Department of Energy
Washington, DC 20585

July 26, 2021

Nancy G. Milburn
Arnold & Porter Kaye Scholer LLP
250 West 55th Street
New York, NY 10019-9710

Via email: nancy.milburn@arnoldporter.com

Re: FIA-21-0002 (HQ-2020-01130-F)

Dear Ms. Milburn:

This is a final response to the request for information that you sent to the Department of Energy (DOE) under the Freedom of Information Act (FOIA), 5 U.S.C. § 552. You requested the following:

A. Annual reports on the Strategic Petroleum Reserves which reference the West Hackberry Strategic Petroleum Reserve, including annual environmental reports and reports issued pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), for 1977-2018, *except* for reports relating exclusively to oceanographic and offshore activities, and *except* for the following reports, which are publicly available:

1. **1989 Strategic Petroleum Reserve Environmental Site Report**
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B. All records relating to brine operations conducted prior to the development of the West Hackberry Strategic Petroleum Reserve on or

near the property now owned by the federal government for purposes of operating the West Hackberry Strategic Petroleum Reserve, including without limitation brine operations performed by Mathieson Alkali Works, Inc., Mathieson Chemical Corporation, Olin Mathieson Chemical Corporation, and/or Olin Corporation;

C. All records relating to hydrocarbon storage operations conducted prior to the development of the West Hackberry Strategic Petroleum Reserve on or near the property now owned by the federal government for purposes of operating the West Hackberry Strategic Petroleum Reserve, including without limitation hydrocarbon storage operations performed by Cities Service Refining Corporation, Cities Service Oil Company, and/or Cities Service Company;

D. All records relating to releases of brine in or around the West Hackberry Strategic Petroleum Reserve area, including in connection with the use of injection wells, pits, ditches or ponds for brine disposal (excluding documents relating exclusively to offshore brine releases);

E. All records relating to spills or releases of chemicals or harmful or potentially harmful materials in or around the West Hackberry Strategic Petroleum Reserve area;

F. All reports relating to environmental impacts associated with, the construction, use, maintenance, or other activities of the West Hackberry Strategic Petroleum Reserve, including but not limited to geological impacts, hydrogeological impacts, impacts to surface water, ecological impacts, land loss, or contamination, excluding documents relating exclusively to offshore or oceanographic impacts;

G. All reports relating to monitoring, assessment, or observation of any potential environmental impacts associated with the West Hackberry Strategic Petroleum Reserve, excluding documents relating exclusively to offshore or oceanographic impacts;

H. All records relating to remediation, restoration, or other restorative work performed or contemplated by the DOE or others to address environmental impacts potentially or actually caused by the West Hackberry Strategic Petroleum Reserve;

I. All records relating to leases granted by DOE or other federal entities for use of federally-owned land in the West Hackberry Strategic Petroleum Reserve area.

In an February 25, 2021, email with Iwetta Pyc, formerly with this office, you agreed to waive the production of publicly available documents responsive to the Request.

Your request was assigned to DOE's Office of Fossil Energy (FE) to conduct a search of its files for responsive documents. DOE started its search on January 14, 2021, which is the cutoff date for responsive documents. In an October 31, 2019, email from Nicholas Mantzaris, formerly with this office, you were provided with public links where more responsive documents to item A could be found. On August 28, 2020, DOE provided you a final response with six (6) documents. On December 11, 2020 DOE granted your request for an appeal and remanded your request for a new search.

On May 26, 2021, DOE sent you a partial response of nineteen (19) documents pertaining to Item A of your request. DOE has completed its search for documents and located nine (9) documents responsive to items B, D, E, G and H of your request. An extensive search did not result in any documents responsive to items C and I. The documents are being released to you as described in the accompanying index.

Exemption 5 of the FOIA protects from mandatory disclosure of "inter-agency or intra-agency memoranda or letters that would not be available by law to a party other than an agency in litigation with the agency…." 5 U.S.C. § 552(b)(5). Exemption 5 incorporates the deliberative process privilege which protects recommendations, advice, and opinions that are part of the process by which agency decisions and policies are formulated. The information withheld under Exemption 5 consists of inter-agency pre-decisional information.

The Information withheld under Exemption 5 has been deemed pre-decisional and/or deliberative in nature, including strategic discussions and ongoing project status. The information does not represent a final agency position, and its release would compromise the deliberative process by which the government makes its decisions. Withholding this information protects against the premature disclosure of proposed policies regarding personnel matters, protects the candor of intra-agency communications, and prevents confusion to the public that could result from disclosing alternative rationales for agency decisions.

With respect to the discretionary disclosure of deliberative information, the quality of agency decisions would be adversely affected if frank, written discussion of policy matters were inhibited by the knowledge that the content of such discussion might be made public. For this reason, DOE has determined that discretionary disclosure of the deliberative material is not in the public interest because foreseeable harm could result from such disclosure.

Exemption 6 is generally referred to as the "personal privacy" exemption; it provides that the disclosure requirements of FOIA do not apply to "personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy." 5 U.S.C. § 552(b)(6). In applying Exemption 6, the DOE considered:

1) whether a significant privacy interest would be invaded; 2) whether the release of the information would further the public interest by shedding light on the operations or activities of the Government; and 3) whether in balancing the privacy interests against the public interest, disclosure would constitute a clearly unwarranted invasion of privacy.

The information withheld under Exemption 6 consists of personal information belonging to individuals. This information qualifies as "similar files" because it is information in which an individual has a privacy interest. Moreover, releasing the information could subject the individuals to unwarranted or unsolicited communications. Since no public interest would be served by disclosing this information, and since there is a viable privacy interest that would be threatened by such disclosure, Exemption 6 authorizes withholding the information. Therefore, we have determined that the public interest in the information's release does not outweigh the overriding privacy interests in keeping it confidential.

The adequacy of the search may be appealed within 90 calendar days from your receipt of this letter pursuant to 10 C.F.R. § 1004.8. Appeals should be addressed to Director, Office of Hearings and Appeals, HG-1, L'Enfant Plaza, U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, D.C. 20585-1615. The written appeal, including the envelope, must clearly indicate that a FOIA appeal is being made. You may also submit your appeal to OHA.filings@hq.doe.gov, including the phrase "Freedom of Information Appeal" in the subject line (this is the preferred method by the Office of Hearings and Appeals). The appeal must contain all of the elements required by 10 C.F.R. § 1004.8, including a copy of the determination letter. Thereafter, judicial review will be available to you in the Federal District Court either: 1) in the district where you reside; 2) where you have your principal place of business; 3) where DOE's records are situated; or 4) in the District of Columbia.

You may contact DOE's FOIA Public Liaison, Alexander Morris, FOIA Officer, Office of Public Information, at 202-586-5955, or by mail at MA-46/Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C. 20585, for any further assistance and to discuss any aspect of your request. Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows: Office of Government Information Services, National Archives and Records Administration, 8601 Adelphi Road-OGIS, College Park, Maryland 20740-6001, e-mail at ogis@nara.gov; telephone at 202-741-5770; toll free at 1-877-684-6448; or facsimile at 202-741-5769.

If you have any questions about the processing of the request or this letter, you may contact me or Ms. Chidinma Nwosu of my office at:

MA-46/ Forrestal Building
1000 Independence Avenue, S.W.
Washington, D.C. 20585
(202) 586-5922

I appreciate the opportunity to assist you with this matter.

Sincerely,

Alexander C. Morris

Digitally signed by Alexander C. Morris
Date: 2021.07.26 09:43:21 -04'00'

Alexander C. Morris
FOIA Officer
Office of Public Information

INDEX

Request #: Re: FIA-21-0002 (HQ-2020-01130-F)

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DOE has completed its search and has located nine (9) documents responsive to items B-I of your request.

- Three documents *are being released in part, pursuant to Exemptions 5 and 6.*
- Six (6) documents *are being released in their entirety.*

Hazard Evaluation

The information contained in the following tables constitute the principal storage or process handling reservoirs at West Hackberry. Cavern and dike information is presented in a separate table because of the functional relationships between cavern pressure, storage capacity and postulated worst case spill (cavern depressurization). Supplemental information is also provided concerning the confinement capacity of the secondary containment for each cavern well pad. Associated with each storage cavern well pad is a drainage sump, which collects storm water runoff, and an oil-water separator.

Crude oil is supplied to West Hackberry from the SUNOCO Oil Terminal at Nederland, TX, by 42-inch diameter, 43-mile long pipeline. Additionally, crude oil can be supplied to West Hackberry by a 36-inch diameter, 13.6-mile long pipeline that connects the site to the Texaco "Texas 22" pipeline. Spill response plans, procedures, and information associated with the interfacility pipelines is contained in section 6. Additionally, section 6 contains information concerning the valve locations on the offsite pipelines as well as pipeline capacity data.

Table 26-1.a. Hazard Identification Storage Reservoirs

Tank No.	Type or Function	Substance Stored	Quantity Stored (gallons)	Tank Type	Maximum Capacity (gallons)	Failure/ Cause
A-WHT-1	Holding Tank	Slop Oil	Variable	Carbon Steel	294,000	None
A-WHT-12A	Holding Tank	Slop Oil	Variable	Carbon Steel	19,780	None
A-WHT-12B	Holding Tank	Slop Oil	Variable	Carbon Steel	19,780	None
A-WHT-12C	Holding Tank	Slop Oil	Variable	Carbon Steel	19,780	None
A-WHT-12D	Holding Tank	Slop Oil	Variable	Carbon Steel	19,780	None
A-WHT-3	Holding Tank	Equip. Drain Oil	Variable	Carbon Steel	970	None
A-LCSM TK 401	Holding Tank	Slop Oil	Variable	Carbon Steel	19,780	None
A-WHT-4	Reservoir Tank	AFFF	Variable	Carbon Steel	900	None
A-WHT-7	Fuel Tank	Diesel	Variable	Carbon Steel	4,200	None
WHD-T	Fuel Tank	Diesel	Variable	Carbon Steel	2,500	None
WHG-T	Fuel Tank	Gasoline	Variable	Carbon Steel	6,000	None
WHT-13	Fuel Tank	Propane	Variable	Carbon Steel	3,000	None

Table 26-1.b. Hazard Identification Storage Reservoirs
(Solution Mined Salt Dome Storage Caverns)

Cavern Number	Cavern Capacity (gallons	Postulated Worst Case Spill (gallons)	Dike Capacity (gallons)
6	357,000,000	3,150,000	4,242,000
7	562,800,000	3,066,000	5,250,000
8	432,600,000	2,394,000	2,184,000
9	407,400,000	2,268,000	2,604,000
11	369,600,000	1,974,000	1,764,000
101	462,000,000	2,646,000	1,512,000
102	470,400,000	2,688,000	1,470,000
103	466,200,000	2,646,000	1,512,000
104	478,800,000	2,688,000	1,470,000
105	478,800,000	2,688,000	1,470,000
106	470,400,000	2,520,000	1,512,000
107	474,600,000	2,688,000	1,512,000

Table 26-1.b. Hazard Identification Storage Reservoirs
(Solution Mined Salt Dome Storage Caverns) (Continued)

Cavern Number	Cavern Capacity (gallons	Postulated Worst Case Spill (gallons)	Dike Capacity (gallons)
108	474,600,000	2,604,000	1,512,000
109	470,400,000	2,620,000	1,512,000
110	470,400,000	2,688,000	1,722,000
111	470,400,000	2,520,000	1,722,000
112	470,400,000	2,520,000	1,512,000
113	474,600,000	2,646,000	1,722,000
114	470,400,000	2,520,000	1,512,000
115	470,400,000	2,520,000	1,512,000
116	470,400,000	2,646,000	1,512,000
117	470,400,000	2,520,000	1,512,000

Table 26-2. Surface Impoundment

SI No.	Type or Function	Substance Stored	Quantity Stored (gallons)	Surface Area (Dimensions)	Maximum Capacity (gallons)	Failure/ Cause
B-WHT-3	Equipment Drain Sump	Slop Oil	Variable	N/A – Tank	970	None
B-TK-401	Equipment Drain Sump	Slop Oil	Variable	N/A – Tank	5,000	None
North Retention Pond	Storm Drainage	Storm water	Variable	1,200 sq. ft.	14,400	None
3 slop oil tanks						
6 Heat Exchangers						
South Retention Pond	Storm Drainage	Storm water	Variable	1,056 sq. ft.	12,672	None

Hazard Identification

The West Hackberry site is located in Cameron Parish 4 miles west of the Calcasieu Ship Channel, which transports petrochemical products, 20 miles south of Sulphur, LA, and 2 miles north of the Sabine National Wildlife Refuge. The site is approximately 25 miles southwest of Lake Charles, LA. It is 17 miles north of the Gulf of Mexico and 4 miles south of the ICW. Site access is provided by Route 390 and a parish road. Route 390 leads from Hackberry westward, ending shortly after its junction with the parish road that connects to the storage site, and is the only exit from the site. The wind direction is predominantly from the southeast.

Principal hazards associated with operation of the SPR facility on the dome represent relatively minor risks to the public health and safety. The operations of a small number of adjacent production and/or storage facilities could potentially represent prompt hazards for site personnel and nearby populations.

a. West Hackberry Dome Utilization

The West Hackberry salt dome is the largest along the Louisiana Gulf Coast. The dome has been used for a number of purposes in the past. For example, in 1978, the Olin Corporation had brine production facilities on the dome. Cities Services had hydrocarbon and LPG product storage facilities, and hundreds of oil and gas wells were located on and along the dome perimeter. AMOCO Oil owns a considerable part of the marshlands on the northeast half of the dome. The remainder of the dome is privately owned.

b. Warren Petroleum
Warren Petroleum Company has LPG underground storage immediately adjacent to the site, in some cases side by side with SPR caverns. This company has multiple caverns, all of which are used strictly for storage. Its aboveground facilities are within 3/8 mile of the site. LPG and Ethylene are stored in the caverns.

c. Other Underground Storage
The Hackberry site is surrounded by salt dome caverns, which are used primarily for LPG storage, which includes propane, ethane, isobutane, butane, and natural gas of uncertain quantity.

d. Other Facilities Co-Located on the Dome and in the Adjacent Marshland
To the north of the site are a number of small oil and gas production companies. To the west (1/2 mile) and the south (2 miles), Amoco has production wells, small storage tanks, and gas compressors. They are also natural gas producers. More oil wells and storage tanks are located to the east, 1 to 5 miles from the site.

Water Intakes
No public or private drinking water intakes are associated with the waterbodies of the site environs or with any of the connecting waterbodies.

Schools
Hackberry Elementary and Hackberry High School are within 2 miles of the site in the town of Hackberry. Spills or discharges of any volume of oil from the site are not expected to impact the functions of the public or parochial school system of the parish. Vincent Settlement Elementary School is located adjacent to the Lake Charles Meter Station Pipeline and Orangefield High School and Elementary is in near vicinity to the Sun Terminal Pipeline.

Medical Facilities
Several primary health care and trauma facilities serve the region in which the site is located. These facilities are:

- Hackberry Rural Medical Clinic
- Lake Charles Memorial Hospital
- Saint Patrick's Hospital
- West Calcasieu/Cameron Hospital
- Lake Area Medical Center.

Transport to these facilities may be accomplished by either ground or air ambulance.

Residential Areas and Socioeconomic Data
The following is a general breakdown of the census data for Calcasieu Parish:

Category	1990 Census	1994 Update
Total Population	168,134	174,398
Total Households	60,328	62,481
Median Age	31.6	32.6
Median Household Income	$24,375	$26,884

Businesses

Oil Spills from the site are not expected to significantly impact any of the industries listed in Table 26-3. Aquacultural facilities have physical boundaries or barriers that segregate adjacent waterbodies from the containment ponds or propagation shallows. Impact to these facilities could consist of extended closure of water sources for facility use. The economic impact of this effect is currently unassessed and would likely be reconciled on a case-by-case basis in the event of a spill that resulted in damages or losses to such operations.

Table 26-3. Calcasieu County Employment Statistics (1994)
(U.S. Bureau of Statistics)

Description	Number of Employees
Agricultural Services, Forestry, Fisheries	231
Oil and Gas Extraction	581
Mining – Nonmetallic Minerals, Except Fuels	14
General Construction	613
Heavy Construction	1,330
Special Trade Contractors	1,890
Food and Kindred Products	232
Apparel and Other Textile Products	71
Lumber and Wood Products	62
Furniture and Fixtures	34
Paper and Allied Products	33
Printing and Publishing	436
Chemicals and Allied Products	4,436
Petroleum and Coal Products	1804
Rubber and Miscellaneous Plastic Products	91
Stone, Clay and Glass Products	240
Primary Metal Industries	2
Fabricated Metal Products	284
Machinery, Except Electrical	194
Electric and Electronic Equipment	160
Transportation Equipment	2,075
Instruments and Related Products	4
Miscellaneous Manufacturing Industries	39
Total Employment	50,815

Wetlands and Sensitive Environments

Fish and Wildlife (General): A variety of fauna can be found at all times on or near the site. Typical residents of the near-site habitats include the following:

a. Birds

Bird species include mourning dove, mockingbirds, white ibis, egrets, rails, blackbirds, herons, hawks, gulls, terns and a variety of passerines.

b. Mammals

Mammalian species include coyote, white-tailed deer, raccoon, swamp rabbit, muskrat, nutria, river otter, armadillo, squirrels, pocket gophers, and a variety of other rodents.

c. Reptiles/Amphibians
Reptilian/amphibian species include a wide variety of frogs, American alligator, snakes, snapping and soft-shell turtles, and similar species.

Regional Waterbodies - Lakes, Streams, and Ground Water Aquifers
The site is located, regionally, at the southern portion of the Calcasieu River Basin, which encompasses a drainage area of approximately 4,450 square miles. The southern portion of the drainage basin, the area in which West Hackberry is located, is flat marshland dotted with several lakes. The largest lake in the area of the site is Calcasieu Lake, which covers an area of approximately 75 square miles. The Calcasieu River flows into Brown Lake and Calcasieu Pass and empties into the Gulf of Mexico.

Black Lake, located at the northern boundary of the site, is connected with Calcasieu Lake through Black Lake Bayou (also known locally as Kelso Bayou). Black Lake also connects with Brown Lake via Alkali Ditch and the Intracoastal Waterway (ICW).

Table 26-4 describes the characteristics of principal groundwater aquifers and soil type boundaries underlying the site or near-site regions.

Table 26-4. Aquifers Underlying West Hackberry or Near-site Areas

Underlying Aquifer	Depth To Top of Aquifer (meters below land surface)	Overlying Soils	Aquifer Depth (thickness and Range	Water Quality: Degree of Salinity	Principal Utility
Chicot (200, 500, and 700 Foot Sand)	-55 to –90	Silt, clay, and shells which grade upward in coarseness as a function of downward depth through blue-gray sand to shale.	100 feet (about 700 feet in the area of West Hackberry) to over 7,000 feet (under the Gulf of Mexico)	Fresh	Municipal fresh water source for Calcasieu Parish.

Endangered Fauna
Based on information supplied by the U.S. Fish and Wildlife Service in Louisiana, the Louisiana Department of Wildlife and Fisheries, and the EPA Inland Area Contingency Plan (ACP), no endangered plant or animal species are resident at or within a 1-mile radius of the site. Migratory or spawning species may traverse the area during seasonal movements. These movements near the site would be incidental and would not occur because of any habitat uniqueness of the region.

The following paragraphs provide information concerning regional species of concern and are provided for completeness. Spills occurring as the result of site operations would not be expected to impact the habitat of any of these species.

a. Regional Endangered Species (as noted in the Inland ACP; EPA Region VI)

1) Birds
Twenty-seven endangered or threatened species or subspecies of birds are listed as inhabiting or frequenting the northern coastal regions of the Gulf of Mexico. Ten of these species are listed as endangered or threatened at the

Federal level. These species include: brown pelican, bald eagle, peregrine falcon, Attwater's greater prairie chicken, whooping crane, Mississippi sandhill crane, wood stork, piping plover, interior least tern, and red-cockaded woodpecker. The remaining species are listed as endangered or threatened at the state level.

2) Mammals
Federally endangered species of terrestrial mammals listed as inhabiting the Gulf coastal regions include the red wolf and gray bat.

3) Reptiles/Amphibians
Twenty-four species of endangered or threatened reptiles or amphibians are listed as inhabiting the northern Gulf coastal region. These species include alligator, eight species of turtles or tortoises, and eleven species of snakes. Alligators, which once were considered endangered, are numerous in Louisiana wetland areas.

4) Fish
Two species of endangered or threatened fish are known to inhabit near-shore and inland waters of the northern Gulf of Mexico region: the Pallid sturgeon and the Gulf sturgeon, a subspecies of the Atlantic sturgeon.

5) Sea Turtles
Five species of endangered or threatened sea turtles are known to inhabit the waters of the northern Gulf of Mexico. These species are green, hawksbill, Kemp's Ridley, leatherback, and loggerhead.

Protection Strategies for Sensitive Areas
Section 13 contains a listing of sensitive areas surrounding the West Hackberry site and the protection strategies for each area.

Recreational Areas
No public parks or recreation centers are in the vicinity of the site, which would be impacted by a spill, fire, or explosion. The most prevalent form of outdoor recreation in the region environs consists of fishing, seasonal trapping, and hunting. Swimming and pleasure boating is not expected to be significantly impacted because the waterbodies within 5 miles of the site do not lend themselves to such forms of recreation.

Transportation Routes (Air, Land, and Water)

a. Highway Transport
No major highways are within a 5-mile radius of the site.

b. Railway Transport
No major rail transportation systems are within a 5-mile radius of the site.

c. Barge/Ship Transport
The site is within 4 miles of the Calcasieu Ship Channel and the ICW, which are both used to transport petrochemicals and other hazardous products.

d. Pipeline Transport

High-pressure gas pipelines of 4-6 inches are installed all around the rim of the dome, since it lies in an area of oil and gas production. Pipelines crossing the top of the dome primarily transport brine. A natural gas pipeline on the north side of Black Lake Road crosses the site between Caverns 111 and 113. This pipeline is assumed to be a 4-inch Valley Gas natural gas line.

Utilities

A spill from the facility would not impact any base-load electrical power producers. No utility systems or large base-load utilities are operating in the vicinity of the site.

Local Soil Types

Above the caprock of the West Hackberry salt dome is a sequence of unconsolidated silty soils with clayey and silty subsoil belonging to the Crowley-Morey-Mowata Association.

Other Areas of Economic Importance

Spill movement would not significantly impact row crops. The most significant damage would be caused by activities associated with the spill response and cleanup, such as vehicle traffic.

Analysis of the Potential for an Oil Spill

The following statistics relating to oil spill frequency, size, and probability were derived from readily available data supplied by the USCG's Pollution Incident Reporting System (PIRS) reports from the 1980's. To a large degree, operational discharges of oil and accidental spills occur because of human error and are preventable. The data has a built-in conservative skew because increased Federal and state regulatory emphasis during the late 1980's and early 1990's resulted in tangible improvements in operational configurations, procedures, and training. All these improvements serve to reduce the actual statistical risks of an oil discharge to a level below the observed historical frequency.

a. Statistical Probability of Cavern Wellhead Failure

The following data relating to the statistical probability of cavern wellhead failure was developed to support pre-spill response planning. The analysis is based on the spill history of the 122 cavern wellheads of the SPR.

The statistical probability of an individual wellhead failure, from any cause, resulting in the discharge of oil, of any quantity, has been established at 1 in 5,000 per year (2.0E-4 per year).

Facility Reportable Oil Spill History

Table 26-6 describes the oil spill history of the site for the past 10 years.

Table 26-6. West Hackberry Spill History

Year	Location	Quantity (gallons)	Disposition
1985	2" Ball Valve on Triplex Pump	924	Oil was contained by sorbent boom and recovered by vacuum truck. No release or impact to offsite environs. No Notice of Violation
1985	Flange Gasket Failure	64	Area vacuumed, washed; oil returned to the slop oil tank. No release or impact to offsite environs. No Notice of Violation
1985	Flange Gasket Failure	1,260	Area vacuumed, washed; oil returned to the slop oil tank. No release or impact to offsite environs. No Notice of Violation
1985	16 " Low Pressure Pump Return Line	168	Area vacuumed, washed; oil returned to the slop oil tank. No release or impact to offsite environs. No Notice of Violation
1986	Flange Gaskets (Two) on HPPP Piping.	1,260	Spill confined to High Pressure Pump Pad. Area vacuumed and washed. Oil recovered to oil water separator and returned to storage. No release or impact to offsite environs. No Notice of Violation
1986	Cavern 11 Wellhead Packing Retainer	315,000	Wellhead flange mechanical failure caused uncontrolled depressurization of underground cavern. Two Discharge Response Contractor (DRC) companies recovered oil. Contaminated soil was excavated and disposed of as oil field waste. Corrective actions resulted in a complete redesign of the wellhead configuration to prevent a reoccurrence. Notice of violation issued, and later rescinded
1987	NONE	NONE	NONE
1988	Meter Prover Station	126	Area vacuumed, washed; oil returned to the slop oil tank. No release or impact to offsite environs. No Notice of Violation
1988	Fractionation Tank Overflow	1,680	Area Vacuumed and washed. ~ 380 gallons of oil recovered and transferred to slop oil tank. Contaminated debris collected and disposed of by waste disposal contract. No release or impact to offsite environs. No Notice of Violation
1988	Cavern wellhead fitting failure.	210	Oil vacuumed and area washed. No release or impact to offsite environs. No Notice of Violation
1989	Instrument Tubing leak	210	Oil vacuumed and area washed. No release or impact to offsite environs. No Notice of Violation
1989	Instrument Tubing leak, Meter-Prover Station	168	Oil vacuumed and area washed. No release or impact to offsite environs. No Notice of Violation
1989	Flange Gasket Failure	28,644	Oil contained and recovered. Area vacuumed and washed. No release or impact to offsite environs. No Notice of Violation
1989	Flange Gasket Failure	252	Oil vacuumed and area washed. No release or impact to offsite environs. No Notice of Violation
1990	Cavern 117, PRV actuation and release	336	Oil vacuumed and area washed. ~295 gallons recovered to slop oil. No release or impact to offsite environs. No Notice of Violation
1990	Cavern 8, PRV actuation and release.	42	Oil contained, vacuumed, and recovered. No release or impact to offsite environs. No Notice of Violation
1990	Component failure on a 36" Pipe	6,594	6,510 gallons of oil recovered. Contaminated soil removed and disposed of by waste disposal contract. No release or impact to offsite environs. No Notice of Violation
1990	High Pressure Pump Pad 36" By-pass	9,660	Oil contained in site retention pond and recovered. No release or impact to offsite environs. No Notice of Violation
1991	Cavern 6 PRV actuation and release	546	Oil contained and recovered. No release or impact to offsite environs No Notice of Violation
1991	High Pressure Pump Pad Sump Overflow	52	Oil contained in site retention pond and recovered. No release or impact to offsite environs. No Notice of Violation
1991	High Pressure Pump Pad Valve failure	168	Oil contained by sump and recovered. No release or impact to offsite environs. No Notice of Violation
1992	High Pressure Pump Pad Sump Overflow	84	Oil contained and recovered. No release or impact to offsite environs. No Notice of Violation
1992	Vacuum Truck inadvertent discharge	84	Oil contained in anhydrite pond and recovered. No release or impact to offsite environs. No Notice of Violation
1993	Bradenhead Flange, partial failure	128	Oil contained and recovered from the limestone pad area. No release or impact to offsite environs. No Notice of Violation
1993	Abandoned-in-place underground pipe breach.	84	Oil recovered to slop oil tank. No release or impact to offsite environs. No Notice of Violation

Table 26-6. West Hackberry Spill History (Cont'd)

Year	Location	Quantity (gallons)	Disposition
1994	Diesel generator fuel filter glass globe breach.	200	Area flushed with water and vacuumed. Soil excavated and disposed of by contract waste disposal. No release or impact to offsite environs. No Notice of Violation
1995	None	None	None
1996	Cavern 106 manifold drain line	42	Two-inch manifold drain line failed causing discharge of 1 barrel of oil on well pad within secondary containment. Cavern isolation and wellhead valves were locked out. Sorbent used for cleanup; disposed as oily waste. Manifold line replaced. No notice of violation.
1997	Tank 12C	63	Tank 12C was overfilled during vacuum truck offloading, and approximately 1½ barrels leaked from foam overflow. No notice of violation.
1998	None	None	None
1998	Cavern 110 Drain Line	4200	Underground piping leak migrated into examination pit and ditch adjacent to cavern. Response stopped migration before it reached Black Lake. Excavated soil disposed of and replaced. Line repaired. No notice of violation.
1999	On Site - Ultrasonic testing access inspection pit	8400	A 200-barrel crude oil release was discovered around an under-ground inspection pit. An ultrasonic testing access inspection pit for north & south crude oil headers had filled with oil and over-flowed. The 200 barrels was recovered/ Piping will be replaced with heavier gauge. No notice of violation.
2000	Frac Tank Cavern 106.	4200	Frac tank overfilled and flowed over into dike containment of cavern 106. Tank emptied, oil replaced in cavern. Contaminated soil disposed of and replaced. Oil pools recovered and placed in slop oil system. No notice of violation.

Discharge Scenarios

Small or medium terrestrial spills occurring at the site proper (that is, from the tank farm, pig trap, manifold, and similar areas) would not ordinarily constitute sufficient volume to overcome containment, barriers, and gradient to migrate to offsite areas. The proximity of downgradient water and wildlife/sensitive area environments is within one mile for all discharge scenarios. Except for the worst case spill, these sensitive areas are not expected to be impacted for small and medium spills.

Cavern 6, located on the north side of the facility and the south shore of Black Lake, was selected for the worst case scenario. The southeast wind would spread oil from this cavern across the south shoreline and out into Black Lake. Surface drainage would tend to carry oil deposited on land out into Black Lake and the adjoining wetlands. The horizontal range of the spill would cover approximately 2,000 acres of Black Lake.

Site flooding was not used in scenario development since the West Hackberry site is not in a National Flood Insurance flood or hurricane high-hazard flood zone. The adverse weather conditions used for all spill discharge scenarios entailed high winds from the southeast and rain. Prevailing site winds in the winter are from the north or northwest and from the south or southeast in the summer. When winds exceed gale force, or hurricane conditions are imminent, outside activity at the SPR sites is ceased to protect personnel from injury. During such conditions spill response would not be feasible, because it would greatly exceed the safety envelope for responders.

Small and Medium Discharges

a. Small Discharge

The smallest-volume crude oil spill has been established at 2,100 gallons (50 bbls.) and would involve the failure of a flange gasket on the 30-inch pipeline on the discharge side

of the high pressure pump pad (HPPP). The HPPP was placed in service in 1989 and has been recently upgraded with replacement of piping and components. Life extension program improvements are ongoing and include adding two crude oil pumps and extending the concrete dike to surround the pad. The majority of the 50-bbl spill would be contained within the diked area with any excess channeled/directed to the retention pond where vacuum trucks would be used to recover the oil. There would be no offsite impact to sensitive environments, waterways, or wet lands from the postulated small case spill. In this scenario, there is no probability of a chain reaction causing secondary failures. The HPPP valves are remotely controlled from the site control room or may be manually isolated from the pad.
For a spill of this magnitude to occur from the HPPP, the site would have to be in the process of pressurizing system piping for either drawdown or fill procedures or for cycling equipment during operational testing. Weather conditions for this scenario involve heavy rains and high winds out of the southwest. In this scenario, weather conditions would not have a significant affect/impact on response efforts. Actual hurricane conditions are not assumed because operational protocol and past practice have been to institute a complete operational shutdown on approach of such conditions. Tornado conditions are not considered because such conditions are very transient and are not expected to substantially alter the impact of the small volume of oil discharged.

Field operators or other site personnel would most likely identify this spill since oil would violently erupt from the ground adjacent to the HPPP. Control room panels would indicate an upset condition (either through pump overspeed and/or pressure transients). Response efforts would be minimally delayed if the control room could not remotely operate HPPP valves and the field crew had to manually initiate closure. The immediate accident mitigation and spill response sequence for this scenario would, generally, be as follows:

- Immediate initiation of ESD procedures involving cessation of pumping activities and closure is isolation block valves.
- Initiation of the site-wide warning system.
- Dispatching ERT personnel to the scene to conduct initial on-scene accident assessments and to establish an exclusion area based on field measurements and visual observations of the spill.
- Activation of the West Hackberry incident command organization (ICS).
- Activation of the IC/QI (ECC) command post.
- Notifying offsite authorities and initiating SPR inter-organizational notifications.
- Activating at least one TIER 1 OSRO.

This scenario does not address causation of the equipment failure.

See Section 5 for a general description of the functional response duties of emergency responders and the sequence in which they would be performed.

Onsite cleanup would consist of the return of collected product to storage (following approval by the crude oil quality group) and the physical cleanup and disposal of generated wastes by means of a private waste disposal contractor. Waste disposal would be accomplished under contract to licensed waste disposal companies following characterization of the material as a hazardous or nonhazardous waste.
Event closeout would follow investigation of root cause and application of corrective actions or implementation of a schedule of corrective actions with the approval of the cognizant governing authorities and/or agencies.

b. Medium Discharge

This scenario postulates a low-pressure release from Cavern 106 during a wellhead workover following cavern depressurization and the premature removal of a high pressure blow out preventer. The cavern pressure is observed to be at zero (atmospheric) pressure and the pressure accumulator is removed.

Well 106A is generally referred to as Well 106. Well 106A was drilled as a replacement to Well 106 which was lost due to drilling problems.

Well 106A also experienced drilling problems. Either during cement pumping or while drilling out of cement after the setting of the 20" OD casing, the bottom two joints of the 20" casing fell to the 2,858' depth level (the depth to which the 17-1/2" diameter borehole had been previously opened to a 22" diameter). A sonar survey was run on October 10, 1983. After considerable effort and several different approaches, it was finally possible to drop a fish to the bottom of the well by leaching. This was completed in November 1983.

On August 24, 1984, the well was plugged due to a site power outage. The well was worked over and sonared on October 1, 1984. The 10-3/4" tubing was cut at 4,455' on June 21, 1985. The First Reverse Leach Stage was completed in August 1985. Approximately 0.6 million barrels of oil were injected on October 12, 1985, at the start of the Second Reverse Leach Stage.

On May 1, 1986, the 10-3/4" tubing was parted at 2,952' due to an apparent salt fall. A total of 1,030' of tubing was lost. The 10-3/4" tubing was replaced and the well put back in service.

The cavern completed leach on November 2, 1987, with a calculated cavern volume of 12.1 MMB. The final configuration workover was completed in 1990. Cavern 106 is fully functional and in excellent working condition.

Weather conditions for this scenario involve heavy rains and high winds out of the Southeast. In this scenario, weather conditions would have a minimal affect/impact on response efforts. Actual hurricane conditions are not assumed because operational protocol and past practice have been to institute a complete operational shutdown on approach of such conditions. Tornado conditions are not considered because such conditions are very transient and are not expected to substantially alter the impact of oil discharged.

The workover crew observes a release from the cavern and initiates actions to close the wellhead. The release results in about 1,200 bbls. (50,400 gallons) of oil spilled to the well pad containment area. There is no aerosol release associated with the spill. The

spill volume horizontal range would be limited to containment within the secondary dike, with no probability for a chain reaction in secondary systems.

In abbreviated form, the response to this type of spill would consist of the following:

- Notification and callout of the site incident command organization
- Activation of the IC/QI command post (ECC)
- Notifying offsite authorities and initiating SPR inter-organizational notifications
- Activating at least one TIER 1 OSRO
- Coordination of initial organizational response activities of the SPR with those of local response organizations (local law enforcement, fire and rescue, LEPC coordinator, and similar groups)
- Spill containment/confinement (contained by well pad secondary containment)
- Product recovery and establishment of, or arrangements made for, temporary storage
- Cleanup of onsite areas by OSROs under contract
- Cleanup of affected offsite public and/or private properties (coordinated with state and local government agencies and involved private landowners).
- Collection and disposal of generated wastes (accomplished under contract to licensed waste disposal companies following characterization of the waste as “hazardous material” or “oilfield” waste).

See section 6 for a general description of the functional response duties of emergency responders and the sequence in which they would be performed.

On-duty personnel will initially respond. Off-duty members will rapidly augment their response as they arrive at the facility staging area in response to emergency callout. Personnel and equipment from other SPR facilities would augment site personnel to assist with response. OSROs will be quickly notified and requested to respond. Field monitoring equipment will provide data that to be used as a basis for establishing the exclusion zone perimeter. This data, in conjunction with product knowledge, will be used to identify appropriate protective equipment necessary to participate in response and cleanup. Vacuum trucks and portable pumps will be used to recover product and transfer it to temporary storage pending sampling, analysis, and final disposition.

Worst Case Discharge

Nearly all of the oil stored at West Hackberry is in 22 underground storage caverns in the underlying salt dome formation. Each of these storage caverns is of similar construction, with individual storage capacity ranging from approximately 8.5 to 13.4 million barrels of oil. Oil is stored under similar pressure in each of these caverns.

The worst case discharge at West Hackberry would involve a surface release of oil from Cavern 6 to the extent that the oil storage pressure is reduced to zero at the surface. Such a release from West Hackberry Cavern 6 has been calculated to be 75,000 barrels or about 3,150,000 gallons. For the purposes of this worst case scenario, the existing secondary containment of 101,000 barrels capacity at this cavern is assumed to fail, resulting in a total release of 75,000 barrels of crude oil to the environment. A worst case failure would simultaneously involve all three of the wellheads for the cavern, since failure of only one wellhead would allow operational mitigation of the release magnitude. Note that the potential volume of a single cavern release is over 10 times the approximately 7,225 barrels of combined aboveground oil and fuel storage at the West Hackberry facility.

Cavern 6 is shaped like a shallow bowl, with a maximum diameter of about 1,200' and a depth of 158'. Cavern 6 is a three-well cavern entered by Wells 6, 6B and 6C. A fourth well, Well 6A, drilled to a depth of 2,240', penetrated the salt but not the cavern. The well was abandoned after a major fire in September 1978. During a workover of Well 6 on September 21, 1978, a blowout and fire occurred and an estimated 72,000 barrels of crude was lost. After recertification was completed in late 1980, the cavern was placed back into operation.

Well 6 was converted to oil service by cementing a 9-5/8" liner to 2603' inside the original 12-3/4" production casing set at 2,632'. In a workover during cavern recertification, 7" casing was cemented to a depth of 2,743'. Sonar surveys were run in Well 6C on September 17, 1979; in Well 6B on September 18, 1979, and March 21, 1980; and in Well 6 on May 21, 1980. Wellhead leaks were repaired in Well 6B on September 3, 1986; in Well 6 on September 10, 1986; and in Well 6C on September 15, 1986.

A cavern integrity test was completed July 1987 which showed Wells 6 and 6B to possess mechanical integrity. Well 6C was retested in FY88 after the wellhead leaks had been repaired and cemented casing leaks were detected. A liner was cemented in the well in May 1990. Cavern 6 is fully functional and in excellent working condition.

Weather conditions for this worst case scenario involve heavy rains and high winds out of the southeast. Actual hurricane conditions are not assumed because operational protocol and past practice has been a complete operational shutdown on approach of such conditions. Tornado conditions are not considered because such conditions are very transient and not expected to substantially alter the impact of such a large release.

Cavern 6, located on the north side of the facility and the south shore of Black Lake was selected for the worst case scenario. This cavern would produce the largest volume of oil loss on complete failure. The southeast wind would spread oil from this cavern across the south shoreline and out into Black Lake. Surface drainage would tend to carry oil deposited on land out into Black Lake and the adjoining wetlands.

Worst Case Discharge Response

Catastrophic failure of the three Cavern 6 wellheads is expected to be rapidly identified by field operators and instrumentation. It will quickly become apparent that there is no readily available means of stopping the release of oil prior to complete depressurizing of the storage cavern. The southeast wind will carry the aerosol plume, resulting from the pressurized release of oil, off of the facility and away from operational activities. Operational response will be to secure all potential ignition sources in the area, ensure that Cavern 6 is effectively isolated from the other storage caverns and oil systems, and evacuate all personnel from the area of potential exposure. AMOCO, which has several pumping oil platforms located in Black Lake about 4,300

feet down range of the spill source, will be immediately notified so that they may take action to secure their equipment.

Oil released from complete depressurizing of Cavern 6 will require a tiered response of all internal response team resources and OSRO contractors. The on-duty emergency response team will make initial response. Off-duty members will augment their response as they arrive at the facility staging area in response to their emergency callout. Supplementary response personnel and equipment will likely be dispatched from nearby facilities to assist in the response. Multiple OSROs will be quickly notified and requested to respond as quickly as possible for a spill in a brackish lake and marsh area. Although not immediately likely, the response contractors will be advised of the potential for oil to move into local canals and the high traffic ICW, given inadequate containment and sufficient time.

The 75,000-barrel release may occur over 2 to 6 hours, dependent on the configuration of the break. The release is assumed to be two-phased, with about 75 percent of the oil becoming airborne and being transported downwind up to 2,000 feet, based on SPR experience with similar releases at its facilities. Airborne oil is projected to be deposited over a 90-degree arc in a northwest direction from the source. Oil is assumed to be deposited at average depths of 5.4 inches within 500 feet of the source (15,700 barrels), 2 inches between 500 and 1,000 feet of the source (17,500 barrels), and 0.6 inches between 1,000 and 2,000 feet of the source (21,000 barrels). An additional 20,800 barrels of oil will flow from the severed wellheads directly on the ground at the spill source. Approximately 30 percent of the oil released will evaporate and oil deposited directly on land (about 22 acres) will percolate about an inch in the soil (30 percent porosity) where it will become bound and biodegrade. Considering these factors about 24,700, 3,300, and 20,100 barrels of initially recoverable oil will be released to the land, to the water confined behind the erosion control structure, and to the open water of Black Lake. See section 12 for a facility map showing the location of Cavern 6, the spill source, the facility features, and a map of the area showing major features near the impacted area.

On leaving the facility, most of the oil will spread out into over 2,000 acres of lake and surrounding marsh, driven predominantly by wind. About 60 percent of the oil will be initially deposited and trapped behind the erosion control levee on SPR wetland and upland areas. Small circulation openings about 2,100 feet west and 500 feet east of the spill source, however, provide routes for some of this oil to escape the natural containment of the erosion control levee. Containment boom stored in the vicinity of these openings could be deployed to isolate this oil in the event of such an uncontrolled release. Once outside of the erosion control levee, oil will flow out into the lake with oil aerosol carried by the wind. The oil is expected to spread over a portion of this area moving against shoreline and marsh, where it will accumulate in naturally confining areas, detritus, and vegetation.

Assuming 5 percent of the oil behind the erosion levee is lost before boom is deployed, the average depth of oil on the 30 acres of impacted area behind the levee would be about 2.3 inches, or about 1.4 inches after loss to evaporation and percolation are considered. This oil would be effectively contained; however, it will present access problems in that area of the facility. Assuming the remaining oil were to spread over about 3,000 acres of lake and marsh under the effect of wind and runoff, the oil would achieve an average thickness of about one one-hundredth of an inch.

Response to this release will consist of securing the impact zone from ignition sources, assessing fire hazards and health risks, establishing an exclusion zone perimeter, identifying appropriate protective equipment necessary to enter the exclusion zone, providing public safety

by notifying neighbors and public safety officials, controlling access to the exclusion zone, minimizing spread of oil by initially taking advantage of natural containment of the erosion control levee and adding additional containment as appropriate, initiating free product recovery to remove this material from the oil contamination budget, and establishing cleanup strategies consistent with goals for termination. Field monitoring equipment will provide data to be used as a basis for establishing the exclusion zone perimeter. This data, in conjunction with product knowledge, will be used to identify appropriate protective equipment necessary to participate in response and cleanup. Initial containment efforts will consist of deploying boom at the erosion control levee openings, deploying boom to trap as much oil as feasible against the south shoreline, and constructing containment basins to provide an area into which to channel product for recovery. Both mechanical and hand excavation techniques will be used. These initial containment efforts are intended to limit the rapid spread of oil in this sensitive wetland, which will be unavoidably impacted by such a scenario. Recovery of product will be accomplished by use of vacuum trucks and portable pumps.

Final cleanup will involve discussions and concurrence with state and federal regulators and the landowners. Termination of cleanup activities may be graded to the types of areas impacted, with biodegradation of residue in some areas considered appropriate and complete removal of contaminated soil and debris in other areas.

Initial Response by Onsite Personnel

Catastrophic failure of the three cavern wellheads would be rapidly identified by Operations. For this type of failure, there is no effective accident mitigation technique that could be applied safely; the release would continue to complete depressurization of the storage cavern. Operational response will be to secure all potential ignition sources in the area and to ensure that the cavern is effectively isolated from the valving lineups of other storage caverns and oil systems.

Initial response will be made by on-duty personnel. Initial containment efforts will focus on isolating site drainage from outfalls to areas beyond the site boundary. This activity would consist of closing drainage ditch weirs, altering site drainage valve lineups, damming ditches, and similar functions. The culverts under the flood protection levee are key points for retention of oil. If action is undertaken quickly to isolate this release point, more than half of the oil can be retained in this area, where recovery efforts can be readily undertaken and little risk of further spread of oil exists. Activity associated with direct spill response efforts near the scene of the accident would not be permitted until completion of assessment of near-scene conditions by the on-duty ERT. This would be carried out by trained personnel equipped with appropriate protective gear and clothing (such as self-contained breathing apparatus and turnout gear).

During a worst case discharge, the facility ERT will be activated. The Incident Commander/Qualified Individual (IC/QI) will activate the ERT, based on information received from the control room operator. The need for additional resources will be determined by the IC/QI and ICS Operations Section Chief based on information obtained from the response team, the discoverer, or other sources of knowledge. This worst case scenario will require little information beyond its magnitude and location to determine that supplementary resources such as contract OSROs and other SPR emergency response teams are necessary.

In responding to this worst case discharge, which is clearly beyond the capability of the facility's Incident Command structure, ERT personnel, equipment, and available resources will be used where most effective until adequate resources arrive. The first action for the ICS Operations Section Chief and the ERT is to determine the extent of the exclusion zone. This is the area

where access is limited to trained emergency responders and qualified support personnel and specialists. For purposes of this scenario, the exclusion zone boundaries will change as the spill spreads, until containment can be achieved. The ICS Operations Section Chief controls access to the exclusion zone through his response team personnel.

The response team and operational personnel must next determine if any action can be taken to stop or reduce the discharge at its source. Many SPR systems may be controlled or isolated remotely, or the response team may assist in isolation of the spill at its source by operating equipment such as valves.

Evaluation of the released product, its likely path, sensitive impact areas, reasonable containment points, and protective countermeasures are undertaken to provide an effective interim response, beyond isolation of the source, until additional resources arrive. This action is critical and relies heavily on the judgment of the IC/QI and the ICS Operations Section Chief and their specialist employees. In this case, resource limitations require a focus on protection of sensitive resources by limiting the spread of oil, and a limited attempt at containment of spilled product. The openings through intermediate levees and the hurricane protection levee are key points for retention of oil. If this action is undertaken quickly, the amount of sensitive area impacted may be reduced by several magnitudes. The next action by the response team will be to use boom to trap as much oil as feasible. This action will limit the amount of oil contaminating the wetland system and make it readily available for recovery. The key goal in this interim response is to make maximum use of available resources in controlling the spill.

West Hackberry will receive some interim resource support from another SPR facility, such as Big Hill, located about 100 miles to the southwest, and other facilities to the east. Interim support would include both equipment and personnel. All of the emergency response teams train with one another, facilitating cross-facility support. The interim support will be incorporated into the existing West Hackberry Incident Command Structure as it arrives. These personnel will be appropriately briefed on the hazards and necessary protective measures in accordance with Title 29 CFR 1910.120(q) prior to their entry into the exclusion zone. This interim support will continue until adequate response contractor resources arrive and are deployed.

First Seven Days

Sufficient numbers and type of trained personnel are available to continue operation of the equipment and staff for the first 7 days of a worst case spill. The response will vary with the location and type of spill. For purposes of this section, a spill in a remote wetland area is assumed and is applicable to each response zone.

Trained Personnel Necessary For First Seven Days

General Positions	* Number before OSRO	* Number after OSRO
SPR EMERGENCY RESPONDERS		
Incident Commander	1	1
Response Team Leaders	4	5
Response Team Members	40	5
Specialist Employees	4	8
Skilled Support Employees	12	6
Communication Specialists	2	2
OIL SPILL RESPONSE ORGANIZATION		
OSRO Field Managers	NA	5
OSRO Field Supervisors	NA	30
OSRO Equipment Operators	NA	20
OSRO Support Personnel	NA	10
OSRO Laborers	NA	300
Surveillance Pilots	NA	3
SPR SPILL MANAGEMENT TEAM AND SUPPORT TEAMS		
Emergency Manager	1	1
SPR Emergency Management Team	6	6
Emergency Operations Support Team	14	14
Qualified Individual	4	4
Spill Manager	3	3
Spill Management Support Team	30	30

* Numbers before OSRO indicate the number of people initially responding to the event. Numbers after OSRO represent the total number of personnel directly associated with the spill response or spill response support functions. This transition will probably occur during the first two days of the event.

Any required excavation work will continue around the clock until pipelines are exposed. Emergency responders will continue mitigation efforts around the clock initially until the discharge is successfully contained or confined, if it is possible to do so safely. Thereafter, response activities will be carried out primarily during daylight hours for safety and efficiency considerations. A skeleton crew will be maintained at the scene to monitor effectiveness of containment throughout each night. Should containment degrade during the night, the skeleton crew will take corrective action within its capabilities, and notify the Incident Commander for direction on appropriate action.

SPR Response Contractor Role

In this worst case discharge all OSROs are notified immediately with the intent of them providing the necessary resources to assume the spill response and cleanup operation from the SPR response team. The SPR will continue to closely manage the contract OSROs throughout the spill response and cleanup.

SPR Spill Management Team Role

While the response actions cited in the previous subsections are underway, the SPR EOC located in New Orleans will coordinate the notification of the Emergency Management Team and the activation of the New Orleans Incident Command Organization. The personnel assigned to the New Orleans Incident Command Organization will provide technical support to the IC/QI as well as ensure planing, logistics, and finance effort. Further, personnel who have preassigned to ICS positions and the communications van will be dispatched to the site to provide on-scene support to the IC/QI.

Substantial Threat of Worst Case Discharge Prevention

The SPR program to prevent and deal with the substantial threat of a worst case discharge is a combination of procedural safeguards and process hazard analysis. The procedural safeguards may be thought of as a set of concentric circles, providing redundant preventive measures. At the center is the process or operation itself, surrounded by Operating Procedures, Upset Response Procedures, Emergency Response Procedures, and Facility Response Plans as the final ring. These procedures all rely on trained personnel, communications, and fixed/mobile equipment.

The first line of defense in preventing discharges is the qualified operator trained in and following the operations procedures. It is the role of the upset response manual to assist trained personnel (operators) in recognizing upsets and in taking steps to prevent the upset from happening or becoming an emergency or at least minimizing the consequences of a discharge. Most upsets addressed in the SPR site upset response manual are spill related. It is the goal of the manual to help the operator to identify spill conditions (upsets) by recognizing the cues (instrumentation alarms and indications) and to take actions to prevent it or minimize the amount of fluid spilled. After the operator has done all he could to limit or control the upset, the upset response manual refers him to the next level of action, which is the activation of the site Emergency Response Team (ERT) and the emergency response procedures associated with that action.

The SPR Process Hazards Analysis Program is designed to surface hazard and discharge potentials through a clearly defined process, and determine safeguards to prevent or mitigate substantial threats of worst chase discharges.

The Strategic Petroleum Reserve of the U.S. Department of Energy (DOE) in 1994 received a ruling from OSHA that Process Safety Management 29 CFR 1910.119 applied to its sites, and the required conduct of Process Hazard Analyses for each site began that same year. Process Hazard Analysis (PHA) provides analyses for existing and new systems of “process safety” significance. Features, which are common to all Process Hazard Analyses (PHAs), performed to OSHA standards, are:

- The identification of any previous incident, which had a likely potential for catastrophic consequences in the work, place.
- Facility siting considerations
- Human factors considerations.

The SPR has selected the HAZOP methodology to perform Process Hazard Analyses. A key objective of these analyses is to pool the collective thinking of the teams to identify new hazards, substantial discharge threats or operating problems. Hazards are defined as scenarios, which result in risks to personnel (including the public), the environment and

equipment. Operating problems are defined as scenarios, which do not necessarily involve risks, but which may result in the delay of operations, including drawdown.

The HAZOP methodology is a node by node review of the operating parameters (primarily flow, pressure, temperature) using guide words (e.g. more, less, no) to define deviations which may result in a hazardous condition (i.e. scenario). The methodology then considers existing safeguards to prevent or mitigate the harmful consequences and determine risks . Based on the consequences and existing safeguards, the team may develop recommendations to reduce the risk or improve operability. The HAZOP technique utilized is a classical line-by-line, system-by-system procedure using a "guide word" approach that provides a rigorous structure to the HAZOP analysis procedure

The guideword approach uses the following logic.

- From the P&ID a small section (node) is identified to be studied.
- The discussion among team members follows.
- The discussion focuses on a "parameter", "guide word" and "deviation" (e.g. "no" - "no flow") to identify the "causes", "consequences", and "safeguards."
- The discussion results are documented.
- "Recommendations" are developed and documented for those "consequences" which do not have adequate "safeguards".
- This process is repeated for other "guide words" and "deviations" until the "node" is fully analyzed.

The PHA Team includes a Pipeline Technical Representative, who is typically a senior member of the Pipeline Maintenance Crew. His presence is required during team discussions of pipeline operations.

The following is an example of the PHA Team's analysis for a pipeline:

Causes: 2.1. Pipeline damaged by construction, marine crossings; corrosion; sabotage; less than adequate repairs; no or wrong inhibitor.

Cause category: CO

Consequences: 2.1.1. Delay in operations; offsite oil spill (including urban areas, farmland, creeks, bayous, river, wetlands and harbor), long term undetected leak.

Consequence category: E

- *Safeguards: 2.1.1.1. Pipeline surveillance (land & boat & air).*
- *Safeguards: 2.1.1.2. Flowmeter*
- *Safeguards: 2.1.1.3. Facility Response Plan for Offsite Pipelines and State Oil spill prevention and response Plan, and Site Oil Spill Contingency Plan*
- *Safeguards: 2.1.1.4. Upset response Plan*
- *Safeguards: 2.1.1.5. Pipeline crossing signs*
- *Safeguards: 2.1.1.6. Corp Of Engineers Permits required for dredging near SPR pipelines.*

- *Safeguards: 2.1.1.7. TESS/DOTTIE notification intent to dig*
- *Safeguards: 2.1.1.8. Smart pigs*
- *Safeguards: 2.1.1.9. Quality Control of pipeline repairs*
- *Safeguards: 2.1.1.10. SPR Pipeline Handbook (including procedures on pipeline inhibitors).*
- *Safeguards: 2.1.1.11. Purchase Request review of inhibitor chemicals by ES&H.*
- *Safeguards: 2.1.1.12. Cathodic protection (impressed current) & monitoring.*
  - *Severity before recom.: 2*
  - *Likelihood before recom.: 3*
  - *Risk before recom.: 6*
  - *Recommendations: 2.1.1.1. *None*
    - *Remarks: 2.1.1.1.1. *None*
    - *Severity after recom.: 2*
    - *Likelihood after recom.: 3*
    - *Risk after recom.: 6*
    - *Recommendation priority: 2*
    - *Recommendation status: 0*

Discharge Detection
Operations and security staff man each SPR facility 24 hours per day, 365 days per year. When a system, subsystem, or pipeline is in operation, several precautions are taken to ensure prompt detection of leaks. During crude oil transfer, operations pressure and flow are monitored on both ends of the pipeline. Operators at both ends of the pipeline are in constant communication so that data anomalies may be immediately reconciled.

Visual observation is another technique for identification of small leaks, activities that might cause leaks, or location of leaks indicated by pressure anomalies. Periodic inspection of onsite and offsite system piping and pipelines is conducted to observe conditions on and adjacent to the pipeline right-of-way, and highway, river, and railroad crossings, and to detect evidence of leaks, geophysical activity, oil theft, sabotage, construction by other, and any other factor affecting the safety and operation of the pipeline. Physical inspections of water crossings are conducted at least every 5 years to ensue that the pipeline does not become exposed due to washout, and similar factors. Water crossing inspections may include use of divers and probes.

Initial detection of a leak might by visual means. Aerial patrols are conducted every 2 weeks, weather permitting, but not exceeding a 3-week interval. Land patrols, consisting of walking or driving the right-of-way, are made at least every 2 weeks when aerial patrols cannot be conducted, and when maintenance functions are being performed. Visual detection of a leak might be by a member of the public. The ownership of SPR pipelines is clearly identified at road and water crossings, where an emergency notification phone number is posted.

Discharge Detection by Onsite Personnel

a. Emergency Action Checklists
Emergency Action Checklists are issued to all employees who might encounter a spill. The checklist is designed to be attached to the site access badge, which is required to be worn at all times while on the site, and describes in an abbreviated form the actions the discoverer of a spill should take. Those actions are to call the control room operator and provide the following information:

- Advise of the presence and extent of injuries.
- Identify the type of material released.
- Give the location of the release.
- Specify the source of the leak.
- Provide the approximate size of the spill in volume, area affected, or other available means.
- Estimate any apparent damage.
- Describe immediate pending weather conditions.
- State the direction the spill is moving and any immediate areas of expected impact.
- Explain the types of access to the area including terrain and waterways.
- Discuss other threats such as potential fire and impact to onsite or offsite property and environmentally sensitive areas such as rookeries and nurseries.

Note: The discoverer is further advised not to endanger himself and to stay available in the event that further questions or help are required.

b. Discharge Detection During Normal Facility Operations
The normal mode for the facility is a “readiness” mode in which system pressures, tank levels, valve positions and alignments, manifold sequences, and similar systems are within more or less fixed positions or conditions which are not subject to change. Onsite system transients which result in an alteration of the nominal operational parameters referenced above are immediately detected either via control panel alarm and annunciation or are observed directly by site personnel. Any alteration in this “normal readiness” mode of operation, such as that required when cycling valves or exercising pumps, normally requires the presence of field operators to observe the activity and record readings and values.

Automated Discharge Detection
Initial detection of a leak during system or equipment operation would be expected to be by a pressure or flow deviation. Observed anomalies in data can be immediately compared to throttling or pumping activities via communicate between the control room and field operators. Unexplained deviations are immediately investigated and shutdown ordered if a leak is

indicated. Pressures are also monitored when systems are in a static or standby mode, as an indication of overall system integrity. Any unexpected/unexplained loss of pressure is immediately investigated by field operators onsite and by aerial and ground level observation patrols for offsite pipeline anomalies. If a spill/discharge is observed, then response actions described in section 5 are undertaken.

Beyond system pressure, valve position indication, and tank and sump level sensors, no installed discharge detection mechanisms exist. As stated above, transients representing a departure from normal operating thresholds imply an abnormal condition. The control room dispatches operations personnel to the apparent scene of such anomalies to conduct on-scene assessments and report back to the control room. Planned departures from the readiness mode incorporate higher levels of spill response readiness because additional personnel are included in the transition from readiness to full system operation.

Containment and Drainage Planning
See attachment 26-1, which follows.

ATTACHMENT 26-1

EXCERPTED FROM SECTIONS 3 AND 4 OF THE SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN: WEST HACKBERRY, WHL5400.20

The following material is excerpted from section 3 of the Spill Prevention, Control, and Countermeasures Plan: West Hackberry, WHL5400.20.

Table 3-1 (Sheet 1 of 6). Onsite Potential Spill Sources and Estimated Quantities

FACILITY DRAINAGE			
Map ID No.*	Source	Probable Worst-Case Spill Quantity** (in barrels)	Substance
1	Oil/water separator at cavern 6		Crude Oil
2	Oil/water separator at cavern 7		
3	Oil/water separator at cavern 8	76	
4	Oil/water separator at cavern 9		
5	Oil/water separator at cavern 11		
6	Oil/water separator at cavern 101		
7	Oil/water separator at cavern 102		
8	Oil/water separator at cavern 103		
9	Oil/water separator at cavern 104		
10	Oil/water separator at cavern 105		
11	Oil/water separator at cavern 106	45	
12	Oil/water separator at cavern 107		
13	Oil/water separator at cavern 108		
14	Oil/water separator at cavern 109		
15	Oil/water separator at cavern 110		
16	Oil/water separator at cavern 111		

* Refers to figure 3-1.

** Represents container capacity.

Table 3-1 (Sheet 2 of 6). Onsite Potential Spill Sources and Estimated Quantities

FACILITY DRAINAGE			
Map ID No.*	Source	Probable Worst-Case Spill Quantity** (in barrels)	Substance
17	Oil/water separator at cavern 112	45	Crude oil
18	Oil/water separator at cavern 113		
19	Oil/water separator at cavern 114		
20	Oil/water separator at cavern 115		
21	Oil/water separator at cavern 116		
22	Oil/water separator at cavern 117		
23	Oil/water separator at high-pressure pump pad	48	
24	North retention pond	300	Storm water/ Aqueous Film Forming Foam (AFFF)/ Crude Oil
25	East retention pond	300	

* Refers to figure 3-1.

** Represents container capacity.

Table 3-1 (Sheet 3 of 6). Onsite Potential Spill Sources and Estimated Quantities

BULK STORAGE TANKS			
Map ID No.*	Source	Probable Worst-Case Spill Quantity** (in barrels)	Substance
26 ***	Slop oil tank	7,000	Crude oil
28	Diesel tank at raw water fire water pump	7	Diesel
29	Emergency generator diesel tank	48	
30	Diesel tank for fueling site vehicles	48	
31	Two raw water intake structure transformers	21	Mineral Oil
32	Gasoline tank for fueling site vehicles	119	Gasoline

* Refers to figure 3-1.

** Represents container capacity.

*** Refer to 4.2.1

Table 3-1 (Sheet 4 of 6). Onsite Potential Spill Sources and Estimated Quantities

PIPELINE SYSTEM			
Map ID No.*	Source	Probable Worst-Case Spill quantity (in barrels)	Substance
33	High-pressure pump pad and sump	300	Crude oil
34	Meter station and prover	300	
35	Pig trap	1400	
36	Outside manifold northeast of cavern pad 9	347***	
37	Outside manifold west of cavern pad 8	347***	
38	Outside manifold north of cavern pad 11	347***	
39	Crude Oil Heat Exchangers	764***	
40	Crude Oil Degassing Unit	520***	

* Refers to figure 3-1.

** Represents container capacity.

*** Based on a 5-minute flow rate

Table 3-1 (Sheet 5 of 6). Onsite Potential Spill Sources and Estimated Quantities

Miscellaneous			
Map ID No.*	Source	Probable Worst-Case Spill Quantity** (in gallons)	Hazardous Material/ Hazardous Waste
41	Flammable storage building	5 1	Petroleum Products Paint
42	Lab satellite	1	Hazardous Waste
43	Central Waste Accumulation Area	55	

* Refers to figure 3-1
** Assigned a value of 2,000 barrels as explained in subsection 3.1

Table 3-1 (Sheet 6 of 6). Onsite Potential Spill Sources and Estimated Quantities

POTENTIAL CAVERN CRUDE OIL RELEASE * (in thousand barrels)			
Cavern No.	Cavern Oil Volume	Well Pad Volume	Oil Released From Cavern
6	7,000	101	40
7	12,300	125	70
8	9,900	52	56
9	9,200	62	52
11	8,200	42	47
101	10,300	36	64
102	10,200	35	63
103	9,600	36	59
104	10,500	35	66
105	9,800	35	61
106	10,200	36	63
107	11,000	36	69
108	10,700	36	66
109	10,600	36	66
110	10,300	41	64
111	9,500	41	59
112	10,500	36	66
113	11,200	41	70
114	10,300	36	64
115	10,100	36	63
116	10,300	36	64
117	11,200	36	69

* Should the volume of oil exceed the volume of containment, containment would be breached to direct flow to a temporary holding area. Location of the holding area would be adjacent to the wellpad. Weather conditions may affect selection.

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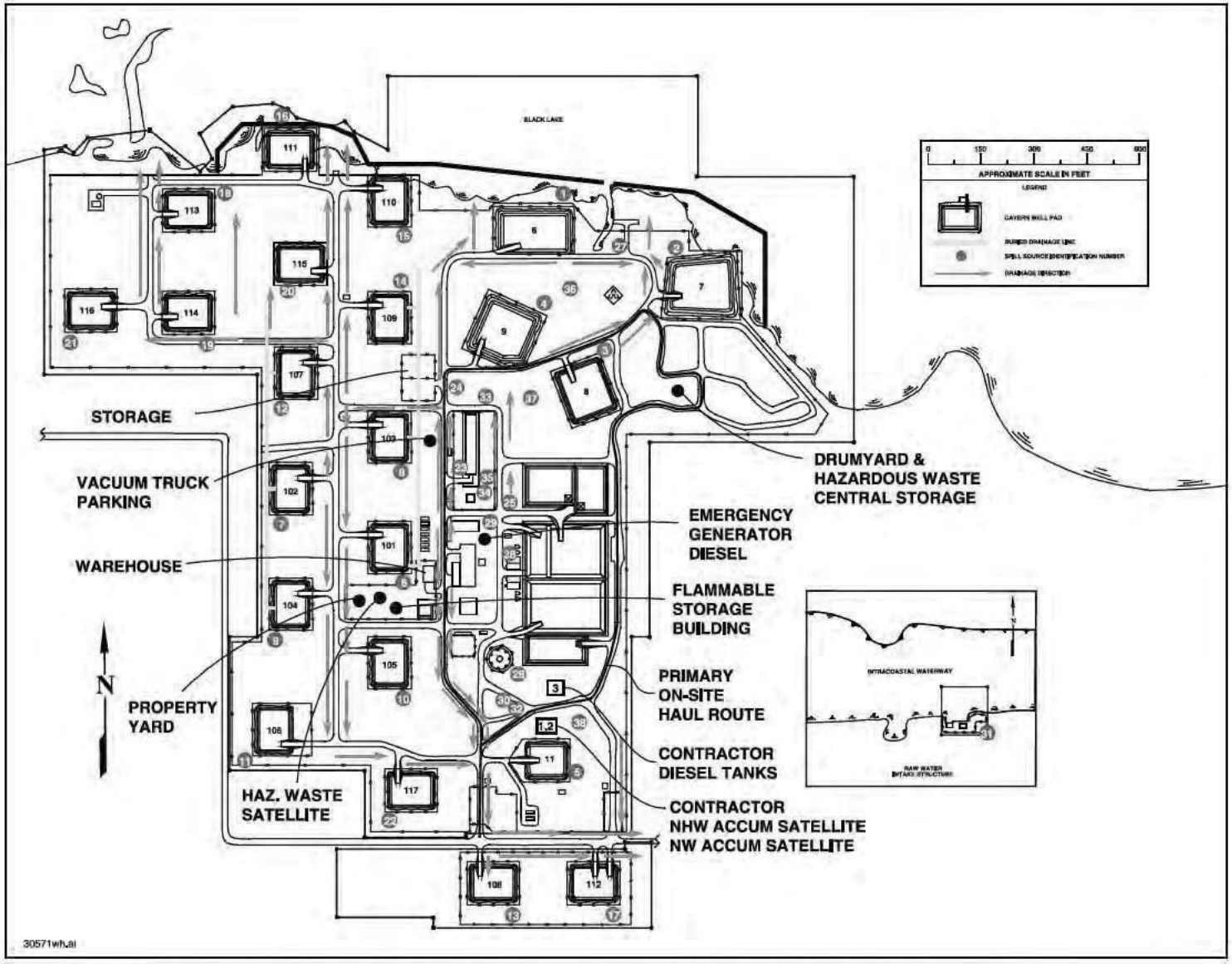

Figure 3-1. Potential Spill Sources and Flow Directions on the West Hackberry Site

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The following is from section 4 of WHL5400.20.

4. SPILL PREVENTION MEASURES AND CONTROL STRUCTURES AND EQUIPMENT

This section explains spill prevention measures, identifies each potential oil spill source, and describes the structures and equipment that would be used to contain a spill and prevent the pollution of nearby navigable waterways. Map identification numbers refer to figure 3-1 and table 3-1.

4.1 FACILITY DRAINAGE

Drainage of storm water from storage areas and cavern pads enclosed by dikes is a controlled process. On 17 cavern pads, storm water is directed through an oil/water separator on each pad and then into a sump. Storm water is then discharged by a manually activated pump, which is kept switched to the off position to prevent an inadvertent discharge. On five cavern pads, storm water is discharged by gravity through oil/water separators. Each cavern pad separator discharges directly to site drainage with the exception of caverns 101 and 103 and caverns 102, 104, and 107, which discharge into two buried drainage lines directed to site drainage and into Black Lake. Oil/water separators are discussed in paragraphs 4.1.1 and 4.1.2.

On the high-pressure pump pad, all storm water is normally directed to the north retention pond and east retention pond, pumped to an oil/water separator, and discharged into a ditch that drains into Black Lake. During a severe rain, storm water could flow through the open north end of the pad.

Storm water released to site ditches is analyzed for pollutants in accordance with the requirements of the United States Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System (NPDES) and the Louisiana Water Discharge Permit System (LWDPS). The NPDES permit (LA0053031) and LWDPS permit (WP-1892) are retained on site and effluent limitations are summarized in the M&O contractor's Environmental Programs and Procedures Manual. Results of these analyses, retained both at the site and in the M&O contractor's Environmental department in New Orleans, are forwarded to appropriate federal and state agencies.

Uncontained drainage on the north half of the site flows into Black Lake. Uncontained drainage on the south half flows to Parish Road 645 and eventually reaches Black Lake. The drainage system for areas without dikes has not been engineered to direct storm water flow into ponds, lagoons, or catchment basins designed to retain oil or return oil to the facility. Boom and earthen dams would be used to control a spill that reaches drainage ditches.

4.1.1 Oil/Water Separators at Caverns (Map ID Nos. 1-22)

A separator is located at each of the cavern pads, and the separators' contents are contained within the dikes surrounding each cavern pad. On those cavern pads where storm water is discharged by pump, site operating procedures require the power switch for the separator sump pump to remain in the off position inside the pump's motor control until storm water is discharged.

4.1.2 Oil/Water Separator and Sump at High-Pressure Pump Pad (Map ID No. 23)

No containment measures have been installed for this buried separator and sump. Boom and earthen dams would be used to control a spill or overflow.

4.1.3 North Retention Pond and East Retention Pond (Map ID Nos. 24 and 25)

These containments have been added to hold storm water runoff from the high-pressure pad and to collect firefighting foam and crude oil in the event of a release.

4.2 BULK STORAGE TANKS

All storage tanks at West Hackberry are above ground and are constructed of materials compatible with the substances they contain. The slop oil and various fuel tanks are the only bulk storage tanks at West Hackberry. No fail-safe systems to prevent or warn of an imminent spill have been installed on the tanks; therefore, the only means of discovering a spill is visual inspection by site personnel. All storage tanks are inspected regularly, results are recorded, and all visible leaks are repaired immediately. Specific bulk storage tanks are discussed in the following paragraphs.

4.2.1 Slop Oil Tank (Map ID No. 26)

A dike capable of containing a potential worst-case spill surrounds this 7,000-barrel tank. Currently, this tank will only receive oil in the event of an emergency.

4.2.2 Diesel Tanks (Map ID Nos. 27, 28, and 29, and 30)

One 6.5-barrel tank at the raw water fire water pump (map ID no. 28), one 47.6-barrel emergency generator tank southeast of the Motor Control Center (MCC) building (Map ID no. 29), and one fuel tank south of the slop oil tank (map ID no. 30), which is in a metal containment basin. All of these tanks are surrounded by dikes capable of containing their contents except for the fuel tank identified by map ID no. 30.

4.2.3 Raw Water Intake Structure Transformers (Map ID No. 31)

The two transformers are surrounded by a cement curbing that drains into a sump and discharges into the ICW. The sump discharge valve is chained and locked in the closed position. The sump is capable of containing the contents of one transformer.

4.2.4 Gasoline Tank (Map ID No. 32)

The site's only gasoline tank, a 119-barrel tank south of the slop oil tank (map ID no. 32), is in a metal containment basin that is capable of containing its contents.

4.3 PIPELINE SYSTEM

Aboveground pipelines on site are on pipe supports, which minimize abrasion and corrosion and allow for expansion and contraction. Buried pipelines have a protective coating that is applied either by the factory or in the field and have an impressed current cathodic protection system to protect against corrosion. Internal pipeline corrosion is controlled through the use of corrosion inhibitors and routine internal pipe cleaning.

When a section of buried pipeline is exposed for any reason, it is examined for deterioration. If deterioration is found, the pipe is either repaired or replaced.

When a pipeline is temporarily out of service or is in a standby mode for an extended period of time, the main line valves are closed and preventive maintenance is performed on both the pipeline and the valves. Because of the requirements for perpetual standby readiness in the SPR program, main line valves instead of blind flanges are used in the standby mode.

All aboveground valves and pipelines on site are inspected daily by Operations and Maintenance personnel. At that time, the general condition of items such as flange joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces is determined. Hydrostatic testing of the pipelines was performed when construction was completed, and additional hydrostatic and ultrasonic tests are made as the situation warrants.

There are no overhead or other piping configurations restricting general vehicular access to particular site areas and requiring warning signs. Aboveground piping in crude oil service is so labeled. Vehicular barriers protect crude oil pipelines where they come to the surface adjacent to the roadway. Surface crude oil piping in the vicinity of road crossings is installed below grade protecting against vehicular contact. The one exception being the Lake Charles Meter Station pipeline between the onsite pig trap (LCMS) and the property line on the east side of the site.

Spills from pipeline failures leaving the site would follow the ground contour of the site to Black Lake. Boom and earthen dams would be used for containment, depending on whether the spill was on water or land. Specific potential spill sources on the pipeline system are discussed in the following paragraphs.

4.3.1 High-Pressure Pump Pad (Map ID No. 33)

A 6-inch concrete curb surrounds the pump pad, except at its north end, which is open for vehicle access. The pad is sloped to drain into the north retention pond and east retention pond (map ID nos. 24 and 25). Boom and earthen dams would be used to control a spill or overflow beyond the pad.

4.3.2 Meter Station and Prover (Map ID No. 34)

The meter station and adjacent meter prover loop are contained within an earthen berm. An overflow from this area would travel into the east retention pond. Boom and earthen dams would be used to control a spill in this area.

4.3.3 Pig Trap (Map ID No. 35)

A 4-inch drain line connects a collection basin at the pig trap door to an underground sump where liquid is automatically pumped to the 7,000-barrel slop oil tank (map ID no. 26). An overflow of the pig trap basin would travel north toward Black Lake, and boom and earthen dams would be used to control the spill.

4.3.4 Outside Manifolds (Map ID Nos. 36, 37, and 38)

Three outside manifolds are on site: one northeast of cavern pad 9 (map ID no. 36), another west of cavern pad 8 (map ID no. 37), and a third north of cavern pad 11 (map ID no. 38). Because no containment measures have been installed for these manifolds, boom and earthen dams would be used to control a spill. Spills from the manifolds near caverns 8 and 9 would travel north toward Black Lake and spills from the manifold near cavern 11 would travel south and enter a ditch along Parish Road 645.

4.3.5 Crude Oil Heat Exchangers (Map ID No. 39)

There are six ASME-coded shell-and-tube crude oil heat exchangers divided into three sets. Each set has two banks of heat exchangers that have cement containment with an average curbing height of 16 inches. The purpose of the heat exchangers is to cool the oil leaving the site with the incoming raw water used to displace the oil from the caverns. These heat exchangers will not contain crude oil unless the West Hackberry facility is in drawdown mode. At that time, the valves for the containment will be in the closed position to contain any oil spill on the pad. The exchanger area has a concrete curb and sluice gates for primary containment. Spills from the exchangers that escape the primary containment would flow east, then north toward Black Lake or west, then south towards Parish Road 645; in both cases, flow would be in existing site ditches, and boom and earthen dams would be used to control a spill or overflow.

4.3.6 Crude Oil Degassing Unit (Map ID No. 40)

The degassing unit will be made up of reboilers, an incinerator, and an emergency flare. This unit is located on a containment pad that drains to a retention pond within the containment area. Any spills from the unit will gravity flow into the retention pond.

4.4 MISCELLANEOUS

The miscellaneous potential spill sources are primarily hazardous substances. Secondary containment is provided for these different sources and is described below.

4.4.1 Flammable Storage Building (Map ID No. 41)

All hazardous materials spilled in the flammable storage building are contained within the perimeter floor curb. The building is capable of containing the probable worst case spill.

4.4.2 Laboratory (Map ID No. 42)

A small laboratory is housed in the maintenance building on the main facility. Hazardous substances that are used in water and oil testing are regularly inventoried along with available spill equipment. Personnel are trained in spill prevention and mitigation.

4.4.3 Central Waste Accumulation Area (Map ID No. 43)

Central and satellite hazardous waste accumulation areas are located within a secure, fenced area east of Cavern 8. Secondary containment is provided by the use of “poly-pak” plastic enclosures. A spill containment kit is located in this area.

4.5 FACILITY TANK LOADING/UNLOADING AREA

The fuel storage tank areas at West Hackberry are completely enclosed by metal containment pans designed to contain the contents of each tank. Warning signs are posted on the fuel storage tanks. Incoming fuel trucks are inspected by the operators before departure to ensure that there is no leakage during transit.

4.6 OIL DRILLING AND WORKOVER FACILITIES

When used, mobile drilling and workover rigs are on well pads enclosed by dikes. All drilling rigs utilize blowout preventers that meet state regulatory requirements when working on caverns containing oil or entrained gas. Well workovers are performed with the cavern pressure at or near zero pounds per square inch (psi).

4.7 GOVERNMENT-FURNISHED EQUIPMENT (GFE) AND MATERIAL

As part of DOE’s commitment to provide equipment and material necessary to prevent oil and hazardous substances from reaching navigable waterways, pollution control equipment and material are kept on site at all times (Table 4-1). Expendable material is maintained at or above a minimum stock level.

Table 4-1. Oil Pollution Control Equipment and Materials

Approximate Quantity	Description
1	portable oil skimmers
1	26-foot crew boat with 150-horsepower diesel inboard engine
1	20-foot crew boat with 60-horsepower outboard motor
1	15-foot shallow draft boat with 30-horsepower outboard motor
1	80-barrel vacuum truck (rent also, if necessary)
3	boom trailer 7 feet high, 6 feet wide, and 8 feet long
1500 feet	open water, inflatable boom with 12-inch to 14-inch skirt
1500 feet	marsh boom with 6-inch skirt
1000 feet	mini boom with 4-inch skirt
4000 feet	river boom, solid, 6-inch float and 12-inch skirt
3	2-inch centrifugal gasoline pumps (rented as needed)
60 feet	suction hose for skimmers and pumps
50 feet	discharge hose for skimmers and pumps
1	portable gasoline generator
2	portable light sets with stands
34	22-pound anchors
8	shovels
3	sledge hammers
3	pitchforks
10	self-contained breathing apparatus
12 pr.	rubber boots - dielectric, steel toe
	Expendable Material
40 rolls	sorbent blanket
80 pieces	sorbent boom
3,000 feet*	polypropylene rope
12	slickers
10 pr.	chemical resistant gloves
10 packs	powdered latex gloves
2 cases	Tyvek white disposable overalls
2	drum repair kits
4	overpack drums
5	goggles
3	face shields
5	aprons (chemical resistant)

Document 2 (Item D)


JULY 1999
AUGUST 1999

WEST HACKBERRY

SPR CAVERN MONITORING RECORD

DATE: 6-29-99 to 6-30-99

CAVERN 104

Monitoring Range: 900 to 1040 psi (oil)

PRESSURES	TIME	PREV.	0600		1235		1800		0330	
WELL BR/RW		291	291		291		292		292	
WELL OIL		983	983		984		984		984	
WELL ANNULUS		18	18		19		19		18	
MANIFOLD OIL		0	0		0		0		0	
CRUDE OIL API / TEMP										
BR/RW SALINITY / TEMP										
WELL CELLAR LEVEL		1/4	1/4	Note:			1/4	Note:		
WELL PAD DIKE LEVEL		1	1				1			
DRAIN VALVE POSITION	Open / Close	Close	Open	Time	Closed	Time	Open	Time	Closed	Time
PSV's SECURED OPEN			☐ YES	☐ NO			☑ YES	☐ NO		
OPERATOR INITIAL'S		KM	KD		HB		MM		MM	
SUPERVISOR REVIEW			INIT. DA		TIME: 1520		INIT. BK		TIME: 2000/0420	

TIME:	OPERATOR'S LOG

LEGEND * = GAUGE 1 GUN READING | CELLAR LEVEL (E) (1/4) (1/2) (3/4) (F) Circle if cellar contains oil

CAVERN 101

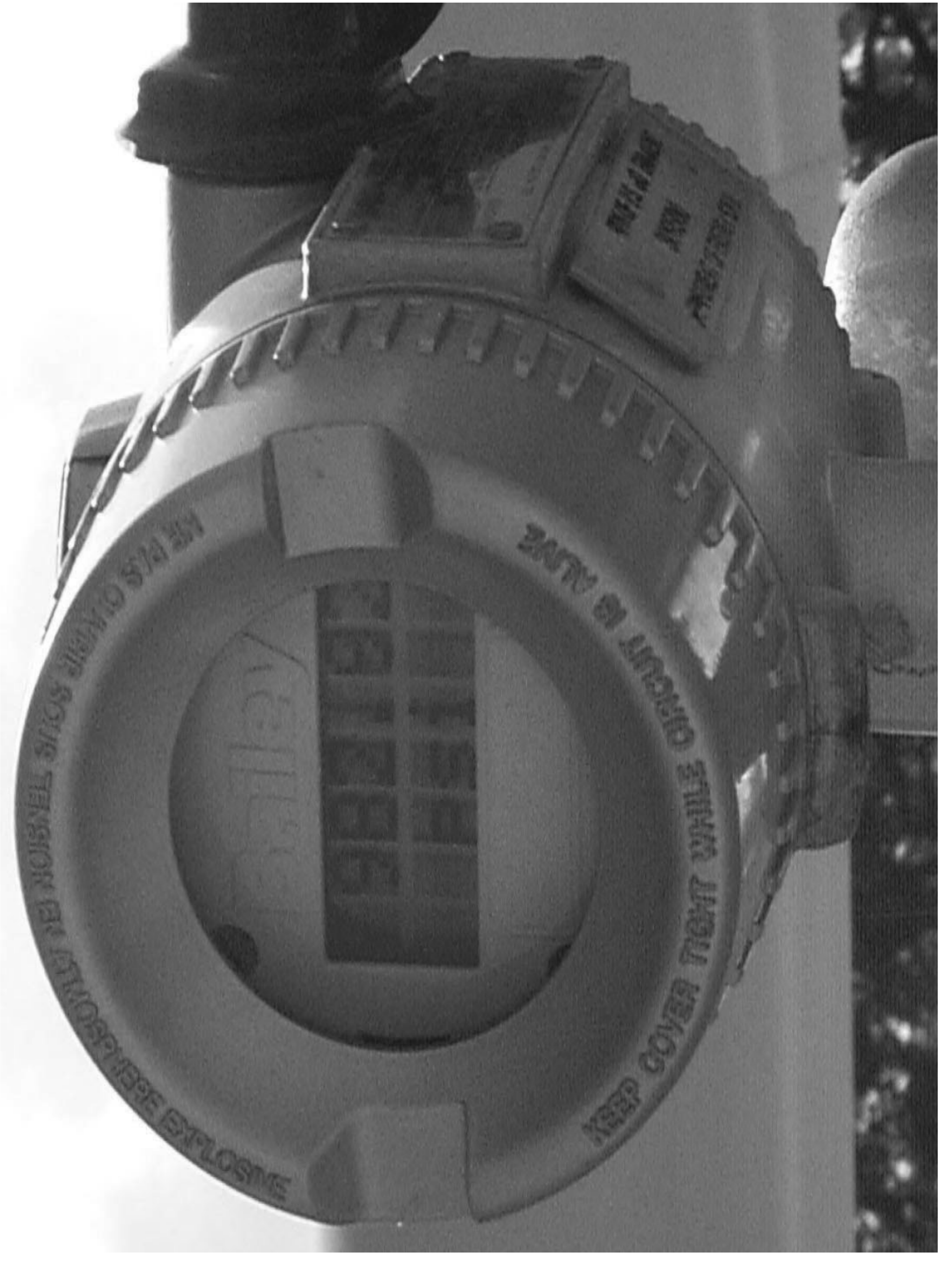
Monitoring Range: 900 to 1040 psi (oil)

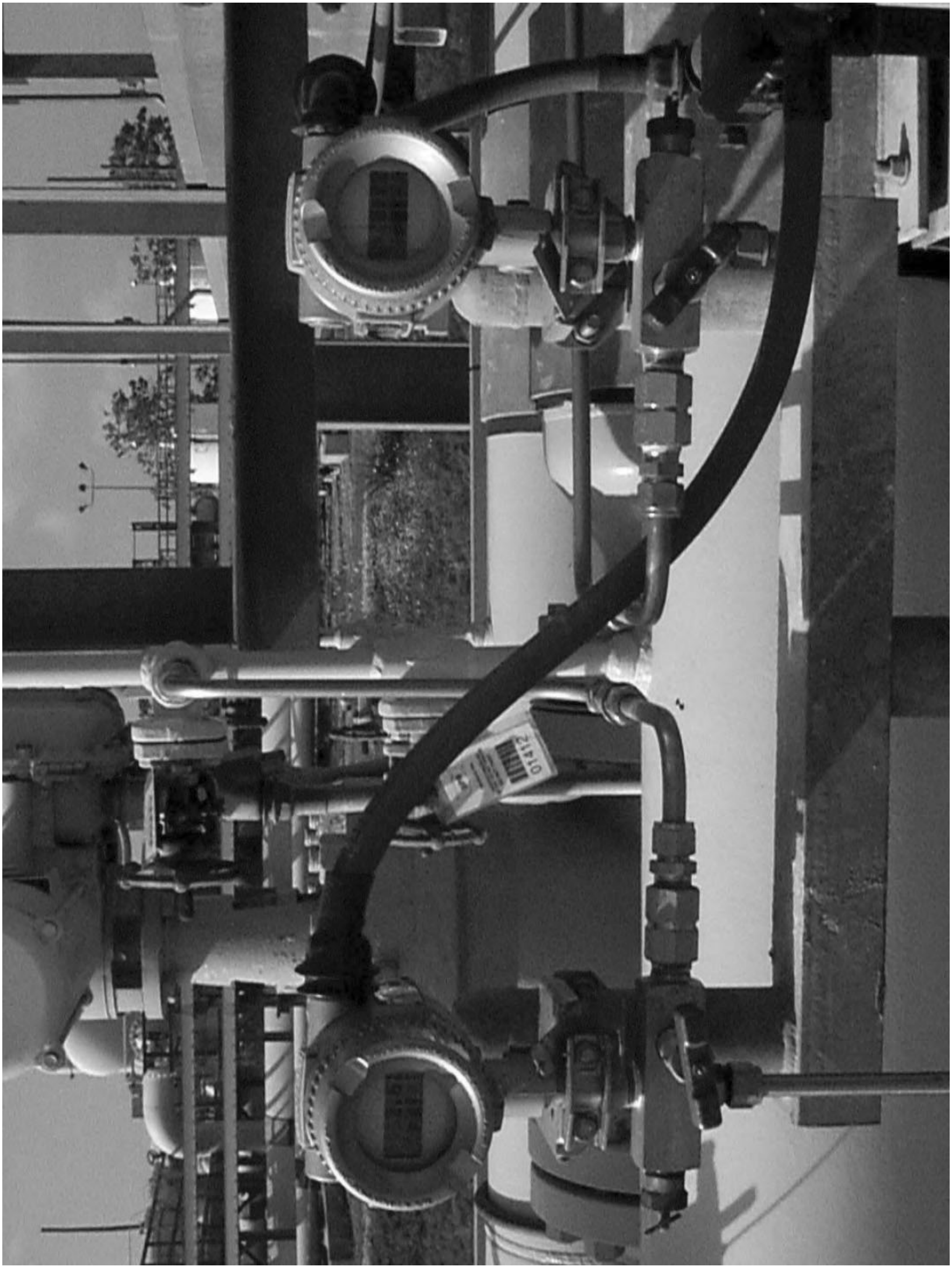
PRESSURES	TIME	PREV.	0610		1245		1810		0345	
WELL BR/RW		297	297		297		297		297	
WELL OIL		981	981		982		982		982	
WELL ANNULUS		979	979		982		981		979	
MANIFOLD OIL		2	0		0		0		0	
CRUDE OIL API / TEMP										
BR/RW SALINITY / TEMP										
WELL CELLAR LEVEL		1/4	1/2	Note:			1/4	Note:		
WELL PAD DIKE LEVEL		2	2				1			
DRAIN VALVE POSITION	Open / Close	Close	Open	Time	Closed	Time 1110	Open	Time	Closed	Time
PSV's SECURED OPEN			☑ YES	☐ NO			☐ YES	☐ NO		
OPERATOR INITIAL'S		KM	KD		HB		MM		MM	
SUPERVISOR REVIEW			INIT. DA		TIME: 1520		INIT. BK		TIME: 2000/0420	

TIME:	OPERATOR'S LOG
	Pad is draining
	Drain Blocked In

LEGEND Pad Dike (1) Empty (2) Some Water (3) Needs Drained (4) Emergency Level

C104 & C101 06/15/99


KEEP COVER TIGHT WHILE CIRCUIT IS ALIVE
EXPLOSIVE


01412


RUDE
NPS-2


VISI-FLO®
FLOW
MAX. PRESS.
200 PSI
@ 150 °F
SEALS
MAX TEMP.
225 °F
@ 150 PSI
opw Engineered Systems
MASON, OHIO, USA

WEST HACKBERRY Pg 1 of 2

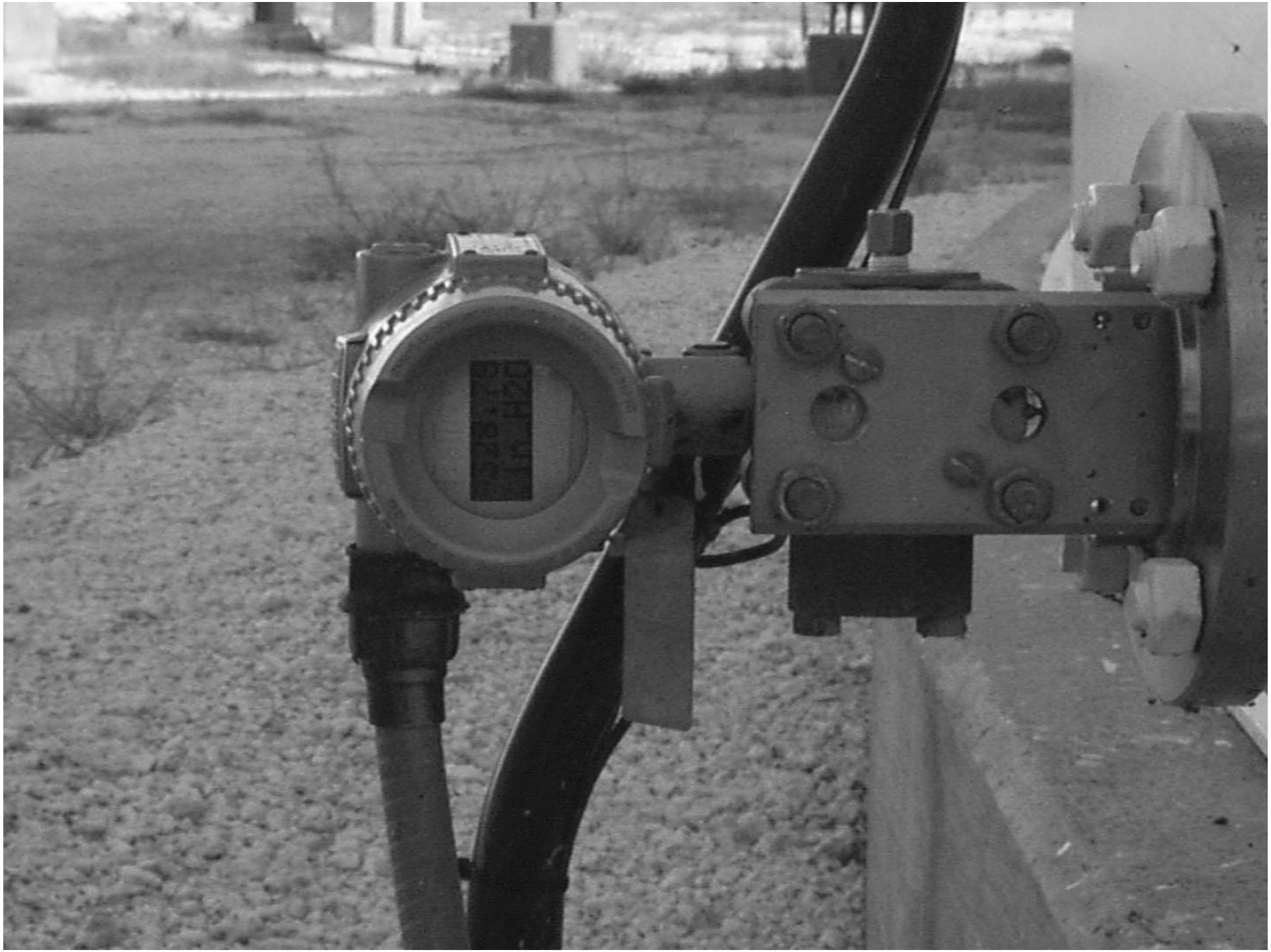
RWINJ PUMP LUBE OIL SYSTEM TOUR SHEET

(Readiness Mode) DATE: 6-29-99 6-30-99

Record data every 2 hours in Readiness Mode		WHP 528 Lube Oil System					WHP 527 Lube Oil System					WHP 526 Lube Oil System					WHP 529 Lube Oil System					WHP 530 Lube Oil System				
TIME	Actual	PI 2 Cooler Out Press	DP Press	PI-37 Cooler In Press	PI-41 Brg In Press	Lube Oil Tank Temp	PI 2 Cooler Out Press	DP Press	PI-37 Cooler In Press	PI-41 Brg In Press	Lube Oil Tank Temp	PI 2 Cooler Out Press	DP Press	PI-37 Cooler In Press	PI-41 Brg In Press	Lube Oil Tank Temp	PI 2 Cooler Out Press	DP Press	PI-37 Cooler In Press	PI-41 Brg In Press	Lube Oil Tank Temp	PI 2 Cooler Out Press	DP Press	PI-37 Cooler In Press	PI-41 Brg In Press	Lube Oil Tank Temp
Prev.	0350	22	4.4	19.2	27	86°	22.5	4.4	20.2	27	97°	23	4	20.7	27	93°	24	5	20.8	30	87°	23	4.5	20.2	27	98°
0600																										
0700	0710	22	4.5	19.2	27	85	22.5	4.5	20.2	27	98	23	4.0	20.1	27	94	24.0	5.0	20.8	30	88	23	4.5	20.2	27	100°
0800																										
0900																										
1000																										
1100																										
1200																										
1300																										
1400																										
1500	1550	21.5	4.0	19.1	27	85°	22.5	4.5	20.2	27	104°	22.6	4.0	20.2	27	104°	23.5	5.0	20.8	29	102°	22.5	4.5	20.1	26	112°
1600																										
1700																										
1800																										
1900																										
2000	2050	21.9	4.2	19.2	27	90°	22.5	4.4	20.2	27	101°	23	4	20.7	27	99°	23.6	5	20.8	30	92°	23	4.5	20.1	27	104°
2100																										
2200																										
2300																										
2400																										
0100																										
0200																										
0300	0350	22	4.5	19.2	27	85°	22.6	4.4	20.2	27	96°	23	4	20.8	27	93°	24	5	20.8	30	87°	22.8	4.4	20.1	27	97°
0400																										
0500																										
Max. Opr. Limit:																										

OPERATORS INITIALS: 0600 to 1800 hours HD Superv. Review: DH Time: 1630 1800 to 0600 hours SM Superv. Review: ME Time: 0440

File Name: RWINJLO.xls Rev. 0 02/17/98



BRINE PUMP STATION LOG SHEET

WEST HACKBERRY BRINE PUMPS

DATE 6-29 to 6 30 '22

	WHP-519			WHP-520			WHP-521			WHP-522			BRINE TANK DATA				
TIME	SUCT. PRESS.	DISC. PRESS.	AMP METER	SUCT. PRESS.	DISC. PRESS.	AMP METER	SUCT. PRESS.	DISC. PRESS.	AMP METER	SUCT. PRESS.	DISC. PRESS.	AMP METER	TANK # 14	TANK # 15	GRAVITY	TEMP.	DECANT TANK (RECORD ONCE PER SHIFT)
PREV.													340'	328"			
0500													340	328			OIL IN TANK YES NO
0700																	
0900																	LOW TANK LEVEL YES NO
1100																	
1300													350	328			LID CLOSED YES NO
1500																	WHP-523 RUNNING YES NO
1700																	
1900													330'	338"			OIL IN TANK YES NO
2100																	
2300																	LOW TANK LEVEL YES NO
0100																	
0300													310"	318"			LID CLOSED YES NO
0500																	WHP-523 RUNNING YES NO

TIME	P1-S	P1-D	P-6	RW1-S	RW1-D	RW2-S	RW2-D	RW5-D	P4-D	P4-S	RW4-D	RW3-D	P3-S	P3-D	P2-S
PREV.	O/S	O/L	O/L	O/L		O/L		O/S	O/L	O/L			O/L		O/S
0645	O/S	O/L	O/L	O/L		O/L		O/S	O/L	O/L			O/S		O/S
1510	O/S	O/L	O/L	O/L		O/L		O/S	O/L	O/L			O/L		O/S
1830	O/S	O/L	O/L	O/L		O/L		O/S	O/L	O/L			O/L		O/S
0345	O/S	O/L	O/L	O/L		O/L		O/S	O/L	O/L			O/L		O/S

OPERATOR LOG:

RECOVERY WELLS IN STANDBY UNTIL FURTHER NOTICE.

RW1-D RW2-D RW3-D RW4-D P3-D

0725 opened HV valve at LPP 1 Pool Control to pump down Brine Pond to WHT 14

opened mov 52 to Fav Inv Tanks @ 1322

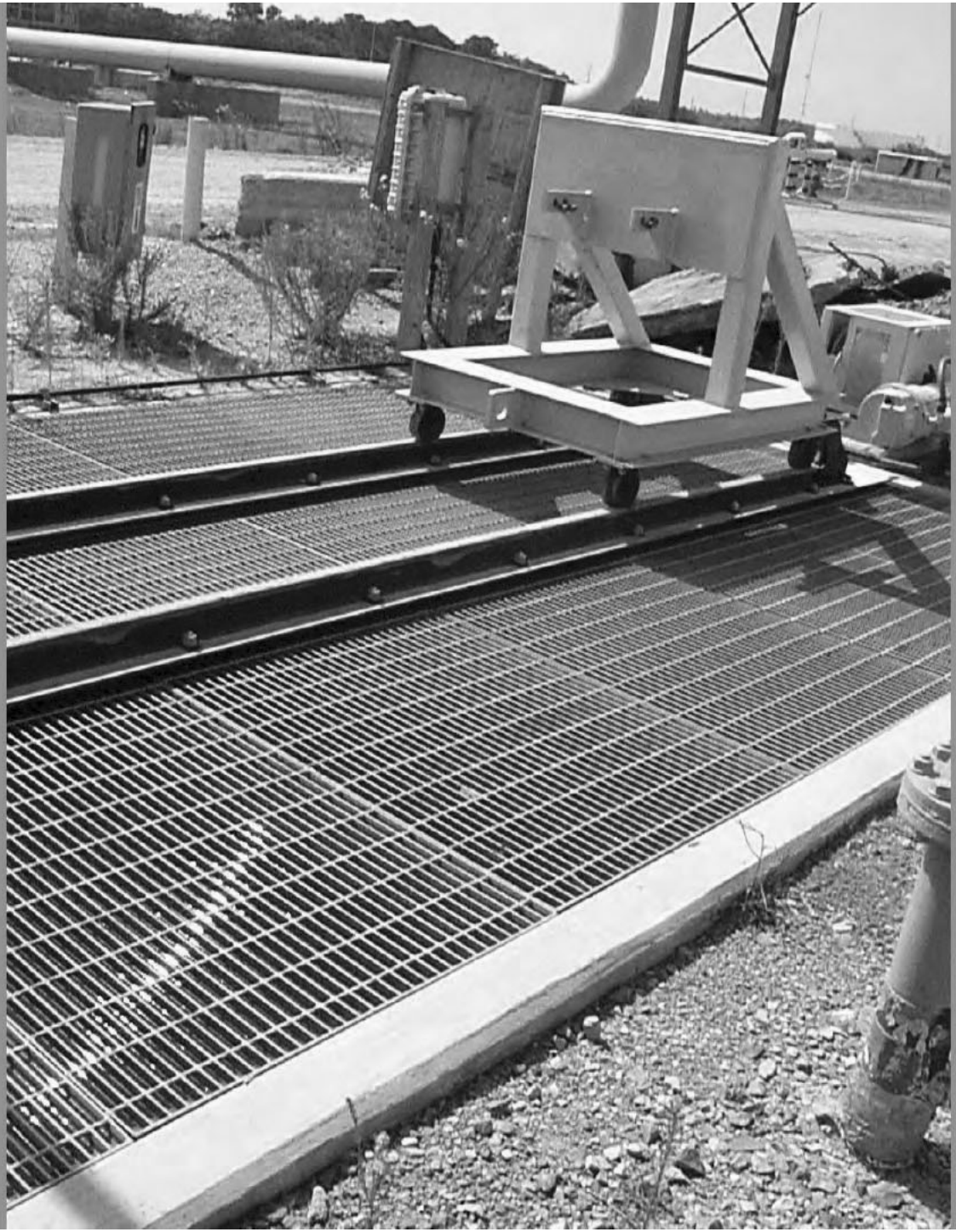
CHECK RECOVERY PUMP MIN. OF TWICE EACH SHIFT. RECORD TIME OF CHECK.

RECORD PUMP STATUS (O/L OR O/S) RECORD REMARKS IN OPERATOR LOG.

OPERATOR INITIALS: DAY SHIFT MD NIGHT SHIFT JL

SUPERVISOR INITIALS: DAY SHIFT DA 1630 NIGHT SHIFT AC 0440

BRINEPUMPSLOG REV. 2 05/21/98



WEST HACKBERRY

BRINE DISPOSAL WELL READING SHEET

DATE: 6-29-99 TO 6-30-99

WELL D2D

TIME	TOUR TIME	TOTALIZER	FLOW TOTAL	PRESSURE (MAOP) ANNULUS (+700)	PRESSURE (MAOP) TUBING
PREV.				30	A/E
0600 HRS.	0730			25	B/I
0800 HRS.					
1000 HRS.					
1200 HRS.					
1400 HRS.					
1600 HRS.					
	SHIFT TOTAL:				
1800 HRS.	1930			25	BI
2000 HRS.					
2200 HRS.					
2400 HRS.					
0200 HRS.					
0400 HRS.					
	SHIFT TOTAL:				
	24 HRS. TOTAL:				

WELL D2B

TIME	TOUR TIME	TOTALIZER	FLOW TOTAL	PRESSURE (MAOP) ANNULUS (+700)	PRESSURE (MAOP) TUBING
				45	A/E
				50	B/I
	SHIFT TOTAL:				
				50	BI
	SHIFT TOTAL:				

WELL D2A

TIME	TOUR TIME	TOTALIZER	FLOW TOTAL	PRESSURE (MAOP) ANNULUS (+700)	PRESSURE (MAOP) TUBING
				30	A/E
				30	B/I
	SHIFT TOTAL:				
				30	BI
	SHIFT TOTAL:				

REMARKS:

WELL D2

TIME	TOUR TIME	TOTALIZER	FLOW TOTAL	PRESSURE (MAOP) ANNULUS (+700)	PRESSURE (MAOP) TUBING
0600 HRS.				85	A/E
0800 HRS.				80	B/I
1000 HRS.					
1200 HRS.					
1400 HRS.					
1600 HRS.					
	SHIFT TOTAL:				
1800 HRS.	1930			80	BI
2000 HRS.					
2200 HRS.					
2400 HRS.					
0200 HRS.					
0400 HRS.					
	SHIFT TOTAL:				
	24 HRS. TOTAL:				

WELL D2C

TIME	TOUR TIME	TOTALIZER	FLOW TOTAL	PRESSURE (MAOP) ANNULUS (+700)	PRESSURE (MAOP) TUBING
				4	17
				4	17
	SHIFT TOTAL:				
				4	17
	SHIFT TOTAL:				
	24 HRS. TOTAL:				

WELL D2E

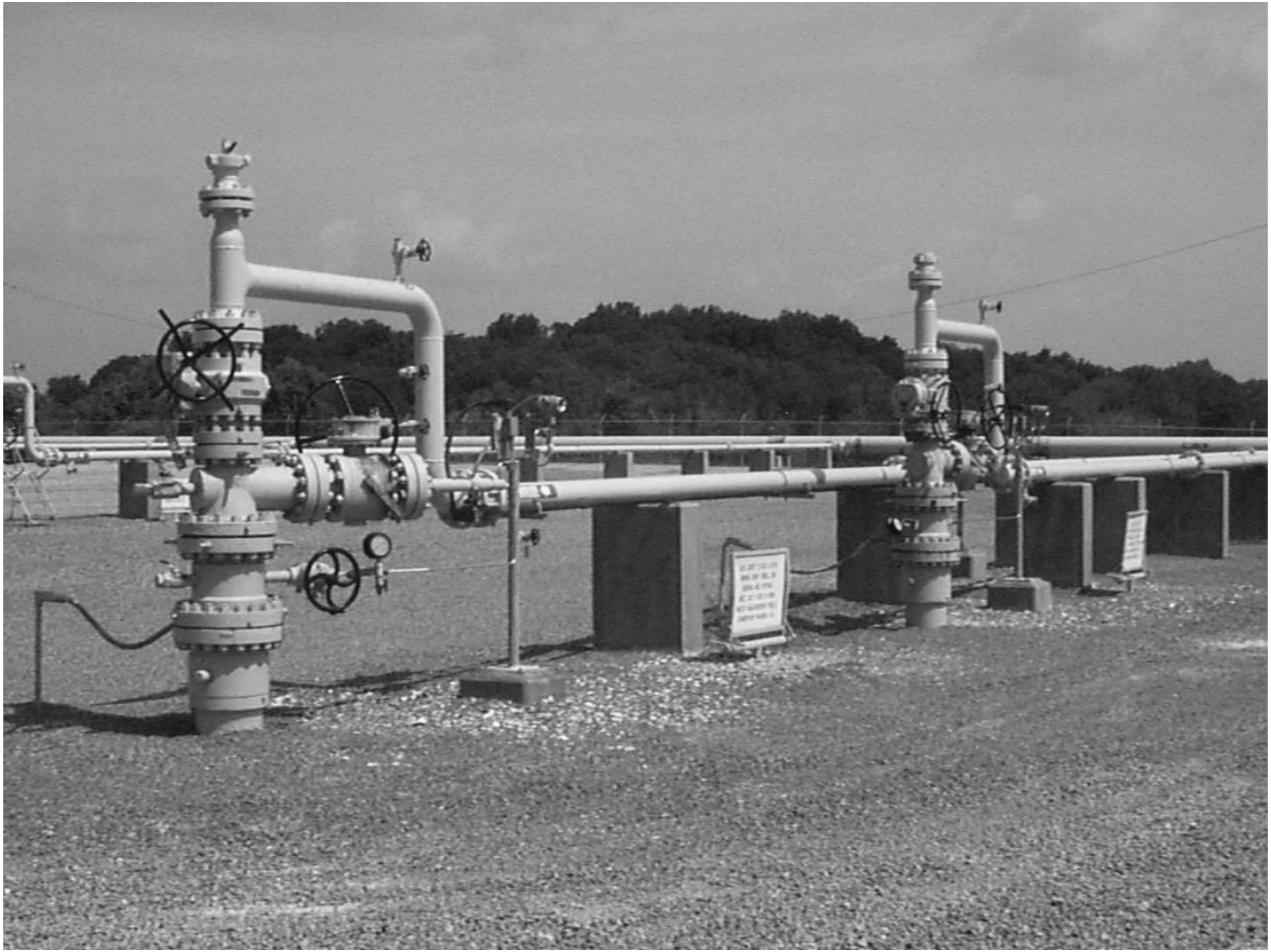
TIME	TOUR TIME	TOTALIZER	FLOW TOTAL	PRESSURE (MAOP) ANNULUS (+700)	PRESSURE (MAOP) TUBING
				0	A/E
				0	B/E
	SHIFT TOTAL:				
				0	BI
	SHIFT TOTAL:				
	24 HRS. TOTAL:				

CAV. 1 0600-1800 SUPERVISOR REVIEW:

CAV. 1 1800-0600 SUPERVISOR REVIEW: 0445

FILE: BDWSHEET .XLS REV.2 06/21/99

A.O Test D2C

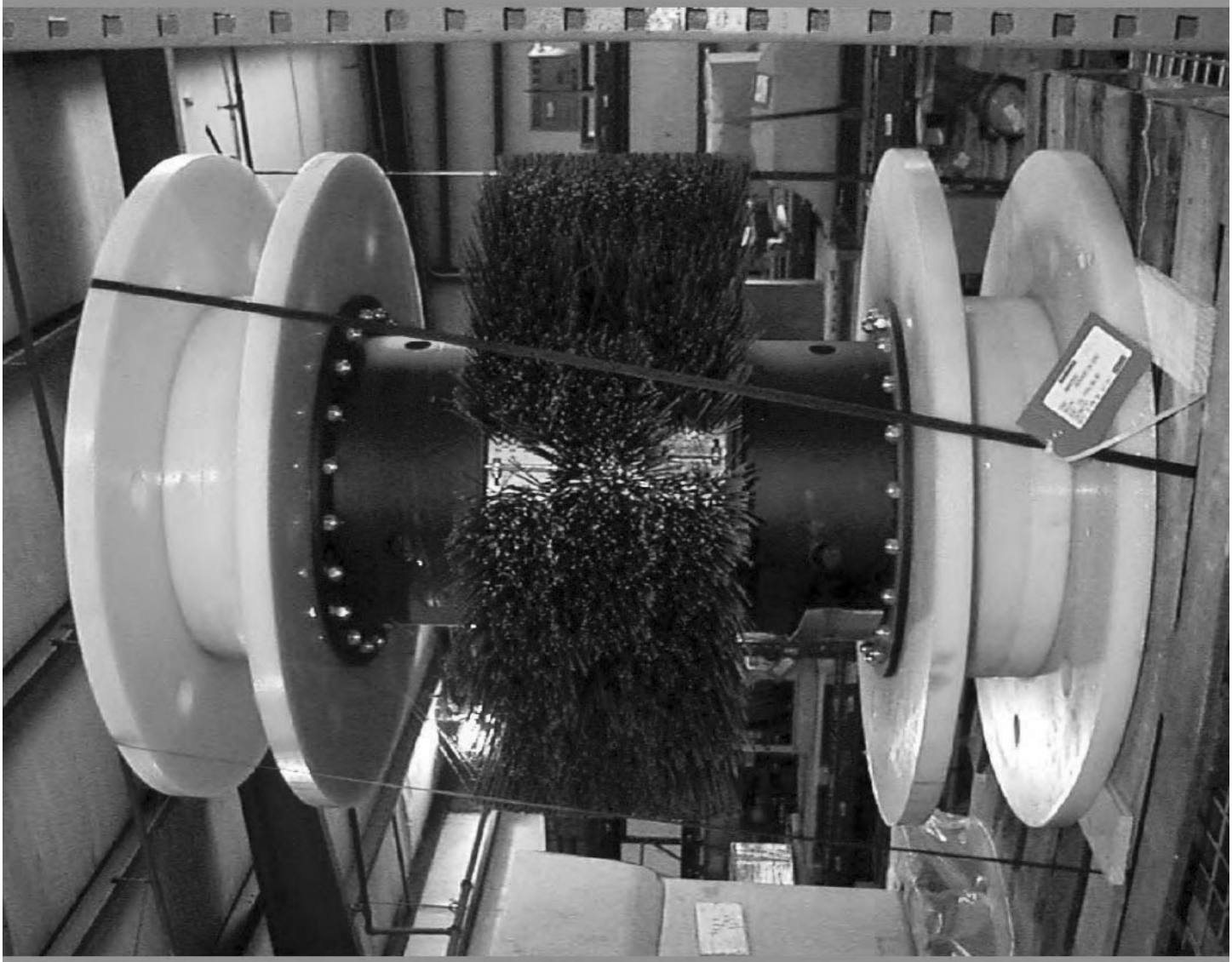



METER SN-6SBF1269
"K" = 6.60 PPG
"K" = 277.20 PPBbl
4-20 madc = 0 TO 86,000 BPD
MAX FREQUENCY 275.9 Hz
RATI
BIb/H
TOTA
BARRE
MODEL BATRT-2-C
SN - FE116302
D


DANGER
NOTICE

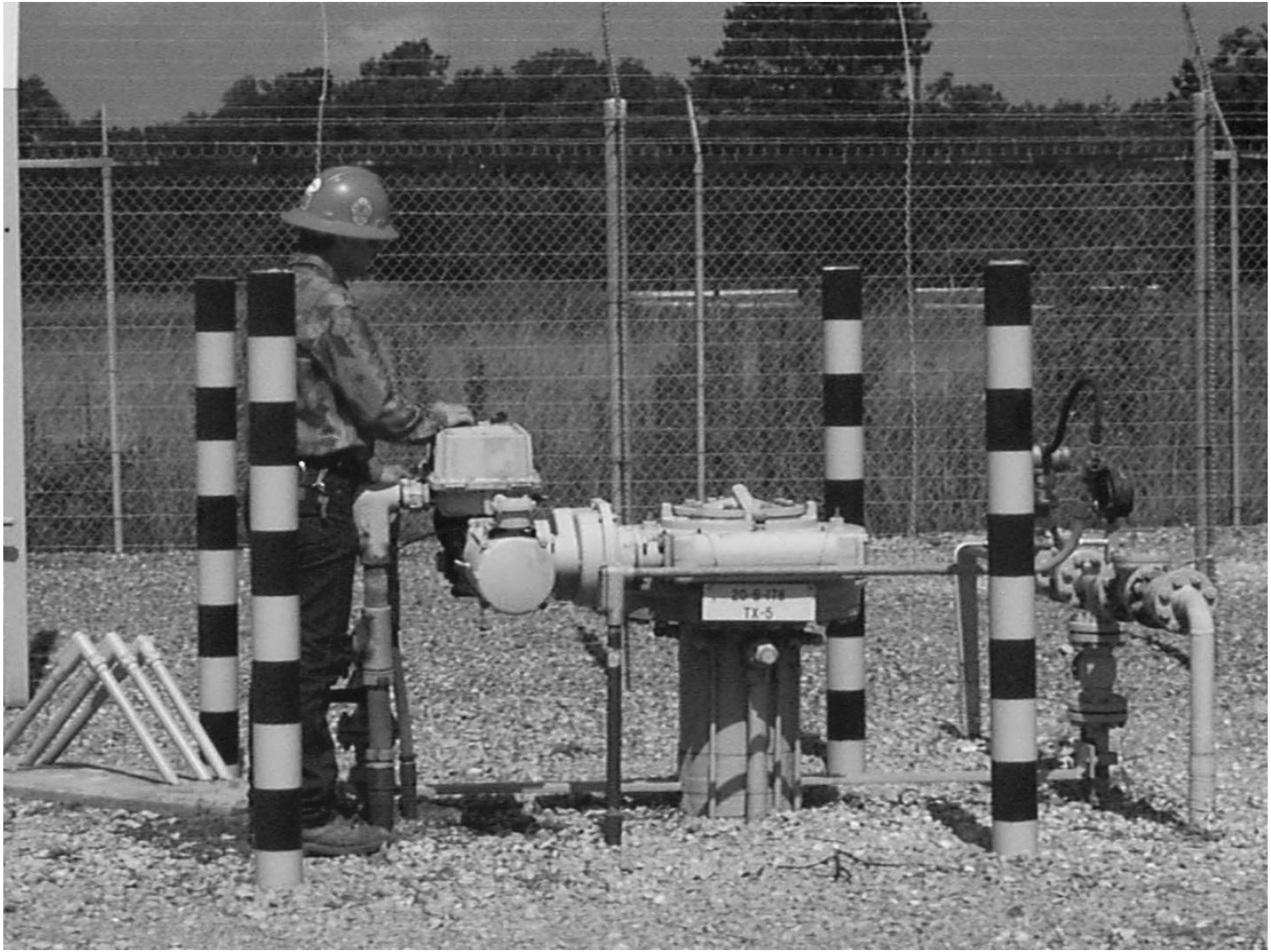

3
3


4




W/BRINE


DANGER
HIGH VOLTAGE
480 VOLTS


TX-5


3P530

SPR SAFE WORK PERMIT NO. 223306

SECTION I ✓ HOT WORK __ CONFINED SPACE __ LOCKOUT/TAGOUT __ MISC PERMIT __ EXCAVATION __ SAFE CLEARANCE

SITE W.H. REFERENCE NUMBER 812116

CONTRACTOR REQUESTING PERMIT OM - Electrical DATE 6/30/99

LOCATION OF WORK TO BE PERFORMED Cavern 116 sump pump DURATION OF PERMIT 12 hrs

TYPE OF EQUIPMENT Scoopers and Hand Tools Test Equipment.

DESCRIPTION OF WORK WHP-189 will not Run in Hand or Auto check out and Fix problem.

SECTION II

A. (CHECK ONE) JOB SAFETY ANALYSIS ____ JOB HAZARD ANALYSIS ____ PPE HAZARD ASSESSMENT ✓

B. REVIEWED THE CHECKED ABOVE ANALYSIS OR ASSESSMENT WITH EMPLOYEES ✓

REQUIRED PPE AS IDENTIFIED BY ANALYSIS OR ASSESSMENT

PPE	NEEDED	PPE	NEEDED	PPE AND EQUIPMENT	NEEDED
GOGGLES		HEARING PROTECTION	✓	HEAD PROTECTION	✓
FACESHIELD		HIGH VOLTAGE PROTECTION		FOOT PROTECTION	✓
SAFETY GLASSES	✓	LOW VOLTAGE PROTECTION		GFCI	
HAND PROTECTION	✓	FULL BODY PROTECTION		ELECTRICAL GROUNDING	
FALL PROTECTION		RESPIRATORY PROTECTION			
SCSR		DIELECTRIC BOOTS			
LIFE JACKETS		DIELECTRIC GLOVES			

SECTION III

	REQUIRED	COMP./INIT.		REQUIRED	COMP./INIT.
CATHODIC PROTECTION INSTALL DEACTIVATED			FORCED VENTILATION REQUESTED		
HAZARDOUS ENERGY SOURCES LOCKED AND TAGGED			BARRICADES/BARRIERS		
QUALIFIED ELECTRICAL BACKUP	✓	DA	CRC MEETING MINUTES ATTACH		
MANHOLES SUMPS AND SEWERS COVERED			CEC PLANS ATTACHED		
EQUIPMENT DEPRESSURIZED/PURGED DRAINED, NEUTRALIZED			CONFINED SPACE PLANS ATTACH.		
LINES DISCONNECTED/BLINDED AND/OR PLUGGED/PACKED			EXCAVATION PLAN ATTACHED		
ADJACENT EQUIPMENT SAFE I.E. VAPORS, LEAKING SEALS, PACKING	✓	DA	HOT TAP PROCEDURES ATTACH		
COMBUSTIBLES MOVED OR COVERED WITH FLAME RESISTANT MATERIAL			LOCKOUT/TAGOUT FORM ATTACH.		
PIPING, CONDUIT, CABLES, WIRING LOCATED/MARKED	✓	DA	IRMA#		
PERMIT REQUIRED CONFINED SPACE ALTERNATE PROCEDURE FORM ATTACH. (IF APPLICABLE)					

BURIED HAZARDS ARE MARKED AND PRECAUTIONS TAKEN ____

CHECKED BY ____ SIGNATURE

SECTION IV

	NEED	PEL	ACTUAL READING		TIME/INIT.	ACTUALREADING	TIME/INIT.
COMBUSTIBLE GAS TEST REQUIRED	✓	0%LEL	0	% LEL	0700 RD	% LEL	
OXYGEN CONTENT TEST REQUIRED		19.5%		% O_2		% O_2	
H2S GAS TEST REQUIRED	✓	10 PPM	0	PPM	0700 RD	PPM	
CO TEST REQUIRED		35PPM		PPM		PPM	
LEL FOR CONFINED SPACE		10 %		%		%	
CONTINUOUS MONITORING REQUIRED		%					
AREA TESTED FOR GAS (LOCATION)							

FIRE PROTECTION REQUIRED __ FIREWATCH __ FIRE HOSE ✓ FIRE EXTINGUISHER __ FLAME RESISTANT MATERIAL __ FIRE TRUCK

OTHER ____

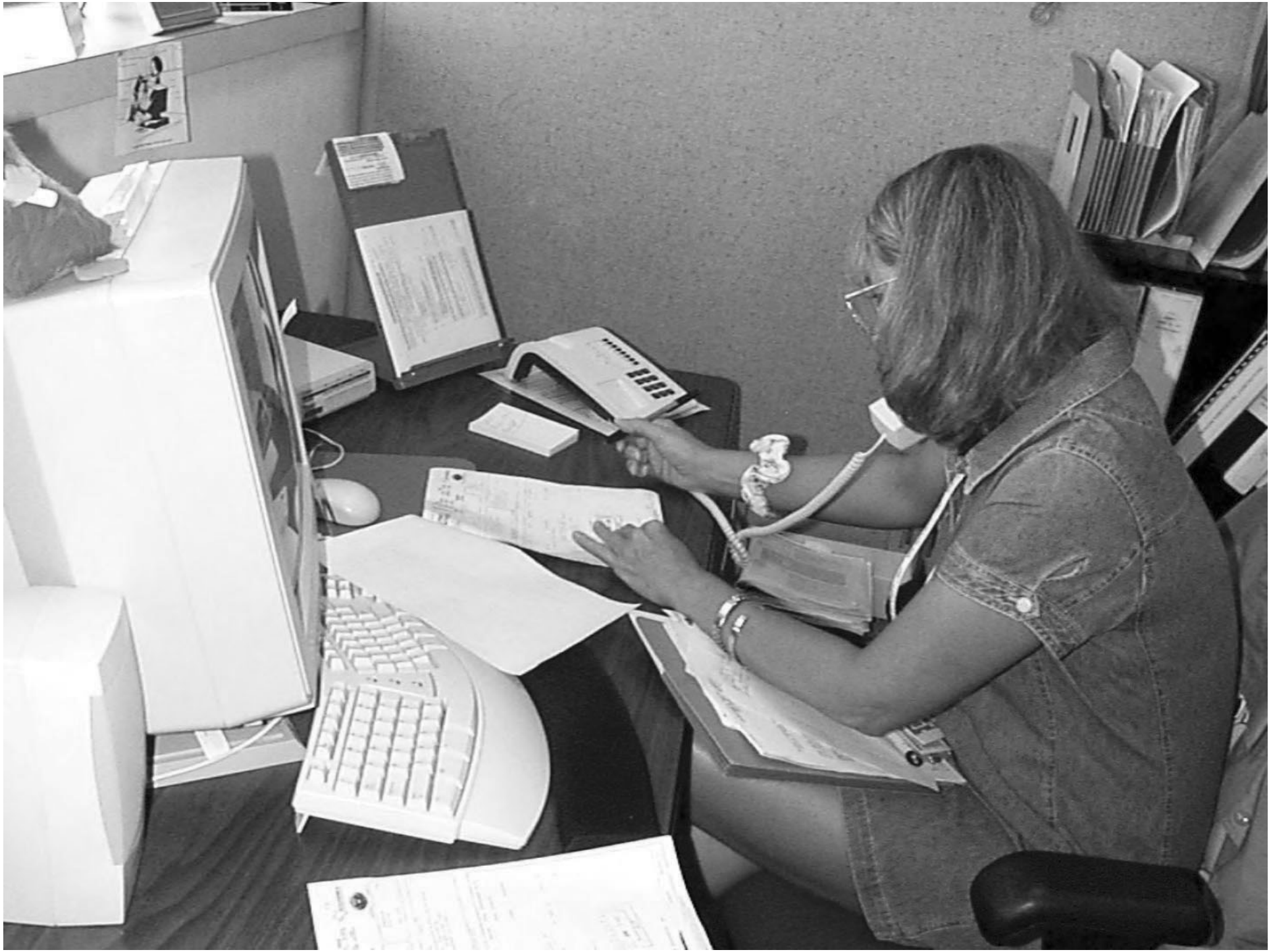
DESIGNATED SMOKING AREA ____

SECTION V PERMIT APPROVAL

TITLE	SIGNATURE	DATE	TIME	PERMIT CLOSEOUT	DATE	INIT.
SUP/TR	[signature]	6/30/99	0630	JOB COMPLETE/TECH CONT	6/30/99	C.R.
TECH/CONT	[signature]	6/30/99	0700	HOUSEKEEPING/EMPLOYEE/EQUIPMENT	6/30/99	C.R.
SAFETY				PERMIT COMPLETE SUPERVISOR/SITE	6/30/99	C.R.
OPS/DESIGN	[signature]	6/30/99	0700	PERMIT COMPLETE/CONT DESIGNEE	6/30/99	DA

OSP83-0067 2/93 REV. 5/98

DISTRIBUTION: WHITE: POSTED AT WORK LOCATION/PINK: POSTED




25
27
29
114
114


1
2
3
4
5
6
2
3
4
5
LOAD LIMIT
400 LBS
PER SHELF


SECURITY

National Nuclear Security Administration

1) **Pantex Plant, Balance of Plant**
ALO-AO-BWXP-PANTEX-2004-0036-**Summary Report of Legacy Suspect/Counterfeit Items**-(Significance Category 4)
Site personnel removed 14 suspect/counterfeit (S/C) fasteners from non-critical onsite installations. The S/C fasteners were removed as part of normal maintenance activities.

6) **Y-12 Plant, Y12 Nuclear Operations**
ORO-BWXT-Y12NUCLEAR-2004-0013-**Potential USQD-Concrete Falling From Ceiling**-(Significance Category 3)
Site personnel determined a potential inadequacy of the documented safety analysis condition after an employee found pieces of concrete on the floor in the basement of Building 9215 that had fallen from the concrete ceiling. Later, management set-up boundary controls to limit access to this basement area, and a machine on the floor above the area was taken out of service. A critique was scheduled.

Office of Science

5) **Oakland, Stanford University, Stanford Linear Accelerator Center**
OAK-SU-SLAC-2004-0002-**Unlocked Doors Found in Rad Calibration Facility**-(Significance Category 4)
Two security guards found that the outside door on the south side of the Radiological Calibration Facility (RCF) was unlocked. Later, site personnel also found a second door between Room 167 and the RCF that was unlocked. No radiation sources in either the RCF or Room 167 were found missing or out of their shielded enclosures. Both doors were then locked, as required. An investigation by the Radiation Protection Department into the unlocked doors is underway.

Nuclear Energy, Science and Technology

4) **Idaho, Idaho National Engineering Laboratory, Test Reactor Area**
ID-BBWI-TRA-2004-0002-**Failure to Follow Hazard Mitigation Steps in Work Control Document While Performing Work**-(Significance Category 4)

As a worker was dismantling a vacuum pump that was located just inside the Mass Separator High Voltage Cage in TRA-661, the DOE Facility Representative (FR) determined that the worker had not followed the hazard mitigation steps in the Job Safety Analysis, as required. The work was stopped. Prior to entering the Cage, removal of the jumpers in the electrical system was identified as one of the mitigating actions for the electrical shock hazard. However, the FR noticed that two of the jumpers were still connected. Upon further investigation, it was noticed that the worker had skipped several other mitigating actions while working on the vacuum pump. A critique was held.

Fossil Energy

2) **Headquarters, Big Hill Site, Balance of Plant**
HQ-SPR-BH-2004-0001-**Significant Fire Safety Management Concern**-(Significance Category 3)
An employee at the Big Hill site was drilling a hole into a tubular steel gate frame when a flash fire occurred, resulting in the employee receiving first and second degree burns on both hands and his right arm. Apparently, he penetrated the wall of the tubular steel, and released/ignited flammable vapors that were trapped inside the tubing. The work was immediately stopped and the employee was transported off site for medical attention. Management has initiated an investigation.

3) **Headquarters, West Hackberry Site, Balance of Plant**
HQ-SPR-WH-2004-0001-**5-10 Barrels of Brine Overflowed a Frac Tank During Sand Lift Operations at BDW2E**
-(Significance Category 4)
During sand lift operations on Brine Disposal Well 2E, approximately 5-10 barrels of brine spilled onto the ground. The brine did not leave the site boundaries. As the fluid being lifted was processed on two open-top Frac Tanks, the well began returning more sand than expected into the tanks. The tank pump then lost prime, and before a vacuum truck could be moved into position and remove brine from the tank, brine splashed out of the west Frac Tank. Later, a vacuum truck at the site moved into position and lowered the fluid level in the Frac Tank, and arrangements were made to remove sand from both Frac Tanks.

Environmental Management

7) **Richland, Hanford Site, Facility & Site Services**
RL-PHMC-FSS-2004-0002-**Contaminated Soil at WIDS Site 200-E-139**-(Significance Category 4)
During a surveillance, two areas of soil contamination were found. The maximum level of contamination was 149,000 dpm/100cm2 beta-gamma, no alpha. The soil was removed, packaged, labeled and transported to a Radioactive Material Area. Later, a one square meter area survey around both contamination areas was performed, but no additional contamination was found.

8) **River Protection, Hanford Site, Tank Farms**
RP-CHG-TANKFARM-2004-0022-**Data Review Raises Questions About Nitrous Oxide Concentrations in Tank Farms Yielding Updated Industrial Hygiene Requirements**-(Significance Category 4)

During a review, site personnel identified data that raised questions regarding a potential for personnel exposure to nitrous oxide during tank farm work. Although a preliminary review of the data does not indicate that exposure has, or may, occur, additional reviews are being conducted to ensure that monitoring/controls for nitrous oxide remains effective. Special controls (supplied air or self contained breathing apparatus) are required and additional access controls were implemented.

9) **River Protection, Hanford Site, Tank Farms**
RP-CHG-TANKFARM-2004-0023-**Increased Dose Rates Observed at the Clean Out Boxes COB-AW-01 AND COB-AW-02 Excavation Areas Following 242-A Evaporator Campaign**-(Significance Category 2)

A critique was held due to the increased dose rates observed at two clean-out box excavation areas following the 242-A Evaporator Campaign. During this investigation, site personnel determined that the configuration of the slurry transfer line and its associated transfer structures are in question. Both the encasement and slurry transfer line may have been inoperable during the 242-A Evaporator Campaign. The safety significance is indeterminate as the investigation is not yet complete. As a precaution, administrative controls were put in place to restrict all transfer operations until the investigation is completed and the configuration is verified. Access to both excavation areas was restricted (area in question had been previously posted/controlled as a High Radiation Area). A meeting was scheduled to continue the in-progress investigation.

10) Savannah River, Savannah River Site, H-Canyon
SR-WSRC-HCAN-2004-0006-**Calibration Check Failure for 1D Bank Neutron Monitor (U)**-(Significance Category 3)
During a calibration check of the 1D Bank Neutron Monitor, Point 2 was found out-of-acceptable range on the low side. The calibration specification is 0.5% and was found to be a maximum of 0.625% out-of-the-acceptable range on the low side. Equipment calibrations were completed and the instrument set points were returned to the acceptable range.

<<tuesday ORPS-042004.htm>>

From:	Johnson, David
To:	Mcconnell; Charles; Klara; Scott; McIlwain; Serena; Grasser; John; Fee; Robert
Cc:	Elias; Wayne; Hoffman; Rick; Silawsky; Donald; Harvey; Nathan; Gibson; William; Greenhalgh; Diana
Subject:	Petroleum Reserves Activities
Date:	Friday, August 3, 2012 7:22:28 PM
Attachments:	08-03-12 Weekly Highlights for the ASFE.docx

Sir:Attached is my one-page summary of last week's highlights of the Petroleum Reserves activities. A couple of items I would like to bring to your attention:Senate Staff Briefing The meeting with Ben Billings of Sen. Landrieu's staff on SPR Jones Act went very well. Discussions focused on the constraints of SPR loading terminals, industry unloading, US vessel size, loading times and costs, and IEA requirements. ASFE Meeting with DM Corporate Scheduled for you and I next Thursday, August 09, 2012 11:30 AM-12:30 PM Purpose: DM requested follow-up to the meeting they had with us earlier this year . Attendees will be: Alan Weakley (President, CSC), Rogers Starr (President, Jacobs Technology) and Richard Courtney (President and CEO, IMTT) or Jamie Coleman (CAO, IMTT). Topics: Change of ownership Update on Judgment of Needs (JONs) and corporate response to accident Commitment of new owners to SPR mission. Dave

WEEKLY HIGHLIGHTS OF PETROLEUM RESERVES ACTIVITIES
For the Week Ending August 3, 2012

SPR Drawdown Readiness Status

- SPR currently has 696 million barrels of crude oil in storage. (DD Available - 646 million)
- The SPR is at full readiness to draw down if required.
- Crude prices soared $4.00/B on Friday – WTI closed at $91.40 and Brent at $109/B (10 week high). Price increase attributed to the better-than expected job additions. (I believe it was Congress starting their August Recess today.)

SPR Jones Act Issues and Drawdown Strategies

- SPR Briefed Ben Billings of Senator Landrieu's staff on SPR Jones Act issues on Thu, Aug 2. Briefing went excellent - Discussed constraints of SPR terminals, refineries, & US flag vessels.

(b) (5)

NEHHOR Status

- NEHHOR holds 1.0 million barrels of ULS Heating Oil in storage in New England.
- SPR queried & received details on DLA's pricing methodology for the invoiced ULSD purchases.
- The DLA pricing methodology is not what DOE agreed to. DAS will discuss with DLA commander.

International Activities

- IEA Executive Director, Maria Van Der Hoeven, plans to visit the SPR Big Hill Texas site on Aug 17. DAS Johnson, Jon Eklind (PI-1) and Bob Cekuta (DOS) will accompany Ms. Van Der Hoeven.

Mystery Oil Spill near SPR WH Site

- West Hackberry site personnel reported an oil sheen on Black Lake to authorities on July 30th.
- SPR personnel immediately deployed a containment boom and absorbent pads to collect oil.
- The USCG is still investigating and suspect a privately-owned workover rig in Black Lake.
- All oil has been cleaned up. No impact to the SPR site.

SPR Fatality Corrective Action Closure Progress (Correction to Last Week)

- SPR Tank Cleaning incident of Jul 8, 2010 – All 123 Corrective Actions completed by SPR PMO and validated by FE-40 independent review. Final Closeout Report was forwarded to HSS on 7/27.
- SPR Lawn Mower incident of Aug 13, 2011 – All but 5 of the Corrective Actions (JONs) have been completed by SPR PMO. FE-40 will be performing an independent validation once completed.

Safety

- Safety Incidents – **First Aid Only**.
  7/30—(BC) Subcontractor was using a string trimmer to cut grass when he began to feel dizzy from the heat. He was treated with air conditioning and fluids.
  7/30 – (BC) Subcontractor custodian received an insect bite on neck. Antibiotic ointment and band aid were applied.
- July 31—Safety Series Video 19 regarding Human Wellness was delivered to PMO personnel.
- July 31—Webinar "Silent Danger: Five Conversations that Drive Safety" was broadcast.

From: Hribar, Robert
To: Friedmann; Julio
Subject: FW: SPR Implementation of OMB Circular A-123
Date: Tuesday, February 16, 2016 12:51:21 PM
Attachments: SPRO Entity Control Areas.docx
Copy of SPRO 3RD QTR FMA_4 3_DOE_FY15_20150501.xlsm
Copy of SPRO DOE 2015 EAT TOOL.xlsm
2015 Field Assurance Memorandum FINAL SIGNED.pdf

Julio,

We had one action from the Enterprise Risk Assessment meeting with John MacWilliams, and SPRO has answered the question.

With your approval, I will forward Bob Corbin's response to John MacWilliams' office.

v/r

Bob Hribar

202-586-4733

From: Corbin, Robert
Sent: Tuesday, February 16, 2016 11:19 AM
To: Hribar, Robert <Robert.Hribar@hq.doe.gov>
Cc: Pafe, Robert <Robert.Pafe@hq.doe.gov>; Hoffman, Rick <Rick.Hoffman@hq.doe.gov>
Subject: FW: SPR Implementation of OMB Circular A-123

Bob H.,

This is in response to the below question, and your follow-up email from this morning.

Q. How does SPRO manage risk using OMB Circular A-123? [John MacWilliams asked if this was true, since you had stated you used for internal control, though A-123 is more concerned with enterprise risk].

Please see below email and attached documents from SPR PMO that are responsive. Thanks.

Bob

From: Gibson, Hoot [mailto:Hoot.Gibson@SPR.DOE.GOV]
Sent: Tuesday, February 16, 2016 10:43 AM
To: Corbin, Robert <Robert.Corbin@hq.doe.gov>
Cc: Hoffman, Rick <Rick.Hoffman@hq.doe.gov>; McWilliams, Michael <michael.mcwilliams@spr.doe.gov>
Subject: FW: SPR Implementation of OMB Circular A-123

The following is provided to answer the Risk Management question posed in late January:

I. DOE implemented the A-123 toolkit in 2006 and it has been evolving on almost a monthly basis.

A. The Financial Management Assurance (FMA) Tool is part of the DOE A-123 toolkit and is composed of corporate and local framework, risk assessment and corrective action plans. SPRO annually reviews all six of the financial cycles and their processes and sub-processes. We determine the risks associated with each area and plan our testing of internal controls accordingly. So we are evaluating our internal controls on a regular basis. We test each area on a three year cyclical plan. This plan is adjusted as we deem necessary according to the level of risk, corporate or local. High risk areas are tested on an annual basis, medium every two years and low every three years. When testing we are looking at the Internal Controls in place and how effectively they mitigate the risk statements. As of right now SPRO does not have any High Risk Financial areas. The Corporate Risks are developed each year by the CFO office and are driven by the Annual Audit Report. We deliver a completed FMA tool at the end of every 2nd and 3rd Quarter to the DOE Office of Internal Controls.

B. The Entity Assessment Tool (EAT) is also a component of the DOE A-123 toolkit and is developed by identifying Entity Control Areas specific to SPRO (see attached) based upon the risk assessment process. SPRO has identified 27 Entity Control Areas that are evaluated by management throughout the year and reported on annually. Management determines the

risk associated with each area and tests the internal controls accordingly. Each area is evaluated in order to determine if the controls in place effectively mitigate identified risk. The completed Entity Assessment Tool is delivered at the end of the 3rd quarter to the DOE Office of Internal Controls.

C. If we find something in our testing or evaluation we report it by phone and document it in the appropriate Tool. We would then use the corrective action plan, which is also imbedded in Tool, which allows Headquarters to track the resolution of issues. The FY 2015 toolkit assessments are attached. These assessments form the basis for our Annual Assurance Memorandum (copy of FY 2015 memo attached).

II. OMB is currently working on revising OMB Circular A-123 Management's Responsibility for Internal Control, its first revision in 10 years. This revised circular provides new guidance for linking Enterprise Risk Management (ERM) and Internal Control (IC) to provide stronger risk management. ERM is actually broader than internal control and focuses more directly on risk. The SPR will conform to DOE's implementation of these new requirements.

Mike

Department of Energy
Strategic Petroleum Reserve Project Management Office
900 Commerce East
New Orleans, Louisiana 70123

MEMORANDUM TO THE ASSISTANT SECRETARY FOR FOSSIL ENERGY:

THRU: Robert H. Pafe, Director, Office of Budget and Financial Management 7-31-15

THRU Robert Corbin, Deputy Assistant Secretary for Petroleum Reserves, 7/27/15

FROM: William C. Gibson, Jr., Project Manager, Strategic Petroleum Reserve, FE-44 7/15/15

Sheldra A. Wormhoudt, Field Chief Financial Officer, FE-4452 7/15/15

SUBJECT: ACTION: Assurances of Internal Control - Federal Managers' Financial Integrity Act (FMFIA), Office of Management and Budget (OMB) Circular A-123, Appendix A, FMFIA (Section II) – Internal Control

FMFIA (Section II – Non-Financial Internal Controls)

In accordance with the Federal Managers' Financial Integrity Act, I have completed a non-financial controls assessment of the internal controls for the Strategic Petroleum Reserve Project Management Office (SPRPMO) in effect as of July 2, 2015. The review was performed in conformity with Departmental guidelines and accordingly included a review of whether the internal controls were in compliance with underlying management principles which incorporate the Government Accountability Office's Standards for Internal Controls in the Federal Government. The review included the consideration of the results of audit reports, internal management reviews, computer security reviews, assurances from major contractors under my cognizance, and all other known information. In addition, our review considered the areas of (1) environmental management and (2) non-nuclear safety management, and no problems were identified. The results of the review indicate there is reasonable assurance that the internal controls were working effectively and that program and administrative functions were performed in an economical and efficient manner consistent with applicable laws; property, funds and other resources were safeguarded against waste, loss, unauthorized use or misappropriation; obligations and costs were proper; and accountability for assets was maintained. The concept of reasonable assurance recognizes that internal controls must be cost effective, and there is always some potential for errors or irregularities to go undetected.

The review disclosed the following reportable condition:

SPR Infrastructure Sustainability (Reportable Condition)

The SPRPMO has assiduously addressed "Cavern Well Casing Remediation" and "Capacity Maintenance" as Reportable Conditions in the annual internal control evaluation process and submittals, beginning with the 2013 Assurance Memorandum. The SPR's comprehensive assessment programs that inform management of risk tradeoffs had long identified the issues relating to those reportable conditions. The Department's Office of Inspector General July 2014 Audit Report (DOE/IG-0916), *The Strategic Petroleum Reserve's Drawdown Readiness*, provided the first independent assessment of mission readiness with regard to the consequences of the aging SPR infrastructure. The near parallel review of the SPR by the U.S. General Accountability Office September 2014 report further identified the necessity of a broader approach to the infrastructure/mission interdependencies. The OIG and GAO reviews initiated a Department-wide review of the demonstrated infrastructure/mission dislocations and risks to mission objectives, without incurring unacceptable risks to the environment, SPR personnel, Federal and contractor, and the public.

The case and requirements for directed and focused Life Extension investments in optimizing the SPR's emergency response capability were outlined in Chapter IV, Modernizing U.S. Energy Security Infrastructures in a Changing Global Marketplace, of the of The Quadrennial Energy Review (QER). The Assistant Secretary for Fossil Energy testimony, of April 30, 2015, before the Subcommittee on Energy and Power, Committee on Energy and Commerce, U.S. House of Representatives cites extensively the QER on the issue of SPR Modernization.

> In response to these changing dynamics, the Department has initiated work on a comprehensive long-term strategic review of the SPR. The review will examine future SPR requirements regarding the size, composition, and geographic location of the Reserve; and determine the impact of these requirements on future SPR surface, below-ground, and distribution infrastructure. This review will be informed by the recommendations contained in final review reports on the SPR conducted by the Government Accountability Office (GAO) and the Department of Energy's Inspector General (IG) Office. It will also be informed by the recommendations contained in the Administration's recently-released Quadrennial Energy Review (QER). Analytical methodology will be consistent with the requirements of OMB Circular A-94.

The attachment to this report contains the corrective action plan summary for this FY 2015 identified Reportable Condition and updated corrective action plan summary charts for the two reportable conditions of non-financial internal controls that were identified in the FY 2013 Assurance Memorandum.

OMB Circular A-123, Appendix A – Internal Controls Over Financial Reporting

Additionally, in accordance with OMB Circular A-123, Appendix A, the management of SPRPMO is responsible for establishing and maintaining adequate internal control over financial reporting for any site(s) under our cognizance. My office has completed its evaluation of internal controls over financial reporting, which includes safeguarding of assets and compliance with applicable laws and regulations, as required by OMB Circular A-123, Appendix A, and Departmental requirements. This assessment covers the SPRPMO as well as the following federal or contractor sites under our cognizance: Fluor Federal Petroleum Operations, LLC.

Based on the results of the evaluation, I am providing reasonable assurance that internal controls over financial reporting, as of June 30, 2015, were working effectively. This assurance includes a consideration of non-financial controls, which help ensure accurate and timely financial reporting; it also includes consideration of the results of previous tests of controls.

ATTACHMENT (Page 1 of 3)
FY 2015 Corrective Action Plan Summary for
The Strategic Petroleum Reserve Project Management Office

New Corrective Action Plan for FY 2015 Assurance Memorandum	
Title	**SPR Infrastructure Sustainability**
Assurance	Entity Assurance
Type	Reportable Condition
Status[1]	(b) (5)

[1] In this field (STATUS), describe the current status of remediation activities and any planned remediation activities for the following fiscal year. Also note if the CAP has been closed.

ATTACHMENT (Page 2 of 3)
FY 2015 Corrective Action Plan Summary for
The Strategic Petroleum Reserve Project Management Office

Corrective Action Plans Reported in Prior Assurance Memoranda	
Title	**Cavern Well Casing Remediation**
Assurance	Entity Assurance
Type	Reportable Condition
Status[1]	**CASING CALIPER SURVEYS** **FY 2015** As of the end of the 3rd quarter FY 2015, Casing Caliper Surveys of 114 wells have been completed. (Includes one survey completed in FY 2015.) Two surveys remain in each of FY 2015 and FY 2016. **Casing Caliper Surveys Planned/Budgeted: 3** **Casing Caliper Surveys Completed: 1** **FY 2016** **Casing Caliper Surveys Planned/Budgeted: 2** **WELL CASING REMEDIATIONS** **FY 2015** As of the end of the 3rd quarter FY 2015, eighteen well casings that had been determined as needing remediation have been remediated. In FY 2015, three of the six cavern well remediations budgeted have been completed. **Well Casing Remediations Planned/Budgeted: 6** **Well Casing Remediations Completed: 3** **FY 2016** **Well Casing Remediations Planned/Budgeted: 6**

[1] In this field (STATUS), describe the current status of remediation activities and any planned remediation activities for the following fiscal year. Also note if the CAP has been closed.

ATTACHMENT (Page 3 of 3)

FY 2015 Corrective Action Plan Summary for
The Strategic Petroleum Reserve Project Management Office

Corrective Action Plans Reported in Prior Assurance Memoranda	
Title	**Capacity Maintenance**
Assurance	Entity Assurance
Type	Reportable Condition
Status[1]	(b) (5)

[1] In this field (STATUS), describe the current status of remediation activities and any planned remediation activities for the following fiscal year. Also note if the CAP has been closed.

From: Reynolds, Charlene
To: Johnson; David
Cc: Gibson; William
Subject: Cavern Talking Points
Date: Monday, August 20, 2012 12:21:17 PM

Morning Dave,�In light of the Napoleonville sinkhole, we have put together these ?Cavern Talking Points? should we need to speak to our cavern monitoring programs and the numerous measures we employ to ensure the integrity of the caverns.?Thanks.Charlene R.??SPR CAVERN TALKING POINTS ?????????? SPR maintains an extensive cavern monitoring program on 62 storage caverns and 120 wells?????????? Subsidence monitoring program is in place requiring annual surveys at each site and quarterly surveys in area of Bryan Mound Cavern 3; Surveys are obtained by DM and sent to Sandia for tracking and updating subsidence history of each site?????????? Continuous pressure monitoring system is in place to ensure the integrity of the oil storage, to identify sudden changes in cavern pressure, and identify changes in long-term pressurization behavior; continuous coverage includes alarms that signal pressure deviations ?????????? Compliance with all state regulations under Louisiana State Wide Order 29M and Railroad Commission of Texas Rule 95.?????????? Sonar surveys obtained at least every 10 years to measure physical parameters of the caverns geometry via a 3-D visualization of cavern?????????? Sandia National Laboratories world renown salt dome experts contracted with for the past 30 years ?????????? Mechanical Integrity Tests obtained every five-years to assure integrity of the down-hole casing, tubing and wellhead systems and no fluid movement through vertical channels adjacent to the well bore?????????? Oil Brine Interface Surveys conducted biannually to detect changes in oil-brine interface and to verify oil inventory volumes? ?????????? Wireline Temperature Surveys conducted biannually to measure effects of temperature changes on interface depths ?????????? Cavern samples taken periodically and analyzed to assure crude oil quality?????????? Cemented Casing Caliper Surveys provides casing condition analysis and required by state every 10 years?????????? Ullage Management Plan is in place to generate additional cavern space lost due to cavern creep?????????? Caveman Program is a computer program utilizing cavern pressure/temperature histories to detect anomalous cavern well behavior?????????? Crude Oil Cavern Remediation Program is in place to repair wells based on results of down-hole cemented casing caliper surveys?????????? BC Cavern 20 had leached to within 60 feet of the side of the dome which posed a risk of oil leaking outside the dome; steps taken to reduce the amount of oil in the cavern and replace with a new cavern by the end of 2012?????????? Weeks Island salt dome oil storage decommissioned after geological problems detected from development of sinkhole in November 1999?????????? Caverns acquired at Bryan Mound (1 cavern), BC (8 caverns), and WH (2 caverns) were never certified because of geo-technical issues?????????? West Hackberry Cavern Well 6C remediation work-over to repair the inner-most cemented casing string disclosed other concerns; deviation approved for temporary plug of this well and re-configuration of wellhead piping to maintain drawdown capability of Cavern 6???

From: Johnson, David
To: Greenhalgh; Diana
Subject: FW: Cavern Talking Points

��From: Reynolds, Charlene Sent: Monday, August 20, 2012 4:00 PMTo: Johnson, DavidSubject: FW: Cavern Talking PointsImportance: High�Changed the number of caverns to 63 to account for BC 20 and 102.�From: Reynolds, Charlene Sent: Monday, August 20, 2012 11:21 AMTo: Johnson, David (HQ)Cc: Gibson, HootSubject: Cavern Talking PointsImportance: High�Morning Dave,�In light of the Napoleonville sinkhole, we have put together these �Cavern Talking Points� should we need to speak to our cavern monitoring programs and the numerous measures we employ to ensure the integrity of the caverns.�Thanks.Charlene R.��SPR CAVERN TALKING POINTS ��������� SPR maintains an extensive cavern monitoring program on 63 storage caverns and 120 wells��������� Subsidence monitoring program is in place requiring annual surveys at each site and quarterly surveys in area of Bryan Mound Cavern 3; Surveys are obtained by DM and sent to Sandia for tracking and updating subsidence history of each site��������� Continuous pressure monitoring system is in place to ensure the integrity of the oil storage, to identify sudden changes in cavern pressure, and identify changes in long-term pressurization behavior; continuous coverage includes alarms that signal pressure deviations ��������� Compliance with all state regulations under Louisiana State Wide Order 29M and Railroad Commission of Texas Rule 95.��������� Sonar surveys obtained at least every 10 years to measure physical parameters of the caverns geometry via a 3-D visualization of cavern��������� Sandia National Laboratories world renown salt dome experts contracted with for the past 30 years ��������� Mechanical Integrity Tests obtained every five-years to assure integrity of the down-hole casing, tubing and wellhead systems and no fluid movement through vertical channels adjacent to the well bore��������� Oil Brine Interface Surveys conducted biannually to detect changes in oil-brine interface and to verify oil inventory volumes� ��������� Wireline Temperature Surveys conducted biannually to measure effects of temperature changes on interface depths ��������� Cavern samples taken periodically and analyzed to assure crude oil quality��������� Cemented Casing Caliper Surveys provides casing condition analysis and required by state every 10 years��������� Ullage Management Plan is in place to generate additional cavern space lost due to cavern creep��������� Caveman Program is a computer program utilizing cavern pressure/temperature histories to detect anomalous cavern well behavior��������� Crude Oil Cavern Remediation Program is in place to repair wells based on results of down-hole cemented casing caliper surveys��������� BC Cavern 20 had leached to within 60 feet of the side of the dome which posed a risk of oil leaking outside the dome; steps taken to reduce the amount of oil in the cavern and replace with a new cavern by the end of 2012��������� Weeks Island salt dome oil storage decommissioned after geological problems detected from development of sinkhole in November 1999��������� Caverns acquired at Bryan Mound (1 cavern), BC (8 caverns), and WH (2 caverns) were never certified because of geo-technical issues��������� West Hackberry Cavern Well 6C remediation work-over to repair the inner-most cemented casing string disclosed other concerns; deviation approved for temporary plug of this well and re-configuration of wellhead piping to maintain drawdown capability of Cavern 6���

From: Johnson, David
To: ra ss; ori
Subject: P J T C have a lot ore

Safe Work PermitsSafe Work Permits are written daily for all work performed on SPR sites. The number of permits varies depending on the workload at a site. These documents are essential to a job and ensure all safety planning and precautions is done prior to the start of a task.SiteF 2010F 2011F 2012Annual AverageBayou Choctaw2,9861,2642, 042,318West Hackberry2,5055,0 13,4483,6 5Big Hill3,4425,5434,5204,502Bryan Mound4,5054,1 53, 614,14 Total13,43816,05314,43314,641 Maintenance DM Maintenance maintains 20,566 equipment locations at the four Operational sites and Stennis. These locations consist of pumps, motors, valves, actuators, piping, buildings, roads, grounds, electrical distribution and instrumentation items. During the past three years, DM Maintenance has performed a total of 0, 22 individual maintenance actions or 23,5 4 annually and sustained a 99 equipment readiness.Work OrdersF 2010F 2011F 2012AverageCorrective Maintenance - Repair of equipment or systems in order to return item to it s full design performance and functionality6,43 6,0865,58 6,03 Preventive Maintenance - Inspection or minor maintenance intended to prevent equipment failures and extend useful life of equipment or systems15,61514,43015,6 315,239Predictive Maintenance - Technologies including Vibration analysis, Lube Oil Analysis, Motor Circuit Evaluation, Sonic and Infrared intended to provide early warnings and trending analysis in order to predict equipment performance degradation before catastrophic failure.2,3182,2992,2 2,298Total24,3 022,81523,53 23,5 4 Cavern Integrity/WorkoversDM Cavern Integrity monitors and maintains 63 solution mined storage caverns with 122 entry wells across the four SPR sites. Requirements for operating and maintaining Solution Mined Hydrocarbon Storage Caverns are driven from RAILROAD COMMISSION OF TE AS OIL AND GAS DIVISION, Rule 3.95 Underground Storage of Liquid or Liquefied Hydrocarbons in Salt Formations and Title 43, NATURAL RESOURCES Part VII. Office of Conservation Injection and Mining Subpart 3. Statewide Order No. 29-M, Chapter 3. Hydrocarbon Storage Wells in Salt Dome Cavities.
ActivityF 2010F 2011F 2012AverageWorkovers692313Remediation/Repair Workovers2564Temperature Logs 41404040Camera passes3613Sonar Data Base 111Multi-arm Caliper Surveys45212530Mechanical Integrity Test (MIT)12141313Interface Logs85829085Sonar Surveys54 6Fluid Density Surveys1443Pressure Monitoring 365 days365 days365 days365 daysManagement of of workover rigs1232 TerminallingTerminalling contains 10 contracts to support the four SPR sites. The contracts provide stand-by/drawdown, Systems Test Exercise (STE), testing and oil distribution capability. Planned for the next 3 fiscal years include:
Activity Requiring Terminal SupportSitesCycleF 2013F 2014Systems Test ExerciseAllAnnual44High Consequence Area pipeline testsBryan Mound (BM) to Jones Creek or BM to Texas City5-year cycle11Quarterly TestingLake Charles Meter StationQuarterly44Stand-by ServicesBig HillMonthly - 2 contracts2424Piggings - Raw Water PipleineBryan Mound, West Hackberry, Big HillAnnual - 2 per r66Brine Flow TestBryan Mound, Big HillAnnual22Total 4141 Quality Assurance DM Quality uses inspections, surveillances, assessments and audits to ensure compliance with OSHA laws, other government regulations, consensus standards, DOE Orders and contract requirements. During the past three years, DM Quality has performed inspections/surveillances/audits of SPR Storage Sites and Suppliers.

Activity	F 2010	F 2011	F 2012	Average
Site Surveillances	61	105	64	65
Supplier Surveillances	104	91	35	91
Site Assessments/Audits	133	138	135	135
Management Assessments	105	105	105	105
Total	39	249	925	524

From: Fried ann, J lio
To: ates; Perr Perr ates ail ho se gov ; a antha elson
Subject: FW: De erred aintenan e d e to nding short all that has res lted in P o erational iss es
tt c me t : elo are e a les o de erred aintenan e d e to nding short all that has res lted in o erational iss es do

Hi Samantha, Hi Perry,

Per your request — some quick facts on SPR and the consequences of deferred maintenance.

Hope you find this helpful. Please feel free to call or follow with additional requests.

Julio

Dr. S. Julio Friedmann

Principal Deputy Assistant Secretary

Office of Fossil Energy

US Dept. of Energy

From: "Elias, Wayne" <Wayne.Elias@hq.doe.gov>
Date: Tuesday, August 25, 2015 at 10:29 AM
To: Mac Environment <julio.friedmann@hq.doe.gov>
Cc: "Corbin, Robert" <Robert.Corbin@hq.doe.gov>, "Hoffman, Rick" <Rick.Hoffman@hq.doe.gov>
Subject: Deferred maintenance due to funding shortfall that has resulted in SPR operational issues

Julio:

Attached is a list, with description, of resent failures at the SPR that has impacted operations. Let me know if you have any questions.

Wayne

From: Friedmann, Julio
Sent: Thursday, August 20, 2015 7:41 AM
To: Corbin, Robert <Robert.Corbin@hq.doe.gov>
Cc: Matarrese, Mark <Mark.Matarrese@hq.doe.gov>; Elias, Wayne <Wayne.Elias@hq.doe.gov>
Subject: Re: Need a POC
Importance: High

Thank you all. Much appreciated.

We've received this request in the context of helping make the case for the FY16 and 17 budget requests. The goal is to show that increased deferred maintenance has a cost, and that regardless of the future role of SPR, the place neeeds to be kept up and function well. The very short write-up (again, only 1-1.5 pages) is to provide concrete examples of the consequences of deferred maintenance catching up with the nation.

Wayne, happy to meet and talk directly today or tomorrow. This really should only take 30-45 minutes to draft.

J

From:"Corbin, Robert" <Robert.Corbin@hq.doe.gov>
Date: Thursday, August 20, 2015 at 7:30 AM
To: Mac Environment <julio.friedmann@hq.doe.gov>
Cc: "Matarrese, Mark" <Mark.Matarrese@hq.doe.gov>, "Elias, Wayne" <Wayne.Elias@hq.doe.gov>
Subject: RE: Need a POC

Julio,

Good morning. The SPR office will take this for action – Mark M., please stand down.

In order to craft this properly and put things in context, It would be helpful to know what the objective of this tasking is, who the target audience is, and what is the message we are trying to get across.

Wayne Elias, my Director of Engineering, will be acting for me tomorrow (b) (6) and next week (on travel). He will serve as the office POC. Thanks.

Bob

From: Fried ann, J lio
Se t: Wednesda , g st , : P
To: atarrese, ark
c: Cor in, o ert
Subject: eed a P C

Hi Mark, Hi Bob,

Before you both (b) (6), I need something by early next week: specifically, a 1-1.5 page doc with a 1-2 paragraph description of the four recent infrastructure failures at SPR. This would include last week's circulating loop, the internal roof collapse, etc.

Since y'all are about to be out of pocket, please let me know who I should task for this. I really need it to be (a) accurate, (b) short, and (c) objective, just the facts set up.

(b) (6) Please let me know who to reach out to.

J

Below are examples of deferred maintenance due to funding shortfall that has resulted in SPR operational issues.

CONVERT CRUDE OIL TANK Bryan Mound Tank-2 to an external floating roof tank
Past tank inspections indicated that the internal floating roof may be hanging up on some of the external roof support legs. This had resulted in oil getting on top of the floating roof structure which can eventually cause an internal roof failure. The tank was taken out of service and programed for converting to an external floating roof tank to include a new fire protection foam system in the FY 2010 budget submission for award in FY 2012 at an estimated cost of $4,786,300. Each year after the FY 2010 budget submission this activity was rescheduled to be completed in a later year due to funding shortfall. The activity was funded FY 2015. With BMT-2 out of service the BM site draw down rate has been negatively impacted, reduced, by 125,000 barrels per day.

CLEAN AND INSPECT CRUDE OIL TANK Bryan Mound Tank-4
Bryan Mound Tank-4 was programed for cleaning and inspection per API-STD 653, API STD 2015 AND API RP 2016 in the FY 2010 budget submission for award in FY 2014 at an estimated cost of $721,812. Each year after the FY 2010 budget submission this activity was rescheduled to be completed in a later year due to funding shortfall. The FY 2016 budget submission programmed this activity for 2018. BMT-4 experienced an internal roof failure during fill operations in FY 2015. Now two of three tanks are out of service at Bryan Mound. If the remaining tank were to fail, there would be a loss of a 400,000 barrel per day in marine distribution capability to Seaway Freeport docks.

REPLACE PIPING HEADERS AT RWIS AND RWIP SYSTEMS at Bryan Mound
Piping in these areas was programmed to be replaced in the FY 2014 budget submission for award in FY 2014 at an estimated cost of $900,000. Funding short fall caused this activity to be reprogrammed for FY 2015. These piping systems experienced high corrosion rates that was causing several leaks. Patches and sleeves were installed to keep the system in service, but this piping needs to be replaced in order to avoid additional failures. Ultrasonic Test (UT) readings indicated that there was heavy generalized corrosion and severe corrosion/erosion in the piping systems. The SPR found it necessary to replace the piping in FY 2015 due to the high number of leaks at a cost of $1,285,854.

REPLACE 5KV OUTDOOR BUS DUCTS at Bryan Mound
5KV bus duct five transformer locations was programmed to be replaced in FY 2004 for award in FY 2004 at an estimated cost of $400,000. However, each year after 2004, the replacement was reprogrammed due to funding limitation. In 2009 and 2014, five and ten years after initial programming, transformers had failures. Install new modular, 5 KV, bus duct for the remaining

three transformers is now programmed to be installed in FY 2017, at an estimated cost of $400,000, 13 years after initial programming, between equipment, switchgear and load centers.

REPLACE BRINE DISPOSAL/RECYCLE PIPING IN PUMP AND POND AREA at Bayou Choctaw
The Brine System Upgrades at Bayou Choctaw were originally programmed in FY 2012 for awards beginning in FY 2013. Corrosion and leaks in the current piping system have necessitated lowering the operating pressure of the system; which limits Brine Disposal Flow Rate. Much of this piping would have become obsolete due to work scheduled to be performed in the BC Brine System Upgrades currently in LE-2. However, recent multiple leaks in the piping has necessitated that this piping will have to be replaced in FY 2015 at a cost of $695,000 to continue operating in the current configuration.

REPLACE BRINE DISPOSAL PIPELINE at West Hackberry
This replacement activity was originally programmed in the FY 2013 budget submission for award in FY 2017 at an estimated cost of $9,032,962. The pipeline has experienced leaks at several locations due to failure of the internal high density polyethylene liner (hdpe). The line shall be replaced with a 24-inch cement lined carbon steel line. In the FY 2015 budget submission due to the failure, the task was accelerated to a 2015 Government Furnished Equipment (GFE) award and a FY 2016 installation award. Subsequently due to the BMT-4 roof failure money from the GFE project was diverted to perform the necessary cleaning. The GFE will now be awarded in FY 2016 and the Installation in FY 2017. This will be reflected in the FY 2017 Budget Request. The impact is prolonging risk of failure and/or environmental release.