °F	Heavy °F	
86	80	77	Continuous Work
87	82	78	75% work, 25% rest
89	85	82	50% work, 50% rest
90	88	86	25% work, 75% rest

2.3.8.11 Biological Hazards

Biological hazards such as animal bites, spider bites, and insect stings could pose a significant risk to workers at the site (personnel shall notify GJO Contractor Staff immediately of any of these occurrences according to the “Ground Water Remediation System Emergency Response and Environmental Compliance Guidance” (Appendix B). These hazards can cause localized swelling, itching, and minor pain that can be handled by first aid treatment. In sensitized individuals, however, effects can be much more serious. Make no attempt to capture any wild or semi-wild animals, such as cats or rats, due to the possibility of a bite or parasitic infestation. Take extreme care in watching for and avoiding stray dogs to prevent being bitten. Areas that may contain spiders are the wells, sumps, and vaults that have to be checked periodically. Rattlesnakes inhabit the area, but they are rare. Snakebites can result in extreme pain, and in some cases death. First aid for snakebite consists of washing the wound immediately,

immobilizing the affected area, and keeping the affected area lower than the heart if possible. Seek medical attention immediately. During warm weather, pay attention to shady areas where snakes may be present, especially in pits and under rocks, logs, and brush.

2.3.8.12 Site Access

Extreme caution must be exercised when accessing the site in a vehicle and/or on foot during inclement weather and after severe weather events.

2.3.8.13 Slips, Trips, and Fall Hazards

Awareness of hazardous walking/working surfaces is essential for this project. Much of the work will involve walking on loose and uneven surfaces with potentially steep slopes. Caution must be exercised at all times.

2.3.8.14 Equipment and Hand Tools

All hand and power tools will comply with 29 CFR 1926, *Construction Safety Standard*, Subpart I, "Tools - Hand and Power". In general they will be in good repair and will be used only for the job they were designed to do. Caution must be exercised at all times.

2.3.8.15 Industrial Hygiene Requirements

As a best management practice when flushing or changing pump filters, personnel shall wear nitrile gloves and safety glasses with side shields. No industrial hygiene monitoring is required.

2.4 Inspection Procedures

2.4.1 General

Operators shall exercise extreme caution when conducting operations, monitoring, and maintenance of the system. The cellular telephone is the only communication with emergency services while conducting work in the remote areas of the site. However, cellular telephone service is not dependable in the deep canyon areas such as Many Devils Wash. Road and weather conditions must be monitored closely to ensure safe access around the site.

2.4.2 Operations

The pumps for Many Devils Wash, Bob Lee Wash, the floodplain wellfield, and the east terrace wellfield operate continuously. If a pump is not operating and the well is not in a recovery mode between pumping cycles, there is a problem with the system and it should be shutdown according to the procedure in Section 2.4.3, of these procedures. Operators are not authorized to shutdown and/or start pumps or systems unless they are performing a pump filter change out according to Section 1.3.2 of the "Monitoring and Maintenance—Written Description; and Shiprock Operations, Monitoring, and Maintenance Inspection Log" (Appendix A), the Site Manager has directed maintenance or repair work, or an emergency requires a shutdown. All other start ups or shutdowns will be directed by the Contractor. Emergency shutdowns require immediate notification according to the "Ground Water Remediation System Emergency Response and Environmental Compliance Guidance" (Appendix B). Examples of emergencies

are accident, vandalism, severe weather damage, or system component failure. If there is any question or doubt as to whether to initiate a shutdown or the procedure to effect a shutdown of the entire system or an individual pump or system, contact the Technical Monitor or other Contractor staff noted in the Emergency Response Telephone Numbers of the “Ground Water Remediation System Emergency Response and Environmental Compliance Guidance” (Appendix B), or the Contractor representatives in Section 2.2 of these procedures.

2.4.3 Shutdown Procedure

2.4.3.1 Shutdown of Individual Pumps or the Entire System

Procedures to effect a shutdown and lockout/tagout of the individual pumps or the entire ground water remediation system at Many Devils Wash, Bob Lee Wash, the floodplain wellfield, and east terrace wellfield for emergencies are as follows:

- In an emergency, the Operator will decide which is closer to immediately shutdown and lockout/tagout—the control panel at Electrical Service No. 3 or the electrical control panel at the individual pump.
- As soon as the control panel switch or individual control panel pump switch is shutdown, shut the other switch down.
- At the individual pump control panel, move the switch to the off position and lockout the handle and tagout the switch.
- At Electrical Service No. 3 control panel, turn the individual pump switch to the off position and lockout and tagout the switch.
- A shutdown of the entire ground water remediation system for an emergency should first be completed at the control panel at Electrical Service No. 3. Lockout and tagout all eight (8) switches and then proceed to all eight (8) individual pump control panels and lockout and tagout.

2.4.3.2 Shutdown of Damaged Electrical Component or Control Panel

Shutdown procedures for a damaged electrical component or panel are as follows:

- Do not approach a damaged electrical component or panel under any circumstances.
- In the event that the control panel at Electrical Service No. 3 is damaged, lockout and tagout the individual pump control panel switches.
- In the event that an individual pump control panel or well or sump pump electrical component is damaged, lockout and tagout at the control panel at Electrical Service No. 3.
- In the event of damage to Electrical Service No. 1, 2, 3, or 4, lockout and tagout at the control panel at Electrical Service No. 3 and the individual pump control panels.

2.4.4 Monitoring and Maintenance

The “Monitoring and Maintenance—Written Description; and Shiprock Operations, Monitoring, and Maintenance Inspection Log” is included in these procedures as Appendix A. The monitoring section of the written description is presented in the sequence that the Operator shall follow in conducting an inspection of the remediation system. Elements of the remediation system to be checked during the inspection are shown in Plate 1. The maintenance section of the written description presents procedures for routine maintenance on the system to be conducted by the Operators, mainly the flushing and replacing of the pump filters. The Shiprock Operations, Monitoring and Maintenance Inspection Log (hereinafter referred to as the Log) is included as the last part of Appendix A. This 6-page Log shall be completed by the Operator to document the inspection of the system; the Log shall be faxed from the Shiprock Navajo Nation AML office to the Contractor to the attention of Ken Pill at (970) 248-7628.

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Appendix A

Monitoring and Maintenance—Written Description; and Shiprock Operations, Monitoring, and Maintenance Inspection Log

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A1.0 Monitoring and Maintenance—Written Description

A1.1 General

This written description of monitoring and maintenance is designed to follow the sequence that the Operator shall follow to conduct a thorough inspection, document the inspection, and perform routine maintenance of the ground water remediation system.

A1.2 Monitoring

The following written descriptions by page number correspond to the page in the *Shiprock Operations, Monitoring, and Maintenance Inspection Log* (hereinafter referred to as the Log) in Section 2.0 of this appendix.

- Before conducting the inspection, the Operator shall fill in the date of inspection on each page, and the “Operator Identification” section of the Log. Note: when recording the “Time On Site” and “Time Recorded” on the Log, record time in the 24-hour military format (0900, 1240, 1422, etc.).
- The “General Visual Observation Criteria” section of the Log presents a general overview of what the Operator should be observing to conduct a thorough inspection of the entire Shiprock ground water remediation system and site. Criteria are as follows:

Visually observe all well and sump electrical, mechanical, and piping systems for leaks; maintenance requirements; weather, accidental, or vandalism damage; and general condition of the wells, sumps, well vaults, mechanical appurtenances, locks, electrical services, electrical pull boxes, protective pipe bollards, security fences/gates/locks around electrical services and the exterior of the pond, and surrounding area. Visually observe the route of all pipe systems including air relief valves, drain valves, and valve boxes for signs of water leaks — standing, flowing, or unusual muddy conditions; type and number of migratory wildlife in and around standing water; general condition of the roads, ditches, drainage channels, delineator posts, security fences/gates/locks, and electrical pull boxes for weather erosion, accidental, or vandalism damage. Note only problems and/or abnormalities.

- The Operator shall proceed to the evaporation pond entrance gate. Unlock the vehicle gate and enter. Record the information required in the “Well 1095” section
- The “Evaporation Pond Area Visual Observation Criteria” section of the Log presents a general overview of what the Operator should be observing to conduct a thorough inspection of the evaporation pond area. Criteria are as follows:

Visually observe the depth of water in the evaporation pond; water flowing from all system drain pipes; type and number of migratory wildlife in and around the water; general condition of the pond for maintenance requirements; erosion, vandalism, or accidental damage; liner deterioration, tears, and holes; condition of internal pond road, ditches, dike, drainage channels, security fences/gates/locks, warning signs, and

information signs for weather erosion, accidental, or vandalism damage and general wear and tear. In addition, visually check the drain lines for the east terrace 31+00, Many Devils Wash 48+00, and floodplain 65+50 for leaks.

- The operator shall drive slowly and carefully around the evaporation pond road and record in the “Notes on Problems or Abnormalities Found on Visual Observation of Evaporation Pond Area” section any problems and/or abnormalities observed based on the “Evaporation Pond Area Visual Observation Criteria” and the depth of the water on the east and west sides of the evaporation pond.
- When inspection of the evaporation pond is complete, exit the gate and lock it.
- Proceed to Many Devils Wash and, using the “General Visual Observation Criteria” section of the Log, record any problems and/or abnormalities in the “Notes on Problems or Abnormalities Found on Visual Observation of Route to Many Devils Wash” section. In addition, observe drain lines at 30+15 and 12+00, and eight (8) electrical pull boxes.
- Along the route to Many Devils Wash conduct a physical check of the air relief valves at 37+00, 29+00, and 14+00. Record the physical check date and any problems and/or abnormalities in the “Notes on Problems or Abnormalities Found on Visual Observation of the Many Devils Wash Air Relief Valves” section. At Electrical Service No. 4, record any problems and/or abnormalities.
- At the gate to Many Devils Wash sump and pump, stop the vehicle, open and close the gate behind you, and walk on the access ramp down the hill. At the Many Devils Wash pump utility boxes, remove the lids from the boxes. If the pump is not running, turn the manual override switch located on the electrical receptacle to the on position and record the information required in the “Many Devils Wash Pump” section. Immediately turn the manual override switch back to the off position. Record problems and/or abnormalities observed in the “Notes on Problems or Abnormalities” section. Close the gate when exiting Many Devils Wash.
- Proceed to Bob Lee Wash and using the “General Visual Observation Criteria” section of the Log, record any problems and/or abnormalities in the “Notes on Problems or Abnormalities Found on Visual Observation of the Route to Bob Lee Wash” section. In addition, observe gabions, outfall drainage, dissipation pool, and two (2) electrical pull boxes.
- At the vehicle gate to Bob Lee Wash, unlock the gate, enter the wash area, and lock the gate behind you.
- At the Bob Lee Wash pump utility boxes, remove the lids from the boxes and record the information required in the “Bob Lee Wash Pump” section. Record problems and/or abnormalities observed in the “Notes on Problems or Abnormalities” section.
- Along the route to Bob Lee Wash conduct a physical check of the air relief valve at 0+65. Record the physical check date and any problems and/or abnormalities in the “Notes on

Problems or Abnormalities Found on Visual Observation of the Bob Lee Wash Air Relief Valve” section.

- Proceed to the floodplain wellfield and unlock the vehicle gate, enter the floodplain area, and lock the gate behind you. Using the “General Visual Observation Criteria” section of the Log, record any problems and/or abnormalities in the “Notes on Problems or Abnormalities Found on Visual Observation of the Route to the Floodplain” section. In addition, observe the netting at seep 426 and drain lines 00+00 near well 1104 and 1+50 near well 1089.
- Observe the floodplain piping route, drain line at 12+00, escarpment, two (2) electrical pull boxes, and netting at seep 425.
- Record the information required in the “Trench 1 and Trench 2” section. Record the physical check date and any problems and/or abnormalities in the “Notes on Problems or Abnormalities Found on Inspection of the Floodplain Air Relief Valve” section.
- When exiting the floodplain wellfield area, lock the gate behind you.
- Proceed to the east terrace wellfield, starting at the pump utility boxes for well 1078, remove the lids from the boxes and record the information required in the “Well 1078” section. Record problems and/or abnormalities observed in the “Notes on Problems or Abnormalities” section.
- Along the route to the east terrace wellfield on the third Wednesday of the month, conduct a physical check of the air relief valves at 2+00, 11+00, and 28+00. Record the physical check date and any problems and/or abnormalities in the “Notes on Problems or Abnormalities Found on Visual Observation of the East Terrace Air Relief Valves” section.
- At Electrical Service No. 1, record any problems and/or abnormalities in the “Notes on Problems or Abnormalities Found on Visual Observation of Electrical Service No. 1” section.
- At the pump utility boxes for well 1071 record the information required in the “Well 1071” section. Record problems and/or abnormalities observed in the “Notes on Problems or Abnormalities” section.
- At the pump utility boxes for well 0818, record the information required in the “Well 0818” section. Record problems and/or abnormalities observed in the “Notes on Problems or Abnormalities” section.
- At the pump utility boxes for well 1070 and 1096 record the information required in the “Well 1070 and Well 1096” section. Record problems and/or abnormalities observed in the “Notes on Problems or Abnormalities” section
- During the inspection of the east terrace wellfield and traversing around the southeast, south, and southwest sides of the evaporation pond and using the “General Visual Observation Criteria” section of the Log, record any problems and/or abnormalities in the “Notes on Problems or Abnormalities Found on Visual Observation of the Route Through the East

Terrace Wellfield and Traversing the Road Around the Southwest, South, and Southeast Sides of the Pond” section. In addition, observe the condition of the road, ditches, diversion channels, security fences, and warning signs for weather erosion, accidental, or vandalism damage and general condition of the pond. Observe the drain line at 21+50 and twenty-eight (28) electrical pull boxes.

- Record the physical check date and any problems and/or abnormalities in the “Notes on Problems or Abnormalities Found on the Monthly Visual Observation of NECA Gravel Pit and DOE Disposal Cell Air Relief Valves” section.
- If additional space is required to record notes on problems and/or abnormalities or if space is required to record notes unrelated to the sections in the Log, record these in the “Additional or Continued Notes on Problems, Abnormalities, Observations, Comments, and Health and Safety Concerns” section.
- End of Inspection. Fax the completed Log to the attention of Mark Kautsky at the DOE–GJO (970) 248-7628 from the Shiprock Navajo Nation AML office.

A1.3 Maintenance

As a best management practice, Operators shall wear nitrile gloves and safety glasses with side shields when flushing or changing pump filters.

A1.3.1 Pump Filter Flush:

As needed, filters shall be flushed for 3 to 5 seconds following the procedure below:

- Remove filter housing utility box lid to open box (Bob Lee Wash only).
- Pull the green hose end out of the utility box and position the hose at the lowest level on the ground surface outside the utility box (Bob Lee Wash only).
- Turn the red handled valve on the filter to the on position.
- Let the ground water flush through the filter lines and hose for 3 to 5 seconds and then turn the red handled valve to the off position.
- Place the green hose back in the box and replace the filter housing utility box lid (Bob Lee Wash only).

A1.3.2 Pump Filter Change Out

A Contractor Operator shall remove a used pump filter and replace it with a new filter when that Operator judges that the filter is clogged sufficiently to impede flow. The following procedure shall be used to change out each pump filter:

- Perform a pump filter flush following the procedure in Section A1.3.1 of this appendix, with the exception of the step to place the green hose back in the utility box and replacing the filter housing utility box lid.
- Turn off the pump at the manual control.
- Using a one-inch gate valve handle, close the downstream ground water gate valve to the evaporation pond or the ball valve in the vault.
- Turn the red handled valve on the filter to the on position releasing the water pressure through the hose, as if flushing a filter, and then turn the red handled valve to the off position.
- Place a strap wrench over the plastic filter case and turn the case counterclockwise to loosen it. Remove the wrench and continue to remove the case turning it by hand until it is completely free.
- Remove the used filter from the filter housing by hand pulling straight up.
- Used filters shall be washed off and disposed of as general trash.
- Remove the new filter from its wrapping and check for any damage; particularly, check the o-ring on the new filter to ensure that it is not split or cracked.
- Install the new filter with the o-ring down into the filter housing, pushing it in snugly to seat the o-ring. Write the installation date on the new filter with an indelible marker.
- Reinstall the filter case and hand tighten snugly.
- Open the downstream ground water gate valve, or ball valve, to the evaporation pond. Visually check the filter housing and filter case for leaks.
- Turn the pump on to auto mode.
- For the east terrace pumps, immediately place your hand on the handle attached to the gate valve to the evaporation pond; check the pressure gauge and then the flow meter. If the pressure gauge reading exceeds 60 pounds per square inch, open the valve to allow more water to flow through and adjust the valve to the flow rate established by the Contractor on the flow meter (plus or minus 0.15 gpm). If the pressure is less than 60 pounds per square inch, adjust the valve to the flow rate established by the Contractor on the flow meter (plus or minus 0.15 gpm). For the floodplain pumps, immediately place your hand on the handle attached to the gate valve to the evaporation pond; check the pressure gauge and then the

flow meter. Do not allow the pressure gauge reading to exceed 120 pounds per square inch. If it looks as though it will, open the valve to allow more water to flow through and adjust the valve to the flow rate established by the Contractor on the flow meter (plus or minus 0.15 gpm).

- Visually check the filter housing and filter case for leaks.
- If the filter housing and filter case are leaking, tighten the case clockwise with a strap wrench.
- Place the green hose back in the box and replace the utility box lids.

A1.3.3 Other Maintenance and Repairs

No other maintenance tasks will be routinely performed by the Operators other than normal housekeeping and general site cleanup. The Contractor will engineer, direct, and manage all other maintenance and repairs.

A2.0 Shiprock, Operations, Monitoring, and Maintenance Inspection Log

The following six-page log will be used by the operators in their inspections of the remediation system at the Shiprock site:

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U.S. Department of Energy, Grand Junction Office

Shiprock Operations, Monitoring, and Maintenance Inspection Log

Appendix A to the Ground Water Remediation System Operations, Monitoring and Maintenance Procedures

Shiprock, New Mexico, Site

Date: _____

<p align="center">Operator Identification</p> <p>Navajo Nation AML/UMTRA Operator on Site:</p> <p>L. Benally ____ C. Holiday ____ Lawrence Benally ____</p> <p>S.M. Stoller Operator on Site:</p> <p>David Miller _____</p> <p>Jeff Price _____ Other _____</p> <p>Time On Site: _____ to _____</p>	<p align="center">Grand Junction Office Contacts:</p> <p>Area Code - (970)</p> <p>David Miller – 248-6652</p> <p>Dan Nordeen – 248-6467</p> <p>Jeff Price – 248-6592</p> <p>Emergencies After Hours – (877) 695-5322</p> <p>Fax Log To: (970) 248-7628 Attn: Mark Kautsky</p>
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General Visual Observation Criteria

Visually observe all well and sump electrical, mechanical, and piping systems for leaks; maintenance requirements; weather, accidental, or vandalism damage; and general condition of the wells, sumps, well vaults, mechanical appurtenances, locks, electrical services, electrical pull boxes, protective pipe bollards, security fences/gates/locks around electrical services and the exterior of the pond, and surrounding area. Visually observe the route of all pipe systems including air relief valves, drain valves, and valve boxes for signs of water leaks — standing, flowing, or unusual muddy conditions; type and number of migratory wildlife in and around standing water; general condition of the roads, ditches, drainage channels, delineator posts, security fences/gates/locks, and electrical pull boxes for weather erosion, accidental, or vandalism damage. Note only problems and/or abnormalities.

Evaporation Pond Area Visual Observation Criteria

Visually observe the depth of water in the evaporation pond; water flowing from all system drain pipes; type and number of migratory wildlife in and around the water; general condition of the pond for maintenance requirements; erosion, vandalism, or accidental damage; liner deterioration, tears, and holes; condition of internal pond road, ditches, dike, drainage channels, security fences/gates/locks, warning signs, and information signs for weather erosion, accidental, or vandalism damage and general wear and tear. In addition, visually check the drain lines for the east terrace 31+00, Many Devils Wash 48+00, and floodplain 65+50 for leaks.

Notes on Problems or Abnormalities Found on Visual Observation of Evaporation Pond Area and Electrical Service No 3:

Water Depth East: _____ Water Depth West: _____

Time Recorded: _____ **Well 1095 Pump**

Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____

Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____

Notes:

Notes on Problems or Abnormalities Found on Visual Observation of Route to Many Devils Wash:

Observe Drain Lines at 30+15 and 12+00, and Eight (8) Electrical Pull Boxes.

Air Relief Valve 37+00 _____

Air Relief Valve 29+00 _____

Air Relief Valve 14+00 _____

U.S. Department of Energy, Grand Junction Office

Shiprock Operations, Monitoring, and Maintenance Inspection Log

Appendix A to the Ground Water Remediation System Operations, Monitoring and Maintenance Procedures

Shiprock, New Mexico, Site

Date: _____

Time Recorded: _____ **Many Devils Wash Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Notes on Problems or Abnormalities Found on Visual Observation of the Borrow Pit:

Observes, Outfall Drainage, Electrical Service Panels, and Phytoremediation Pilot Test Plots.

Time Recorded: _____ **Well 1091 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Time Recorded: _____ **Well 1092 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Time Recorded: _____ **Well 1093 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Notes on Problems or Abnormalities Found on Visual Observation of the Route to Bob Lee Wash:

Observe Gabions, Outfall Drainage, Dissipation Pool, and Two (2) Electrical Pull Boxes.

Air Relief Valve 0+65

Time Recorded: _____ **Bob Lee Wash Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Notes on Problems or Abnormalities Found on Visual Observation of the Route to the Floodplain:

Observe the netting at Seeps 426 and Drain Lines 00+00 near Well 1104 and 1+50 near Well 1089.

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Shiprock Operations, Monitoring, and Maintenance Inspection Log

Appendix A to the Ground Water Remediation System Operations, Monitoring and Maintenance Procedures

Shiprock, New Mexico, Site

Date: _____

Time Recorded: _____ **Well 1104 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Time Recorded: _____ **Well 1089 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Notes on Problems or Abnormalities Found on the Walk Through Inspection of the Floodplain Piping Route to the Escarpment Toe at 12+00:

Observe Floodplain Piping Route, Drain Line at 12+00, Escarpment, Two (2) Electrical Pull Boxes, Electrical Service Panels, and Netting at Seep 425.

Air Relief Valve 6+55

Time Recorded: _____ **Trench (1) 1110 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Time Recorded: _____ **Trench (2) 1109 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Notes on Problems or Abnormalities Found on Visual Observation of the East Terrace Wellfield, Air Relief Valves, and Electrical Service No. 1, and Traversing the Road Around the Southwest, South, and Southeast Sides of the Pond:

Observe the condition of the road, ditches, diversion channels, security fences, and warning signs for weather erosion, accidental, or vandalism damage, and general condition of the Pond. Observe Drain Line at 21+50 and Twenty Eight (28) Electrical Pull Boxes.

Air Relief Valve 2+00 _____
Air Relief Valve 11+00 _____
Air Relief Valve 28+00 _____

Time Recorded: _____ **Well 1078 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

U.S. Department of Energy, Grand Junction Office

Shiprock Operations, Monitoring, and Maintenance Inspection Log

Appendix A to the Ground Water Remediation System Operations, Monitoring and Maintenance Procedures

Shiprock, New Mexico, Site

Date: _____

Time Recorded: _____ **Well 1071 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Time Recorded: _____ **Well 818 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Time Recorded: _____ **Well 1070 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Time Recorded: _____ **Well 1096 Pump**
Flow GPM: _____ Total 1: _____ Flush Filter: Yes _____ No _____
Pressure: _____ Total 1: _____ Change Filter: Yes _____ No _____
Notes:

Notes on Problems or Abnormalities Found on Visual Observation of the Route Through the NECA Gravel Pit and DOE Disposal Cell:

Observe the Upper Floodplain Wellfiled Pipeline Route, Drain Lines at 51+00 and 47+00, Electrical Service No. 2, Two Valve Boxes near 17+00, the Upper Outfall Drainage Area, and Sixteen (16) Electrical Pull Boxes.

- Air Relief Valve 64+00 _____
- Air Relief Valve 45+00 _____
- Air Relief Valve 36+00 _____
- Air Relief Valve 20+50 _____
- Air Relief Valve 17+00 _____

Additional or Continued Notes on Problems, Abnormalities, Observations, Comments, and Health and Safety Concerns.

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Shiprock Operations, Monitoring, and Maintenance Inspection Log
 Appendix A to the Ground Water Remediation System Operations, Monitoring and Maintenance Procedures
 Shiprock, New Mexico, UMTRA Ground Water Remediation Project
 Date: _____

<p>Well 1078</p> <p>Time Recorded: _____</p> <p>Flow GPM: _____</p> <p>Pressure: _____</p> <p>Cumulative Flow: _____</p> <p>Adjust GPM: Yes _____ No _____</p> <p>Flush Filter: Yes _____ No _____</p> <p>Change Filter: Yes _____ No _____</p>	<p>Notes on Problems or Abnormalities:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
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<p>Notes on Problems or Abnormalities Found on Visual Observation of the East Terrace Air Relief Valves:</p>
<p>Conduct a Physical Check on the Third Wednesday of the Month. Physical Check Date: _____</p> <p>Valve: _____ Notes: _____</p> <p>Air Relief Valve 2+00 _____</p> <p>Air Relief Valve 11+00 _____</p> <p>Air Relief Valve 28+00 _____</p>

<p>Notes on Problems or Abnormalities Found on Visual Observation of Electrical Service No. 1:</p>
<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

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Shiprock Operations, Monitoring, and Maintenance Inspection Log

Appendix A to the Ground Water Remediation System Operations, Monitoring and Maintenance Procedures

Shiprock, New Mexico, UMTRA Ground Water Remediation Project

Date: _____

<p>Well 1071</p> <p>Time Recorded: _____</p> <p>Flow GPM: _____</p> <p>Pressure: _____</p> <p>Cumulative Flow: _____</p> <p>Adjust GPM: Yes _____ No _____</p> <p>Flush Filter: Yes _____ No _____</p> <p>Change Filter: Yes _____ No _____</p>	<p>Notes on Problems or Abnormalities:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Well 0818</p> <p>Time Recorded: _____</p> <p>Flow GPM: _____</p> <p>Pressure: _____</p> <p>Cumulative Flow: _____</p> <p>Adjust GPM: Yes _____ No _____</p> <p>Flush Filter: Yes _____ No _____</p> <p>Change Filter: Yes _____ No _____</p>	<p>Notes on Problems or Abnormalities:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Well 1070</p> <p>Time Recorded: _____</p> <p>Flow GPM: _____</p> <p>Pressure: _____</p> <p>Cumulative Flow: _____</p> <p>Adjust GPM: Yes _____ No _____</p> <p>Flush Filter: Yes _____ No _____</p> <p>Change Filter: Yes _____ No _____</p>	<p>Notes on Problems or Abnormalities:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Notes on Problems or Abnormalities Found on Visual Observation of the Route Through the East Terrace Wellfield and Traversing the Road Around the Southwest, South, and Southeast Sides of the Pond:</p> <p>Observe the condition of the road, ditches, diversion channels, security fences, and warning signs for weather erosion, accidental, or vandalism damage, and general condition of the Pond. Observe Drain Line at 21+50 and Twenty Eight (28) Electrical Pull Boxes.</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	

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Shiprock Operations, Monitoring, and Maintenance Inspection Log

Appendix A to the Ground Water Remediation System Operations, Monitoring and Maintenance Procedures

Shiprock, New Mexico, UMTRA Ground Water Remediation Project

Date: _____

Notes on Problems or Abnormalities Found on Visual Observation of the Route Through the NECA Gravel Pit and DOE Disposal Cell:

Conduct an Inspection on the Fourth Wednesday of the Month. Inspection Date: _____

Observe the Upper Floodplain Wellfilled Pipeline Route, Drain Lines at 51+00 and 47+00, Electrical Service No. 2, Two Valve Boxes near 17+00, the Upper Outfall Drainage Area, and Sixteen (16) Electrical Pull Boxes.

Notes on Problems or Abnormalities Found on the Monthly Visual Observation of NECA Gravel Pit and DOE Disposal Cell Air Relief Valves:

Conduct a Physical Check on the Fourth Wednesday of the Month. Physical Check Date: _____

Valve: _____ Notes: _____

Air Relief Valve 64+00 _____

Air Relief Valve 45+00 _____

Air Relief Valve 36+00 _____

Air Relief Valve 20+50 _____

Air Relief Valve 17+00 _____

Additional or Continued Notes on Problems, Abnormalities, Observations, Comments, and Health and Safety Concerns.

Appendix B

Ground Water Remediation System Emergency Response and Environmental Compliance Guidance

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1.0 Introduction

This guidance will be used in the event of an emergency or spill and complies with Sections 8.4 and 8.5 of the *GJO Environmental Compliance Manual* (GJO 11).

2.0 Emergency Response Contacts

In the event of an emergency or unanticipated event, the following personnel shall be contacted immediately. Once the emergency is under control, and as soon as possible, the Site Manager and support organizations are contacted. They in turn will contact DOE and regulatory agencies as appropriate.

Emergency Response Telephone Numbers

Fire or Electrical Emergency911

Navajo Fire Department – Shiprock(505) 368-1350 or (505) 368-1351

Medical Emergency911

Indian Health Service (hospital and ambulance) – Shiprock(505) 368-6175

Emergency Room - Shiprock.....(505) 368-6600

Vehicle Accident or Criminal Activity911

Navajo Police Department - Shiprock(505) 368-1350 or (505) 368-1351

Spill or Unanticipated Operational Event

GJO Contractor staff (during work hours) See Below

If there is no answer, leave messages on Contractor staff phones and then dial (877) 695-5322

If there is no answer, leave a message, then dial(970) 248-6000

Off-hours/Weekends Spill or Unanticipated Operational Event

Grand Junction Office Security Officer(877) 695-5322

If there is no answer, leave a message, then dial the Security Cellular Telephone
.....(970) 260-3308

Grand Junction Office - Contractor Staff

Project Management: Craig Goodknight, Site Manager (970) 248-6550

Melvin Madril, Technical Monitor (970) 248-6487

Health and Safety: Mike Hurshman (970) 248-6468

Environmental Compliance: Robert Bleil (or) (970) 248-6503
 Cheri Bahrke,
 Environmental Services Manager (970) 248-6038

Grand Junction Office - DOE Staff

Project Management: Don Metzler (970) 248-7612

3.0 Emergency Notification Checklist

Provide the following information to the emergency responder:

1. Your name and telephone number for return calls.
2. Shiprock site and describe the location on site.
3. Your organization or the name of your company.
4. Describe the nature of the emergency:

_____Spill (water from remediation system or types of chemicals, fluids, and amounts)

_____Fire (probable cause) _____Medical (see below)

_____Injuries (probable cause; number and severity)

5. Emergency services you need immediately:

_____Police _____Fire Dept _____Ambulance

_____Air Life _____Spill Support

Medical Information

6. How many people are injured? _____ Probable cause of injuries? _____
7. What types of injuries? _____ Minor _____ Moderate _____ Severe
8. Is anyone trapped? _____ No _____ Yes..... How many? _____

REMEMBER:

- Evacuate and secure the area.
- Administer CPR/First Aid if trained and qualified.
- Have someone available to flag down and direct emergency crews as they arrive.

Complete after the Emergency:

Date: _____ **Time:** _____ **Operator:** _____

Emergency Service Contacted _____

Emergency No.: _____

4.0 Spill Prevention and Response

This procedure is developed to ensure that personnel are able to respond appropriately to spills at the Shiprock site. Prevention, mitigation, notification, reports, cleanup, and disposal of spill material are addressed in this procedure.

4.1 Responsibilities

The Operator has the responsibility to **report immediately all spill incidents and potential spill incidents to contractor staff listed in Section 2.0 of this appendix**. Contractor project management is responsible for briefing DOE and Contractor ES. DOE and Contractor ES have the responsibility for communicating spills and environmental incidents to Navajo Nation AML/UMTRA, Navajo Nation EPA, Navajo Nation Fish and Wildlife Department, and federal and state regulators.

In the event of a spill, the Operator has the responsibility to direct emergency response actions, including:

- Ensuring that the scene is secured.
- Contacting Contractor Project Management or GJO Security and providing emergency notification and spill information.
- Providing directions to responders.
- Requesting additional assistance as needed.
- Ensuring that access is limited to authorized personnel.
- Ensuring that the Mesa Verde cactus areas are protected as appropriate.
- Requiring site personnel involved to document incidents, responses, and mitigation actions.
- Submitting a compilation of this documentation to the Site Manager within two working days or as specified by project management.

The Operator shall determine the magnitude of the emergency and confer (jointly) with Contractor Project Management, Health and Safety, ES, and DOE Project Management on decisions regarding mitigation measures, worker safety, regulatory notifications, and corrective

actions for spills; and Environmental and Health and Safety follow-up response actions, as necessary.

Contractor Project Management is also responsible for:

- Conducting follow-up investigations.
- Ensuring site personnel are properly trained and have the necessary equipment and supplies to respond to an emergency and to conduct cleanup operations.
- Conferring with ES to address off-site disposition of spill material.

4.2 Spill Prevention

To minimize the potential for spills, leaks, or releases to occur, all piping systems will be inspected to ensure that there are no leaks.

- Inspections shall be conducted routinely (at least daily) during testing, and documented.
- Inspections shall take place at a minimum twice a week during operation.
- Inspection information shall be recorded on the Log.
- All items requiring maintenance shall be identified on the inspection forms.
- Maintenance shall be scheduled, approved, and completed as soon as possible.

Operators shall give close attention to preventing spills during equipment maintenance activities on pumps, valves, or other mechanical devices requiring hydraulic fluids, antifreeze, oil, or fuel.

Operators are responsible for managing emergencies or unanticipated events and shall carry a cellular telephone. The phone must be capable of communicating with the off-site (nearest) emergency response agencies, Contractor Project Management, and the GJO Security officer telephone listed in Section 2.0, of this appendix.

4.3 Spill Response

Sources of spills at the Shiprock site include vehicle fluids and ground water from valve or pipeline leaks. Because operation of the ground water remediation system is over existing contaminated ground water, life-threatening emergencies are not anticipated. If they do occur, the Operator will be responsible for contacting local emergency response organizations such as the nearest fire department, police department, and medical emergency services, as necessary. Follow up contact with Contractor Project Management will be completed as soon as possible after first aid has been rendered. See the Emergency Response Telephone Numbers, Section 2.0, of this appendix, for local emergency assistance numbers and a GJO Contractor staff contact list. Minor spill response actions are addressed below.

Petroleum Product Spills (Equipment or Vehicles)

The following actions are in initial response to a petroleum product spill:

- Take immediate action to stop further spilling and to contain the spill.
- Warn others.
- Isolate the area.
- Ensure that the spill poses no immediate hazards by removing all potential fire hazards.
- Avoid vapor inhalation and skin contact with the spilled material.
- Notify the GJO Contractor staff, who will make appropriate follow-up notifications.

Spill cleanup of petroleum products should entail:

- Removing all of the stained soil and over-excavating by several inches.
- Placing the excavated material on a plastic tarpaulin.
- Periodically mixing the soil with a shovel or by lifting the corners of the tarp and alternating ends to roll the material.

When the soil no longer contains a concentration of flammable material, the material can be disposed of at a municipal landfill.

Ground Water Spills, Leaks, or Releases

For ground water spills, leaks, or releases the rules for initial response are the same as petroleum spills.

Depending on the size of the spill, follow-up or secondary responses may include:

- Shutdown and isolation of the leaking system
- Determine the extent of the spill (Operator)
- Contact ES if the spill is in a Mesa Verde cactus area (along the pipeline route to Many Devils Wash)
- Establish contamination control zones (Operator)
- Contain the spill with berms or other containment devices

5.0 Medical Response Procedure

This procedure establishes initial response and procedures for reporting incidents involving medical emergencies.

5.1 Definitions

Medical emergency: Any actual or potential life-threatening injury or illness, including, but not limited to: head, face, and neck traumas; amputations; fractures; cuts and lacerations; bites and stings; chemical and thermal burns; heat and cold injuries; and chemical exposures.

First aid and CPR-trained personnel: Any person who is certified by the American Red Cross or the U.S. Bureau of Mines or has received equivalent training that is verifiable by appropriate documentation. Personnel trained in first aid and CPR will render aid consistent with the training they have received.

5.2 Initial Response to Medical Emergencies

The first employee on the scene will:

- Check to ensure that the emergency scene area is safe to enter (i.e. fire, electrical lines, water, etc.) and determine the cause of the emergency and number of victims.
- Call 911 local emergency responders per Section 2.0, of this appendix, or send someone else to place the call.
- Care for the patient and begin first aid procedures (Airway, Breathing, Circulation), then injury treatment – only if trained and all hazards that can cause injury or illness to the responding personnel have been neutralized.
- Direct emergency responders to the scene of the emergency.
- Stop activity and secure any equipment that may have caused the emergency.
- Warn all personnel in the immediate vicinity of the medical emergency.
- Notify GJO Contractor staff as listed in Section 2.0, of this appendix.

Never move a victim in need of medical assistance unless:

- Directed by a competent medical authority.
- It is clear that the injury will not be aggravated or complicated by the move.
- The victim is in a location where greater physical harm would be likely if not moved.

Although all employees are responsible for immediate action, and all employees are expected to carry out those actions, no employee is required to render first aid for which they are not trained.

Never delay the access of a responder to a medical emergency to apply administrative controls. Under no circumstances will decontamination take precedence over treatment of a victim unless a competent medical authority agrees that the medical treatment has a lower priority.

6.0 Written Reporting Requirements

- Written reporting requirements will follow the requirements of *GJO Health and Safety Manual* GJO-2, Chapter 4, “Investigation and Reporting of Off Normal Occurrences.”
- GJO Contractor staff shall report all accidents and injury incidents using the Incident/Safety Report form (GJO 1743).
- GJO Contractor staff will determine reporting requirements for ground water and all other leaks, spills, and releases.
- Within 24 hours of the incident, the Operator and site project management will initiate the critiquing procedure outlined in the *GJO Health and Safety Manual* GJO-2, Standard 4.5, “Investigations and Reports.” Reports shall be submitted as soon as practicable following stabilization of the emergency condition.
- All personnel involved in an event will attend a post-incident analysis meeting to summarize the incident report.
- All incident investigation reports will be submitted in accordance with *GJO Health and Safety Manual* GJO-2, Chapter 4. Records of the report and documentation of corrective actions taken will be maintained by Health and Safety. Copies of incident documentation will be maintained in project files.
- All spills or releases of petroleum products, hazardous substances, or residual radioactive material (RRM) must be reported using the Incident/Safety Report form (GJO 1743) regardless of the quantity of the spill or the activity involved.
- Lessons learned from the critique and investigation shall be formally documented and distributed in an effort to prevent similar incidents in accordance with *GJO Quality Assurance Manual* (GJO 1), QAI 3.1, “Dissemination of Lessons Learned.” Lessons learned also will be used to institute corrective measures and to improve this spill response plan.

7.0 Waste Management and Minimization

This procedure is developed to manage wastes resulting from the operations of a ground water evaporation system, in compliance with Federal, State, and Navajo Nation regulations and DOE orders, and in accordance with best management practices where regulations do not apply.

7.1 Waste Types

Wastes at the site may include

- Used oils and other petroleum products.
- Pump parts, filters, and other maintenance debris.
- General trash.

7.2 Waste Minimization

The following practices will keep on-site waste at a minimum:

- Materials determined to be unnecessary will be returned, recycled, or excessed.
- Used oils will be recycled, using an authorized recycling facility.
- Paper, cardboard, aluminum, wood, and plastic will be recycled if facilities are available.
- Miscellaneous debris will be evaluated for potential reuse or recycle.

Used oils: Used oils, hydraulic fluids, and other petroleum products will be placed in a 55-gallon drum and recycled when the drum is full. Contactor ES at the GJO will provide shipping documentation requirements.

Maintenance debris: Pump parts and maintenance debris will be evaluated for recycle or reuse. If this material is radiologically contaminated, it will be decontaminated and recycled or disposed of as RRM in the DOE Grand Junction disposal cell.

Trash: General trash will be separated into various categories of recyclable materials and managed accordingly. Unusable trash and debris will be disposed of at a municipal landfill.

8.0 Training

Personnel shall be required to read and familiarize themselves with the requirements of this appendix. They shall have an adequate understanding of the hazardous materials and wastes they are handling, including exposure routes and effects on human health.

Appendix C
Statement of Understanding

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Statement of Understanding

Appendix C to the Ground Water Remediation System Operations, Monitoring, and Maintenance Procedures

I, the undersigned, have attended the required training and read and understood the Ground Water Remediation System Operations, Monitoring, and Maintenance Procedures inclusive of appendices for the Shiprock, New Mexico, UMTRA Ground Water Project.

	Name (Please Print)	Signature	Date	Organization
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
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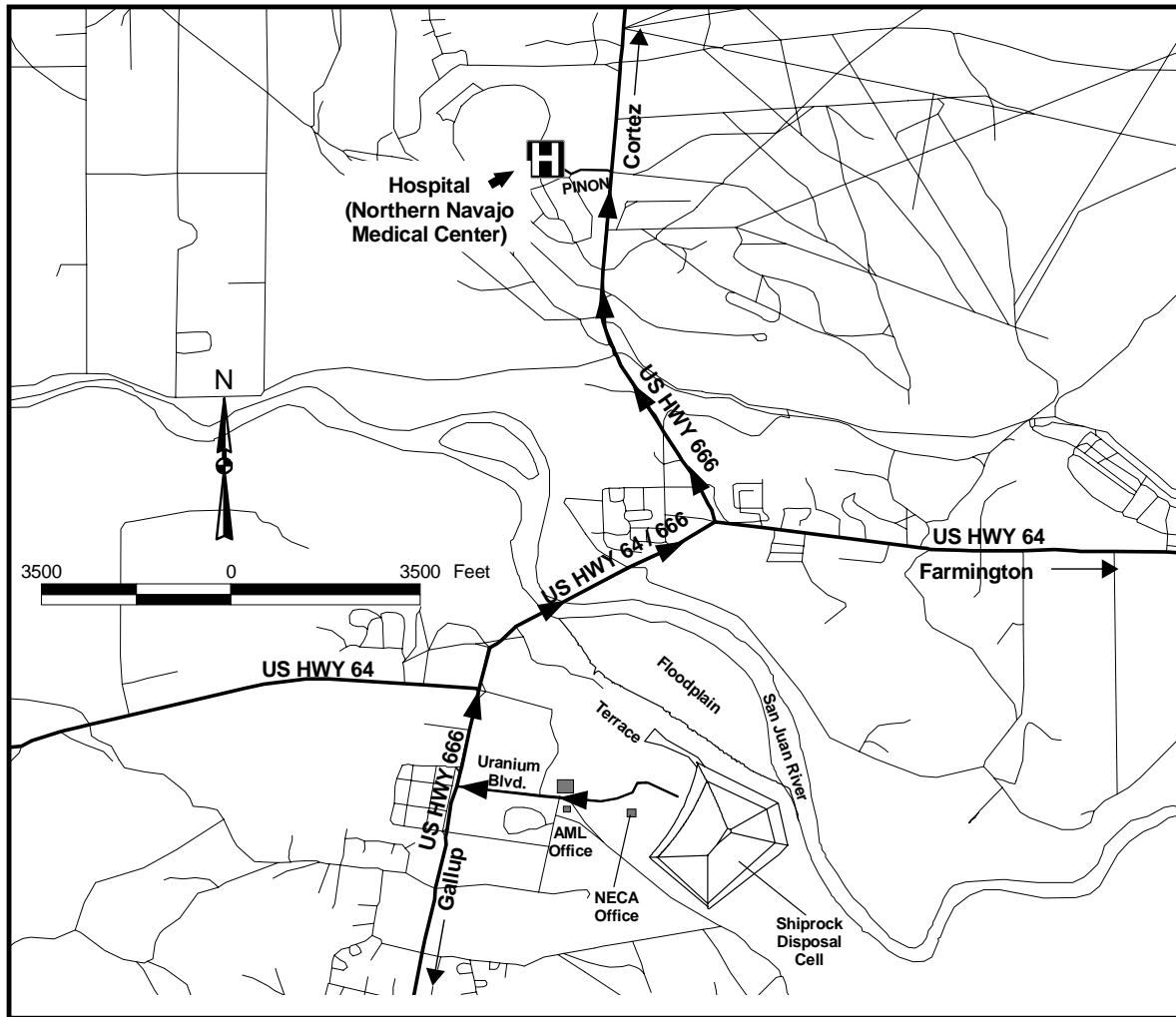
Appendix D

Route to Hospital (Northern Navajo Medical Center Emergency Room)

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Appendix D to the Ground Water Remediation System Operations, Monitoring, and Maintenance Procedures

Route to Hospital (Northern Navajo Medical Center Emergency Room)



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Medical Phone Numbers			
Primary		Secondary	
Emergency			
Northern Navajo Medical Center 1.3 miles north of the junction of U.S. Highway 64 and 666 (center of Shiprock). (505)368-6001 or 1-800-549-5644		Ambulance	911 or 368-6175 or 1350
		Fire and Rescue	911 or 368-1350 or 1351
		Navajo Police	911 or 368-1350 or 1351
		EMT	911 or 368-6175
Air Ambulance Service			
Farmington, New Mexico 1-800-452-9990	Air Care	St. Mary's Air Life 1-800-332-4923	Grand Junction, Colorado

Route to Nearest Telephone

Operators will have a cellular telephone during their inspections. A phone is located in the NECA office and in the AML office, both just west of the disposal cell.

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Appendix E

Job Safety Analysis (JSA) 2003-13

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Job Safety Analysis Cover Sheet

Job Description: Shiprock Ground Water Extraction System		JSA Number: 2003-13, REV. 1 Appendix E, to the Ground Water Remediation System Operations, Monitoring, and Maintenance Procedures	
Task: Operations, Monitoring, and Maintenance of the Ground Water Extraction and Evaporation System		Building or Job Site: Shiprock, NM Disposal Cell	
Prepared By: Mark E. Reed	Reviewed by Health and Safety: Mike Hurshman	Date of Issue: 03/03/03 Revision Date: 3/25/03	
Safety Equipment Required: First Aid Kit Safety Glasses with Side Shields Steel Toe Shoes Nitrile Surgical Gloves Leather Gloves		Hazard Identification: Flying Debris Electrical Back Injury Dermal Slips, Trips, Falls Driving Confined Space Working Near Evaporation Pond Water Hazardous Energy Snakes, Scorpions, Spiders, and Wasps	
Job Preparation: Review Job Safety Analysis Inspect Equipment Daily Receive Extraction System Operations Training and Site Briefing		Tools and Equipment Required: In-Line Water Filters Filter Casing Removal Tool Cellular Telephone for Emergency Communications	

JOB STEP	HAZARD	HAZARD CONTROL OR PROTECTIVE EQUIPMENT
1. Operations and Maintenance of Extraction/Evaporation System. Task including monitoring flow meters, flushing and changing filters, and inspecting pond liner.	Driving	Inspect vehicle prior to operating, use defensive driving techniques, obey all posted signs, use caution on site due to the uneven terrain, on-site dirt roads become very slick when wet conditions exist.
	Slips, Trips, and Falls	Be aware of uneven terrain, keep work area clean and remove slip and trip hazards if possible.
	Back Injury	Use correct lifting form, get help with heavy or awkward items, use mechanical means when necessary (hand cart, heavy equipment).
	Dermal	Wear surgical nitrile gloves while changing out treatment system filters. Contact Environmental Services for proper disposal of used in-line water filters.
	Eye Injury from Flying Particles	Wear safety glasses with side shields when exposed to flying particles or splash hazards.
	Hand Tools	Inspect all hand tools prior to use and remove those from service that are unserviceable, hearing protection for those

JOB STEP	HAZARD	HAZARD CONTROL OR PROTECTIVE EQUIPMENT
		that that exceed noise level limits, wear leather work gloves to protect from cuts, scrapes etc., keep hands and fingers out of pinch points associated with power tools. Make sure all manufacturer supplied guards are in place.
	Working Near Water	Maintain safe distance from the evaporation pond (5 feet from the edge of the liner) while performing inspections. If there is a need for work to be performed in or near the pond a separate Safe Work Permit will be written, contact H&S for guidance.
	Confined Space Entry (man hole sumps)	For entry into manhole sumps follow confined space entry protocol; contact H&S prior to entry.
	Uncontrolled Hazardous Energy	Workers must be trained on the Extraction Treatment System Operations Procedure prior to performing maintenance. Workers will be required to turn the power off and close down stream valve to prevent running water through the system while filter change out occurs.

Job Safety Analysis Signature Sheet

O & M of the Ground Water Extraction and Evaporation System

JSA Number: 2003-13, Rev. 1

JSA Briefing Signatures (Print)	Signature	Date



02+00 ★	Air Relief Valve	0425 ○	Seep Location	— — —	Fence	— — —	River	— — —	Contour (10 foot)
21+50 ■	Drain Line	1071 ●	Extraction Well	— — —	Gate	— — —	Stream	— — —	Contour (2 Foot)
17+00 ▲	Valve Box	— — —	Concrete	— — —	Road	— — —	Pipe, Utility or Tank	— — —	ES #1
		— — —	Culvert	— — —	Ditch	— — —	Electrical Service Location		

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO

Work Performed by
S.M. Stoller Corporation
Under DOE Contract
No. DE-AC01-07LM00060

Plate 1: Shiprock, New Mexico
UMTRA Project Site
Ground Water Remediation System

DATE PREPARED: June 13, 2003 FILENAME: U0180800-01

