U.S. DEPARTMENT OF ENERGY
STRATEGIC PETROLEUM RESERVE
PROJECT MANAGEMENT OFFICE
NEW ORLEANS, LOUISIANA

Site Environmental Report For Calendar Year 2005

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

September 26, 2006

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Distribution:

SITE ENVIRONMENTAL REPORT FOR 2005 - STRATEGIC PETROLEUM RESERVE

Enclosed for your information is a copy of the Site Environmental Report for Calendar Year 2005 for the U.S. Department of Energy's Strategic Petroleum Reserve. This report is prepared and published annually for distribution to local, State, and Federal Government agencies, the Congress, the public, and the news media. The report was prepared for the Department of Energy by DynMcDermott Petroleum Operations Company.

To the best of my knowledge, this report accurately summarizes and discusses the results of the 2005 environmental monitoring program.

If you have any questions or desire additional information, please contact William L. Vierling of the Project Management Office Environmental, Safety, Health, and Quality Division at (504) 734-4985.

Sincerely,

William C. Gibson, Jr.
Project Manager

FE-4441:(R. Crist)

Enclosure:
As Stated

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STRATEGIC PETROLEUM RESERVE

SITE ENVIRONMENTAL REPORT

FOR

CALENDAR YEAR 2005

Document No. ASE5400.64B0

Prepared for the U. S. Department of Energy
Strategic Petroleum Reserve Project Management Office
under Contract No. DE-AC96-03PO92207

DynMcDermott Petroleum Operations Company
850 South Clearview Parkway
New Orleans, Louisiana 70123

Malcolm Baldrige National Quality Award 2005 Award Recipient

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QUESTIONNAIRE/READER COMMENT FORM

Please submit your questions/comments on a photocopy of this page and forward it to the following address:

DynMcDermott Petroleum Operations Company
Environmental Department, EF-20
850 South Clearview Parkway
New Orleans, LA 70123

A copy of your comments will be sent to the originator for response.

Date: ________________

Name of Submitter:____

Street or P.O. Box: ____

City/State/Zip code: ____

Organization (if applicable): ____

Comments: ____

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(Attach other sheets as needed)
(for originator's use)

Subject Matter Expert (SME): _________________________ Date: _________

SME's Response:____

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LIST OF EFFECTIVE PAGES

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF FIGURES

LIST OF FIGURES
(continued)

LIST OF TABLES

LIST OF TABLES (continued)

ABBREVIATIONS AND ACRONYMS

ac	acre
A&E	Architect and Engineer
ACI	ASRC Constructors, Inc.
AFFF	aqueous film forming foam
AFV	Alternate Fuel Vehicle
ANAB	ANSI-ASQ National Accreditation Board
ANSI	American National Standards Institute
AP	Affirmative Procurement
APHA	American Public Health Association
ASQ	American Society for Quality
ASRC	Artic Slope Regional Corporation
ASTM	American Society for Testing and Materials
avg	average
bbl	barrel (1 bbl = 42 gallons)
BC	Bayou Choctaw
BDL	below detectable limit
BH	Big Hill
bls	below land surface
BM	Bryan Mound
BOD_5	five day biochemical oxygen demand
°C	degrees Celsius
CAA	Clean Air Act
CAP	corrective action plan

ABBREVIATIONS AND ACRONYMS

CEMP	Code of Environmental Management Principles
CEQ	Council for Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESQG	conditionally exempt small quantity generator
CFS	Cubic feet per second
CFR	Code of Federal Regulations
CO	carbon monoxide
COD	chemical oxygen demand
COE	United States Army Corps of Engineers
CPG	Comprehensive Procurement Guidelines
CQI	Continuous Quality Improvement
CV	coefficient of variation
CWA	Clean Water Act
CY	calendar year
DCS	Distributed Control System
DM	DynMcDermott Petroleum Operations Company
DMR	discharge monitoring report
DO	dissolved oxygen
DOE	United States Department of Energy
DOT	United States Department of Transportation
E2	Energy Efficiency
EA	environmental assessment
EFH	East Fillhole

ABBREVIATIONS AND ACRONYMS

EIQ	emissions inventory questionnaire
EIS	emissions inventory summary
EIS	environmental impact statement
EMP	Environmental Monitoring Plan
EMS	Environmental Management System
EO	executive order
EP	Energy Policy
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Emergency Response Procedure
ERT	emergency response team
ESA	Endangered Species Act
ES&H	Environmental Safety & Health
ESH&Q	Environmental, Safety, Health, and Quality Assurance
FAR	Federal Acquisition Regulations
FFCA	Federal Facilities Compliance Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FRP	Facility Response Plan
ft	feet
ft/yr	feet per year
FTX	Field training exercise
F&WS	United States Fish and Wildlife Service
FY	Fiscal Year

ABBREVIATIONS AND ACRONYMS

GALCOE	U.S. Army Corps of Engineers, Galveston District
GC	gas chromatographic
GLO	General Land Office
gpd	gallons per day
GSA	General Services Administration
GWPMP	Ground Water Protection and Management Plan
HAP	hazardous air pollutant
HVAC	High Ventilation Air Conditioning
HW	hazardous waste
ICW	Intracoastal Waterway
ISM	Integrated Safety Management
ISO	International Organization for Standardization
IR	Infrared
km	kilometers
LA	Louisiana
lab	laboratory
LAC	Louisiana Administrative Code
lbs	pounds
LCMS	Lake Charles Meter Station
LDEQ	Louisiana Department of Environmental Quality
LDHH	Louisiana Department of Health and Hospitals
LELAP	Louisiana Environmental Laboratory Accreditation Program

ABBREVIATIONS AND ACRONYMS

LLEA	local law enforcement agency
LPG	Liquefied Petroleum Gas
LDNR	Louisiana Department of Natural Resources
LPDES	Louisiana Pollutant Discharge Elimination System
LWDPS	Louisiana Water Discharge Permit System
m	meters
m^3	cubic meters
ml	milliters
m/yr	meters per year
max	maximum
mgd	million gallons per day
mg/l	milligrams per liter
mmb	million barrels
MPAR	Maintenance Performance Appraisal Report
m/sec	meters per second
M&O	management & operating
MSDS	Material Safety Data Sheets
MSGP	multi-sector general permit
mt	metric tons
N	North
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NEPA	National Environmental Policy Act

ABBREVIATIONS AND ACRONYMS

NEPT	National Environmental Performance Track
NFRAP	No Further Remedial Action Planned
NHPA	National Historic Preservation Act
NIIMS	National Interagency Incident Management System
NO	New Orleans
NOCOE	U.S. Army Corps of Engineers, New Orleans District
NOEC	No Observed Effect Concentration
NOI	Notice of Intent
NORM	naturally occurring radioactive material
NOV	notice of violation
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List (CERCLA)
NRC	National Response Center
NSR	new source review
NV	not a valid or statistically meaningful number
NWP	nationwide permit
O&G	oil and grease
OPA	Oil Pollution Act of 1990
OSPRA	Oil Spill Prevention and Response Act
OVA	organic vapor analyzer
P2	Pollution Prevention
P2E2	Pollution Prevention Energy Efficiency

ABBREVIATIONS AND ACRONYMS

PCB	polychlorinated biphenyl
PE	performance evaluation
pH	negative logarithm of the hydrogen ion concentration
PM_{10}	particulate matter (less than 10 microns)
PMO	Project Management Office
PPOA	Pollution Prevention Opportunity Assessment
PPP	Pollution Prevention Plan
ppt	parts per thousand
PREP	Preparedness for Response Exercise Program
PSD	prevention of significant deterioration
PSI	Pounds per Square Inch
PVC	Polyvinyl Chloride
QC	quality control
RAB	Registrar Accreditation Board
RCRA	Resource Conservation and Recovery Act
RCT	Railroad Commission of Texas
RECAP	Risk Evaluation Corrective Action Program
ROD	Record of Determination
RWIS	raw water intake structure
S	South
SAL	salinity
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act

ABBREVIATIONS AND ACRONYMS

SEMIS	SPR ES&H Management Information System
SER	Site Environmental Report
SIC	Standard Industrial Classification
SIP	state implementation plan
SO_2	sulfur dioxide
SOC	security operations center
SO_X	Sulfur oxides
SPCC	Spill Prevention Control and Countermeasures
SPR	Strategic Petroleum Reserve
SPRPMO	Strategic Petroleum Reserve Project Management Office
SSni	Screening Standards Non Industrial
SQG	small quantity generator
STP	sewage treatment plant
s.u.	standard units
SW	southwest
TCEQ	Texas Commission on Environmental Quality
TCLP	Toxicity Characteristic Leaching Procedure
TDH&PT	Texas Department of Highways and Public Transportation
TDS	total dissolved solids
TNRCC	Texas Natural Resource Conservation Commission
TOC	total organic carbon
TPDES	Texas Pollution Discharge Elimination System
TPH	Total Petroleum Hydrocarbons

ABBREVIATIONS AND ACRONYMS

TPQ	threshold planning quantity
tpy	tons per year
TRI	Toxic Release Inventory
TSCA	Toxic Substance Control Act
TSD	Treatment Storage Disposal
TSS	total suspended solids
TVP	True Vapor Pressure
TX	Texas
UIC	underground injection control
URS	United Research Services
USCG	United States Coast Guard
UST	underground storage tank
VOC	volatile organic compound
WAD	Work Authorization Directive
VWS	verification well study
W	west
WH	West Hackberry
WILT	Weeks Island Long Term

EXECUTIVE SUMMARY

The purpose of this Site Environmental Report (SER) is to characterize site environmental management performance, confirm compliance with environmental standards and requirements, and highlight significant programs and efforts for the U. S. Department of Energy (DOE) Strategic Petroleum Reserve (SPR). The SER, prepared annually, serves the public by summarizing monitoring data collected to assess how the SPR impacts the environment. The SER provides a balanced synopsis of non-radiological monitoring and regulatory compliance data, affirms that the SPR has been operating within acceptable regulatory limits and promotes pollution prevention, and illustrates the success of SPR efforts toward continual improvement.

Included in this report is a description of each site's environment, an overview of the SPR environmental program, and a recapitulation of special environmental activities and events associated with each SPR site during CY 2005.

There was one reportable brine spill (one hundred and seventy barrels) that occurred at the West Hackberry site and zero reportable oil spills during CY 2005. The long-term trend for oil and brine spills has declined substantially from 27 in 1990 down to one in CY 2005. The spills were reported to the appropriate agencies where applicable and immediately cleaned up with no observed environmental impact.

Concern for the environment is integrated into daily activities through environmental management. In addition, adherence to the requirements of Executive Order 13148 also ensures that a high level environmental stewardship is maintained. The SPR's continuing efforts to improve the quality, cost effectiveness, and seamless integration of environmental awareness and control into all operations are consistent with the SPR Environmental Management System and the ISO 14001 standard, as part of a greater Integrated Safety Management System.

The SPR management and operating contractor's environmental management system (EMS) has been certified by a third party registrar against the international ISO 14001 standard since May 2000, and the DOE Environmental Management System was self-certified in 2005. The SPR is a charter member of the EPA National Environmental Performance Track (NEPT) program and in CY 2005 completed the second year of its second three-year membership in the program. The Big Hill and Bryan Mound sites were also selected by the Texas Commission on Environmental Quality as the first Platinum Level members of their Clean Texas program. Both programs recognize and reward facilities that have environmental management systems and manage beyond regulatory requirements.

The SPR sites were inspected or visited on fifteen occasions by outside regulatory agencies or third party auditors during CY 2005. There were no minor findings associated with these inspections. One minor noncompliance that occurred at Bayou Choctaw was self-reported under state and federal discharge permits for all SPR sites during CY 2005, and no Clean Air Act, Clean Water Act or RCRA Notice of Violations (NOV) were received.

During CY 2005 the SPR facilities in Louisiana and Mississippi continued to operate as Conditionally Exempt Small Quantity Generators (CESQG). The two Texas sites briefly operated as Small Quantity Generators (SQG) for one month and immediately returned to CESQG status. The SPR is not a hazardous waste treatment, storage, or disposal (TSD) facility. Superfund Amendments and Reauthorization Act (SARA) Title III, Tier Two, reports are prepared and submitted to agencies every year detailing the kinds and amounts of hazardous substances on SPR facilities. The submittal of a (TRI) Form R was required in CY 2005 because the SPR introduced crude oil into commerce due to the Hurricane Ivan Exchange in CY 2004.

The SPR facilities operate under the National Pollutant Discharge Elimination System (NPDES). The Louisiana Department of Environmental Quality (LDEQ) has primacy for the Louisiana NPDES program (LPDES) while the Railroad Commission of Texas

(RCT), which has SPR jurisdiction in Texas, does not. Consequently, at this time, there is a dual federal and state discharge program only at the Texas sites. Also, each SPR site operates in accordance with a Pollution Prevention Plan prepared in accordance with a separately issued general permit for storm water associated with industrial activity.
The air quality programs at the SPR facilities are regulated by LDEQ and TCEQ for the Louisiana and Texas sites respectively. The effluent monitoring of hazardous and non-hazardous air pollutants at the SPR indicated that all the sites operated in accordance with air quality regulatory requirements during CY 2005.

The SPR met its drill and exercise requirements for CY 2005 under the Oil Pollution Act of 1990 (OPA) through the National Preparedness for Response Exercise Program (PREP).

Environmental compliance and management audits were conducted in-house and by outside entities. DOE Strategic Petroleum Reserve Project Management Office (SPRPMO) appraisal teams conducted formal annual appraisals at the New Orleans Headquarters and the Bayou Choctaw, Big Hill, and West Hackberry sites, meeting with Management and Operations (M&O) and construction contractor management staff, reviewing environmental practices and performance indicators, environmental management systems, and reviewing findings with contractor staff. During FY 2005 there were ten low risk environmental findings associated with the DOE SPRPMO audits. Internal M&O contractor environmental assessments at the five SPR sites during FY 2005 identified no high or medium risk environmental findings and 22 low risk environmental findings. Table 2-8 in Section 2 of this report provides a tabulation of the M&O environmental assessments. Twice during FY 2005, Advanced Waste Management Systems, a third party registrar, Inc., audited the DynMcDermott Petroleum Operations Company (DM) EMS against the ISO 14001 standard. Two minor non-conformances were found. Surveillance Audits are conducted by the registrar every six months. Of the total 35 findings, only one of the findings - soil erosion and saline run-off from the capped south anhydrite pond at West Hackberry - identified environmental degradation.

The SER also characterizes environmental management performance and programs pertinent to the SPR. The active permits and the results of the environmental monitoring program (i.e., air, surface water, ground water, and water discharges) are discussed within each section by site. The quality assurance program utilized at the SPR is presented and includes results from laboratory and field audits and studies performed internally and by regulatory agencies. Internal DOE on-site management appraisals were performed in compliance with the SPRPMO Order 220.1, and criterion 10 of DOE Order 414.1C., DM's internal assessments were conducted in accordance with instruction, Organizational and Management Assessment (NOI1000.72). This characterization, discussion, and presentation illustrate the SPR's environmental performance measures program.

The Questionnaire/Reader Comment Form located inside the front cover of this document may be utilized to submit questions or comments to the originator for response.

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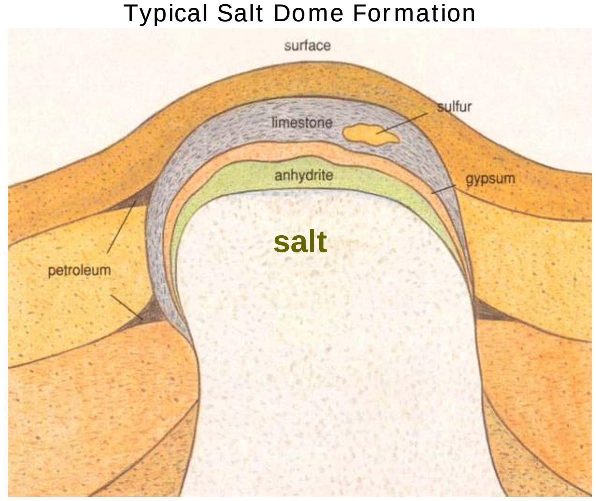
1. INTRODUCTION

As required by DOE Order 231.1A, the purpose of this Site Environmental Report (SER) is to present a summary of environmental data gathered at or near Strategic Petroleum Reserve (SPR) sites to characterize site environmental management performance, confirm compliance with environmental standards and requirements, assure protection of the public, and highlight significant programs and efforts.

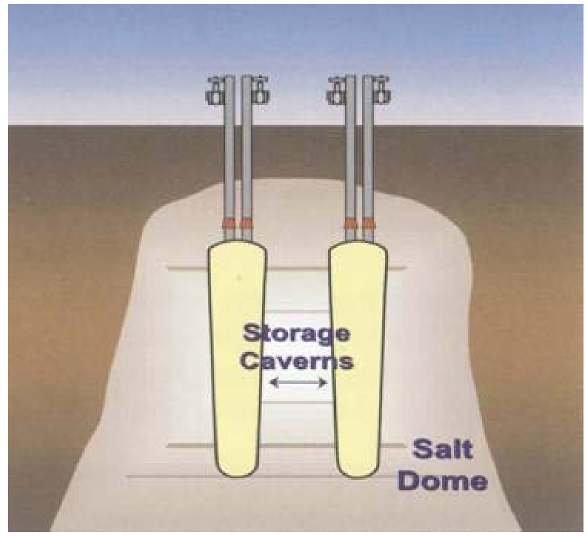
The creation of the SPR was mandated by Congress in Title I, Part B, of the Energy Policy and Conservation Act (P.L. 94-163), of December 22, 1975. The SPR provides the United States with sufficient petroleum reserves to mitigate the effects of a significant oil supply interruption.

Emergency crude oil supplies are stored by the Strategic Petroleum Reserve in salt caverns. The caverns were created deep within the massive salt deposits that underlie most of the Texas and Louisiana coastline. The caverns were created through the process of solution mining.

Typical Salt Dome Formation



Not to Scale



The utilization of the caverns to store crude oil provides assurance against normal hazards associated with the above ground storage, offers the best security, and is the most affordable means of storage. The cost of using caverns to store crude oil is up to 10 times less than aboveground tanks and 20 times less than hard rock mines.

Storage locations along the Gulf Coast were selected because of the combination of a preponderance of salt domes and proximity to a key portion of the Nation's commercial oil transport network in the region. Strategic Reserve oil can be distributed through interstate pipelines to nearly half of the Nation's oil refineries or loaded into ships or barges for transport to other refineries. By the end of 2005, the SPR consisted of four Gulf Coast underground salt dome oil storage facilities (two in Louisiana and two in Texas), two warehouse facilities (one in Louisiana and one in Mississippi), and a project management facility (in Louisiana). A fifth site, Weeks Island in Iberia Parish, LA, was decommissioned in November 1999 and a sixth site, St. James Terminal in St. James Parish, LA was leased to Shell Pipeline in January 1997. Although these sites are no longer SPR active storage facilities, environmental surveillance activities continue; therefore, the sites are addressed in this report.

Due to the location of the SPR crude oil storage sites near marsh or wetland areas, protection of the environment through oil spill prevention and control is a primary commitment. Each SPR site has structures in place to contain or divert any harmful release that could impact surrounding waterways or land areas. Onsite spill control equipment, detailed emergency plans, and extensive training are used to ensure that the environment is safeguarded.

At year’s end, the SPR employed approximately 700 government and contractor personnel, excluding subcontract maintenance and construction personnel.

1.1 BAYOU CHOCTAW

The Strategic Petroleum Reserve (SPR) Bayou Choctaw storage facility is located in Iberville Parish, Louisiana. The storage facility occupies 356 acres.

The Bayou Choctaw salt dome was selected as a storage site early in the SPR program due to its existing brine caverns, which could be readily converted to oil storage and its proximity to commercial marine and pipeline crude oil distribution facilities. Development of the site was initiated in 1977 and completed in 1991. Small canals and bayous flow through the site area and join larger bodies of water off-site.

The area surrounding the site is a freshwater swamp, which includes substantial stands of bottomland hardwoods with interconnecting waterways. The site proper is normally dry and protected from spring flooding by the site's flood control levees and pumps. The surrounding forest and swamp provides habitat for a diverse wildlife population, including many kinds of birds and mammals such as raccoon and deer, and reptiles including the American alligator.

1.2 BIG HILL

The Strategic Petroleum Reserve (SPR) Big Hill storage facility is located in Jefferson County, Texas. The storage site covers approximately 270 acres over the Big Hill salt dome.

The Big Hill storage facility is the SPR's most recently constructed storage facility and is located close to commercial marine and pipeline crude oil distribution facilities. Development of the site was initiated in 1982 and completed in 1991.

Most of the site is upland habitat, consisting of tall grass. A few 150-year-old live oak trees are present on the site. Identified bird concentrations and rookeries are located in the area of the site.

No rare, threatened, or endangered species habitat has been identified in the vicinity of the Big Hill site. Wildlife in the area includes coyote, rabbits, raccoon, and many bird species. The nearby ponds and marsh provide excellent habitat for the American alligator and over-wintering waterfowl.

1.3 BRYAN MOUND

The Strategic Petroleum Reserve (SPR) Bryan Mound storage facility is located in Brazoria County, Texas. The storage facility occupies 500 acres, which almost encompasses the entire Bryan Mound salt dome.

The Bryan Mound salt dome was selected as a storage site early in the SPR program due to its existing brine caverns, which could be readily converted to oil storage, and its proximity to commercial marine and pipeline crude oil distribution facilities. Development of the site was initiated in 1977 and completed in 1987.

The marsh and prairie areas surrounding Bryan Mound are typical of those found throughout this region of the Texas Gulf Coast. Brackish marshland dominates the low-lying portions of the site. The coastal prairie is covered with tall grass forming a cover for wildlife. Water bodies surrounding the site provide a diverse ecosystem. Marshes and tidal pools are ideal habitats for a variety of birds, aquatic life, and mammals. Migratory waterfowl as well as nutria, raccoon, skunks, rattlesnakes, turtles, and frogs can be found on and in the area surrounding Bryan Mound.

1.4 WEEKS ISLAND

The Weeks Island facility located in Iberia Parish, Louisiana, was decommissioned in 1999 and long-term groundwater monitoring was suspended at the end of CY 2004, pending the October 2005 concurrence by LDNR that post closure monitoring had been successfully completed.

While the review period was underway by the Office of Conservation of all of the monitoring conducted in the five-year post-closure period, the SPRPMO completed and finalized the transfer of the remaining surface facilities to the General Services Administration (GSA) of the federal government for their final disposition.

The area surrounding the island is a combination of marsh, bayous, manmade canals, and bays, contiguous with the Gulf of Mexico, that provide a vast estuarine nursery ground for an array of commercially and recreationally important finfish and shellfish.

The vegetation communities on Weeks Island are diverse. Lowland hardwood species proliferate in the very fertile loam soil common at the higher elevations. The predominant tree species are oak, magnolia, and hickory, and extend down to the surrounding marsh. Pecan trees are also present. Gulls, terns, herons, and egrets are common in the marsh area.

Mink, nutria, river otter, and raccoon are the most common inhabitants of the intermediate marshes. Other mammals found at Weeks Island are opossum, bats, squirrels, swamp rabbit, bobcat, white-tailed deer, and coyote. Weeks Island is the home of one of the densest breeding populations of the Louisiana black bear, which has been listed as a threatened species by the U.S. Fish and Wildlife Service (F&WS) under authority of the Endangered Species Act (ESA).

Weeks Island and the surrounding wetlands are also frequented by a variety of endangered or threatened avian species, including the brown pelican, bald eagle, peregrine falcon, the piping plover, and least tern. The wetlands to the southwest of Weeks Island are a breeding area for least terns. The American alligator occurs in the marshes adjacent to the site.

1.5 WEST HACKBERRY

The Strategic Petroleum Reserve (SPR) West Hackberry storage facility is located in Cameron Parish, Louisiana. The storage site covers approximately 565 acres on top of the West Hackberry salt dome.

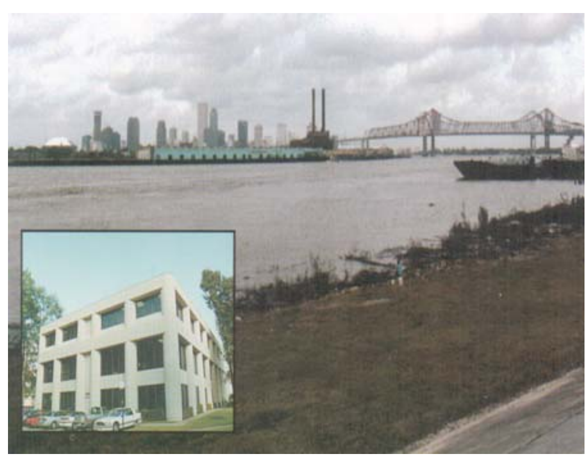
The West Hackberry salt dome was selected as a storage site early in the SPR program due to its existing brine caverns, which could be readily converted to oil storage and its proximity to commercial marine and pipeline crude oil distribution facilities. Development of the site was initiated in 1977 and completed in 1988.

Numerous canals and natural waterways bisect the area. The surrounding area consists of marshland with natural ridges. These ridges, called cheniers, typically support grass and trees and affect water flow through the marshes. In many areas, lakes, bayous, and canals are concentrated so that the marsh may not seem to be a landmass, but rather a large region of small islands.

The marshlands surrounding the West Hackberry site provide excellent habitat for a variety of wetland species. Many bird species frequent the area, including southern bald eagle, Arctic peregrine falcon, brown pelicans, and waterfowl. Other inhabitants include red fox, raccoon, nutria, opossum, wolf, bobcat, rabbits, and white-tailed deer. The American alligator is extremely common, breeding and nesting in this area. The marsh also supports a variety of other reptiles, fish, shellfish, and mammals.

1.6 SPR HEADQUARTERS

The project management office for SPR operations is housed in two adjacent office buildings and a nearby warehouse in Harahan, Louisiana, part of the New Orleans metropolitan area. This facility is the main office through which DynMcDermott manages, operates, maintains and supports the crude oil reserve sites. Activities conducted at the New Orleans office complex are predominantly administrative



with nearby warehouse capacity to augment project-wide equipment storage. Office and warehouse space is leased, not owned, by the Department of Energy.

1.7 STENNIS WAREHOUSE

The Stennis Warehouse facility is located in Hancock County, Mississippi. The warehouse, and adjacent concrete aprons and parking lot occupy approximately 3.4 acres within the John C. Stennis Space Center. The Space Center is located approximately 8 miles southeast of Picayune, Mississippi. The warehouse has been leased from the U.S. Army since 2004. It is used to maintain and store heavy mobile equipment (including diesel pumps and related piping and connections), and other large pieces of equipment for the four storage sites. It also has office space permanently used by its tenants and, if needed, temporarily used by headquarters personnel.

The warehouse is one of many other large buildings and structures within the 139,000 acre Space Center. Most of the Space Center property remains undeveloped pine and hardwood forests, grasslands, bogs, and marshes. The area immediately around the warehouse is either concrete or grass. Stormwater ditches border the east and south sides of the property and flow into larger swales to the north and west of the building. A pine forest community with hardwood and brushy understory abut the north and west sides of the property but rapidly transitions to wetlands. Roadways and parking areas of adjacent facilities border the south and east sides of the warehouse. The forest and swales provide habitat for a diverse wildlife population, including many kinds of birds, mammals such as rabbit, raccoon, and deer, and reptiles such as snakes, alligators, lizards, and turtles.

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2. COMPLIANCE SUMMARY

General

The SPR operates in conformance with standards established by federal, state, and local statutes and regulations, Executive Orders, and Department of Energy (DOE) orders and directives. A list of environmental federal, state, and many of the DOE standards that, in varying degrees, affect the SPR is provided in Appendix A.

The DOE Office of Deputy Assistant Secretary for the Petroleum Reserves has overall programmatic responsibility for establishing the objectives of the SPR. The SPRPMO Project Manager is responsible for implementing these goals and objectives including articulating an Environmental Policy statement that is responsive to Departmental requirements. The DOE policy is applied to SPR operations through the current M&O contractor's Environmental Policy (Appendix B.)

The SPR has had an Environmental Protection Program since its inception and initial operation in 1978. The SPRPMO has assigned contractual responsibilities for implementation of the program to the current Management & Operating (M&O) contractor, DynMcDermott Petroleum Operations Company (DM). Additional responsibilities, as applicable, are assigned to the Architect-Engineering (A&E) contractor, URS Group, Inc., the Construction Management services contractor, Arctic Slope Regional Corporation Constructors, Inc. (ACI), and SPR subcontractors. DM has been under contract to DOE since April 1, 1993.

The SPRPMO Environmental, Safety, Health, and Quality Assurance (ESH&Q) division is responsible for development and oversight of ES&H programs and provides direction, technical guidance, and independent oversight to its prime contractors in the implementation of environmental programs and assessment of contractor performance.

It is the SPR's policy and practice to conduct operations in compliance with all applicable environmental requirements with the highest regard for protection and preservation of the environment. Compliance status in this year's report reflects compliance activities conducted by DOE and DM personnel.

To illustrate its commitment to excellence with regard to environmental management, DM also operates with an EMS that is certified against the ISO 14001 standard by a third party registrar. This EMS reinforces conformance with DOE Order 450.1, the environmental management requirements of Executive Order 13148, and strengthens the environmental leg of the SPR Integrated Safety Management (ISM) system.

A summary of the programs and procedures that presently make up the SPR environmental protection program includes:

a. A NEPA program that provides a comprehensive environmental review of all projects including purchase requisitions, engineering scopes of work, engineering change proposals, design reviews, and design changes for all SPR activities;
b. A wetlands and floodplains management program that addresses projects that have an impact on Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and state coastal zone management programs;
c. inspections, appraisals, assessments, and surveillance which provide regular monitoring to ensure compliance with regulatory and policy requirements;
d. a non-routine reporting program directed toward notification of oil, brine, or hazardous substance spills, or noncompliant effluent emissions, to identify the impact of such spills or emissions on property and the environment, and to comply with regulatory requirements;
e. a routine reporting program directed toward fulfilling self-reporting obligations under water, air, and waste permits and regulations;

f. a permit monitoring program to ensure compliance with all permit requirements and limitations, onsite operations and maintenance activities;

g. an environmental monitoring program to detect any possible influence the SPR might have on surface waters and ground waters on or near SPR sites and to provide a baseline in the event of an environmental upset;

h. discharge procedures used by each site when releasing liquid from any authorized containment or control system;

i. an environmental training program to ensure that applicable personnel are aware of the SPR environmental management system and environmental laws and regulations and proficient in oil and hazardous material spill prevention, and safe handling of hazardous waste;

j. a pollution prevention program which focuses on source reduction, recycling, reuse, affirmative procurement and proper disposal of all wastes produced on the SPR sites;

k. an underground injection control program mandated by the Safe Drinking Water Act (SDWA) to ensure sound operation of Class II underground wells/caverns for brine disposal or hydrocarbon storage to protect aquifers;

l. a regulatory review program for identification of new environmental requirements; and

m. an employee environmental awards program to recognize activities, initiatives, and innovative approaches for improved environmental management and pollution prevention;

Regulatory

The principal agencies responsible for enforcing environmental regulations at SPR facilities are the Environmental Protection Agency (EPA) Region VI, the New Orleans and Galveston Districts of the U.S. Army Corps of Engineers (COE), the Louisiana Department of Environmental Quality (LDEQ), the Louisiana Department of Natural Resources (LDNR), the Railroad Commission of Texas (RCT), the Texas Commission on Environmental Quality (TCEQ), and the Texas General Land Office (GLO). These agencies issue permits, review compliance reports, inspect site operations, and oversee compliance with regulations.

Executive Orders (E.O.)

The SPR follows and operates in conformance with numerous Executive Orders applicable to its operation. Five of the previously existing major orders are Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition (E.O. 13101), Greening the Government Through Efficient Energy Management (E.O. 13123), Developing and Promoting Bio-based Products and Bio-energy (E. O. 13134), Greening the Government Through Leadership in Environmental Management (E.O. 13148), and Greening the Government Through Federal Fleet and Transportation Efficiency (E.O. 13149).

The SPR has responded to these associated DOE guidance and implementation memoranda through several initiatives. One of these is the organization of the DM Environmental Department to increase efficiency and place added emphasis on key program areas. Job tasks are arranged into the functions of Chemical Management, NEPA and Air Quality, Waste Management, Surface and Ground Water, Environmental Management Systems, Pollution Prevention, and Environmental Compliance.

DOE environmental staff includes a NEPA Compliance Officer, who also has responsibility for Pollution Prevention / Waste Management, and an Environmental Program Manager, whose responsibilities include Air Quality, Surface and Ground Water, and Environmental Management Systems.

The SPR follows and operates in conformance with numerous DOE Orders applicable to its operation. Two of the major orders include General Environmental Protection Program (450.1) and National Environmental Policy Act (NEPA) Compliance Program (451.1B). The orders establish some of the policies of the SPRPMO that help to ensure environmental stewardship is maintained.

2.1 COMPLIANCE STATUS (JAN. 1, 2005 THROUGH DEC. 31, 2005)

A major component of the SPR's compliance program is associated with meeting regulations under the Clean Water Act. At the beginning of the year, the SPR sites had a total of ninety five wastewater and stormwater discharge monitoring stations that remained unchanged during this period, and 35 active wetland permits authorizing various structures at each of the sites.

The SPR is also required to meet many requirements under the Clean Air Act and the Safe Drinking Water Act and conduct waste management activities in accordance with the Resource Conservation and Recovery Act (RCRA) and state guidelines.

The following sections highlight primary compliance activities at the SPR sites by environmental statute.

Clean Water Act (CWA)

The SPR sites comply with the CWA through permitting under the National Pollution Discharge Elimination System (NPDES) program, following the spill prevention control and countermeasures (SPCC) regulations, complying with the requirements of the Oil Pollution Act of 1990 (OPA), and complying with the wetlands usage program.

During 2005 the SPR self reported one minor noncompliance with state and federal water discharge permits to regulatory agencies under the permit self-reporting provisions. This noncompliance is discussed further in Sections 2.3 and 5.4.

In 2004, the SPR requested minor modifications to both of the Texas site general NPDES permits to increase the nozzle exit velocity from the assigned 20 fps to 30 fps in order to promote increased dispersion of offshore brine discharge further retiring potential impacts. These modification requests were granted effective February, 2006. Louisiana has primary enforcement responsibility for the NPDES discharge program, issuing permits under the Clean Water Act. LDEQ was in the process of writing a renew permit for the Bayou Choctaw facility late in the calendar year 2005.

The SPR maintains a Louisiana statewide permit from LDEQ for discharge of hydrostatic test water that minimizes permit-filing fees and increases flexibility in support of site construction and maintenance activities.

Each SPR storage site and the Stennis warehouse comply with the Federal Spill, Prevention, Control, and Countermeasures (SPCC) regulations and in Louisiana with the state SPCC regulations by following a plan that addresses prevention and containment of petroleum and hazardous substance spills. All of the SPR spill plans are current in accordance with Title 40 CFR 112 and corresponding state regulations.

The SPR sites obtain permits from the U.S. Army Corps of Engineers and Coastal Zone Management representatives of the responsible state agencies whenever fill, discharge, or dredging occurs in a wetland.

During 2005, SPR projects occurred in jurisdictional wetlands in Louisiana and Texas requiring Corps of Engineers permit actions from the New Orleans and Galveston districts in addition to Coastal Zone Management approval (Department of Natural Resources – Coastal Zone Management in Louisiana and the General Land Office in Texas). Project authorizations resulted from work involving maintenance dredging and spoil placement at the raw water intake structures (RWIS), pipeline or brine disposal line maintenance, relocation of a 34.5kV power line, and also traveling screen removals for repair and associated replacements.

<u>Oil Pollution Act (OPA) of 1990</u>

SPR emergency programs, planning, and management are guided by OPA 90 regulatory standards for onshore storage facilities, pipelines, and marine terminal facilities. SPR site Facility Response Plans (FRP) meet or exceed the requirement of OPA 90 and related state acts such as the Oil Spill Prevention and Response

Act (OSPRA) in Texas. The plans are approved by the appropriate federal and state regulatory agencies, and have been combined with the site emergency response procedures (ERP) in accordance with the EPA one plan scheme. The Texas sites maintain their individual OSPRA certifications in accordance with state requirements.

The SPR conducts emergency drills or hands-on training of its sites each quarter in accordance with the National Preparedness for Response Program (PREP). A professional staff of emergency management exercise personnel from DM New Orleans conducts two equipment deployment exercises at each site annually. The annual site exercises include the participation of public and regulatory/governmental agencies.

The SPR utilizes the National Interagency Incident Management System (NIIMS), the response management system required by the National Oil and Hazardous Substances Pollution Contingency Plan. SPR site and New Orleans response management personnel have been trained in the unified Incident Command System, and a team of selected New Orleans personnel is available to support extended site emergency operations when needed.

Safe Drinking Water Act (SDWA)

The SPR oil storage caverns and brine disposal wells are regulated by the SDWA. The EPA granted primacy under the SDWA to both Louisiana and Texas Underground Injection Control (UIC) programs, which regulate underground hydrocarbon storage, related brine disposal, and oil field wastes. The SPR operates 21 saltwater disposal wells for the Louisiana sites. In Texas, brine is disposed via brine pipelines that extend into the Gulf of Mexico. Some ancillary commercial disposal wells are used occasionally. The 2005 Annual Report Form OR-1 for underground injection was completed and submitted on schedule to the LDNR.

Historic ground water evaluations have indicated the presence of some shallow ground water impacts from salt water at the Bryan Mound and West Hackberry sites. At Bryan Mound, data suggests that use of unlined brine storage pits by the previous industrial tenants may have been a major contributor to the salt impacted ground water located east of the site's closed large brine storage pond.

The West Hackberry site completed closure of its brine ponds under a corrective action plan (CAP) negotiated with LDNR. All remedial recovery pumping was successfully completed in 2001. Post closure monitoring of certain wells for 30 years is currently met by monitoring quarterly and reporting annually in this SER.

In a parallel project, the post-closure monitoring near the Bryan Mound brine storage pond is reported in this report as requested by the RCT.

A program to establish baseline ground water conditions at Weeks Island prior to making post-decommissioning comparisons was conducted from 1996 through 1999 when it was converted to a 5 year post-decommissioning “detection” monitoring program. On May 18, 2005, the SPRPMO petitioned LDNR to “make a determination” that post closure actions had been satisfactory completed. To support this request, a report titled “Final Report on Weeks Island Monitoring - Phase 1999 through 2004”, prepared by contract from Sandia National Laboratories, was provided. LDNR concurred in October issuing a Follow-Up to Supplement of Order SDS-8, accepting decommissioning actions and post decommissioning monitoring as complete and closed. As a result of these actions taken during the year, no direct physical monitoring activities occurred in 2005.

Potable water systems at Bryan Mound, Big Hill, and Bayou Choctaw are classified as “non-transient, non-community public water systems. Big Hill and Bryan Mound distribute purchased treated (chlorinated) surface water received from local purveyors. Bayou Choctaw produces, treats, and distributes groundwater from a well on-site. Local public water systems supply drinking water to the West Hackberry site, New Orleans headquarters, and the New Orleans and Stennis warehouses.

In 2005, drinking water samples were taken monthly at Big Hill and Bryan Mound and quarterly at Bayou Choctaw for total coliform testing by state-approved outside laboratories. On a weekly and daily basis, residual chlorine was monitored at Big Hill and Bayou Choctaw, respectively. Residual chloramine was monitored weekly at Bryan Mound. Potable water at Bryan

Mound and Bayou Choctaw has been tested under state programs for lead and copper repeatedly in previous years (most recently in 2002 and 2004, respectively), and testing was begun at Big Hill in 2005. As a result of test results Bayou Choctaw maintains a program to protect piping from corrosion to help ensure the drinking water lead and copper concentration action thresholds are not exceeded. Annual testing for disinfection by-products continued at Bryan Mound but was increased at Bayou Choctaw. Testing is conducted with state agencies (Louisiana Department of Health and Hospitals and Texas Commission on Environmental Quality, respectively). Concentrations of the two groups of disinfection by-products – trihalomethanes and haloacetic acids – remained below the maximum contaminant levels (MCL) at Bryan Mound in 2005. The MCL of both by-products were exceeded at Bayou Choctaw in 2004, and consequently quarterly sampling was initiated in 2005. The average of the 2005 quarterly test results were below the MCL for both by-products, allowing testing to be reduced back to annual.

Disinfectant by-product testing will begin in 2006 at Big Hill. The disinfectant by-product concentrations in the water purchased by the site exceeded their MCL, and the site was notified by its water purveyor. The purveyor is upgrading the water treatment plant, and the problem is expected to be eliminated in 2006.

Big Hill, Bryan Mound, and Bayou Choctaw calculate maximum residual disinfectant levels (free chlorine at Big Hill and Bayou Choctaw, and chloramine at Bryan Mound), based on a running annual arithmetic average. Calculated results at both sites have not exceeded the regulatory MCL Disinfectants.

Clean Air Act (CAA)

The SPR sites comply with the applicable provisions of the CAA and State Implementation Plans (SIP) through permitting, with the state agencies having primacy (LDEQ and TCEQ), and following applicable regulations. All of the SPR sites are located in attainment areas for all National Ambient Air Quality Standards (NAAQS) pollutants with the exception of ozone. West Hackberry is located in an attainment area for ozone; therefore, the Prevention of Significant Deterioration (PSD) permitting program regulates it. Big Hill, Bryan Mound, and Bayou Choctaw are located in non-attainment areas for ozone; therefore, the New Source Review (NSR) permitting program applies. None of the SPR sites are considered to be major sources during normal operations under PSD, NSR, Title III hazardous air pollutant, or Title V operating permit regulations. All of the facilities operate in accordance with the provisions of the applicable state air permits.

Pollution Prevention Act of 1990 (PPA)

Each SPR site operates in accordance with a Storm Water Pollution Prevention Plan prepared in accordance with the EPA renewed multi-sector general storm water permits and similar Louisiana requirements. This multimedia document consolidates these regulatory agency requirements with the more general DOE Order 450.1 and E.O. 13148, which require a Pollution Prevention Program, and the related Waste Minimization and Solid Waste Management Plans.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

The SPR has not needed to conduct response activities pursuant to this act. DOE Order 5480.14 required all DOE-owned sites to evaluate compliance with CERCLA. The SPR completed DOE Phase I and II reports (similar to CERCLA's Preliminary Assessment and Site Investigation process) in 1986 and 1987, respectively. The reports recommended no further action under CERCLA criteria. The DOE Phase I and II reports were submitted to EPA Region VI, and as a result all SPR sites are considered as No Further Remedial Action Planned (NFRAP) to reflect the findings in the reports.

Resource Conservation and Recovery Act (RCRA)

Hazardous wastes generated on the SPR are managed in strict compliance with state and EPA hazardous waste programs. The EPA has delegated the hazardous waste program to LDEQ in Louisiana and MDEQ in Mississippi. SPR Texas sites fall under the jurisdiction of the RCT, which has not yet received delegation; therefore, the SPR complies with both EPA and RCT regulations in Texas.

Large quantities of hazardous waste are not routinely generated at the SPR and the sites have in the past been typically classified as either Conditionally Exempt Small Quantity Generators (CESQG), or Small Quantity Generators (SQG). Hazardous wastes are not treated, stored, or disposed at the SPR sites and therefore, they are not RCRA-permitted treatment, storage, and disposal (TSD) facilities. Each site has an EPA generator number that is used to track the manifesting of hazardous waste for off-site treatment or disposal. None of the SPR sites are identified on the National Priority Listing (NPL) under CERCLA.

SPR non-hazardous wastes which are associated with underground hydrocarbon storage activities are regulated under the corresponding state programs for managing drilling fluids, produced waters, and other wastes associated with the exploration, development, production or storage of crude oil or natural gas. These wastes are referred to as Exploration and Production (E&P) wastes. Hazardous E&P wastes are exempted from RCRA, but Congress did not include the underground storage of hydrocarbons in the scope of the E&P criteria. However, under LA and TX regulations, underground storage of hydrocarbons is included in the E&P scope. For this reason, in order to remain in compliance with federal law, the SPR does not dispose of hazardous waste under the "E&P" exemption rules. The SPR characterizes all E&P waste streams to determine if they exhibit hazardous characteristics, and any that do are managed and disposed as hazardous waste. The SPR disposes of non-hazardous wastes generated by the E&P process at state approved E&P disposal facilities. During 2005, 99.3 percent of non-hazardous E&P wastes (441 tons) generated on the SPR were recycled.

Other non-hazardous wastes, such as office wastes, are managed in accordance with state solid waste programs. The appropriate waste management strategy is based on the results of waste stream characterization.

During CY 2005, the only hazardous wastes that were shipped from the SPR were fluorescent bulbs from the TX SPR sites.

There were no shipments of hazardous waste from the LA or MS SPR sites. The hazardous waste that was generated consisted primarily of laboratory wastes (generated SPR site-wide), and fluorescent bulbs (generated at SPR Texas sites). During CY 2005, all SPR sites averaged hazardous waste generation rates well within the CESQG limits.

The DOE and M&O contractor's corporate policies stress the SPR's commitment to waste management and environmental protection (Appendix B).

Toxic Substances Control Act (TSCA)

Friable asbestos is not present at SPR sites. Small amounts of nonfriable asbestos usually in the form of seals or gaskets are disposed of locally as they are taken out of service, in accordance with applicable solid waste regulations. Non-asbestos replacement components are used. No liquid-filled electrical equipment or hydraulic equipment currently used on the SPR has been identified as PCB equipment or PCB contaminated under TSCA. Procedures are in place to preclude or prohibit purchase of equipment containing either friable asbestos or PCBs.

National Environmental Policy Act (NEPA)

Approximately 750 documents that included design reviews, engineering change proposals, deviations and waivers, and purchase requisitions were evaluated for NEPA review in 2005. Out of these documents, forty seven required NEPA categorical exclusion documentation. None of the projects associated with these documents had the potential to adversely affect any environmentally or culturally sensitive resources, such as structures of historic, archeological, or architectural significance or any threatened or endangered species or their habitat. Also, no wetlands were adversely impacted as a result of these actions. All of these NEPA reviews resulted in categorical exclusions that did not require further action.

In CY2005, one Environmental Assessment and Finding of No Significant Impact was completed. It was for the West Hackberry SPR site, DOE/SPR/EA-1523, Environmental Assessment to Address Proposed Site Modifications at the Strategic Petroleum Reserve's West Hackberry Raw Water Intake Structure Site, Cameron Parish, Louisiana. In addition, as required by 10 CFR 1022, a Floodplain and Wetlands Assessment was prepared for a security clear zone around the Bayou Choctaw site in CY 2005. No further NEPA actions were required by any of these documents.

DOE Headquarters initiated an Environmental Impact Statement (EIS) in CY 2005 as required by the Energy Policy Act (EPACT) of 2005 in support of site selection to expand the SPR capacity to 1 billion barrels of crude oil. EPACT requires the Site Selection to be completed within one year of the Act's effective date requiring Final EIS DOE/EIS-0385, and Record of Decision (ROD) to be published in CY 2006. The EIS considers the development of one or two new SPR sites from five proposed locations (2 in Mississippi, 2 in Louisiana, and 1 in Texas) and the expansion of 2 or 3 of the existing SPR sites (Bayou Choctaw, Big Hill, and West Hackberry).

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

Much of the SPR property is developed with buildings, piping, cable trays, and other structures where the use of pesticide products is necessary to control unwanted vegetation and other pests. During CY 2005 the SPR continued to use pesticide products to control of vegetation, maintain the security zone areas, and mitigate the reduction of the number of personnel dedicated to mowing.

Endangered Species Act (ESA)

In a continuing effort to minimize disruption and provide suitable habitat to the existing migratory birds at SPR sites, bird-nesting areas are closed or otherwise protected during critical periods to prevent disturbance as a result of site operations. The F&WS is consulted in regard to appropriate actions taken that may affect migratory birds or threatened and endangered species. For example, the F&WS is consulted prior to the removal and relocation of nuisance wildlife.

As part of the conditional coverage obtained through the re-issued Multi Sector General Permit (MSGP), a required signatory on each Notice of Intent (NOI) precipitated a formal review of site-specific potential endangered species impacts. This was accomplished prior to finalizing the NOIs and involved an update/comparison step with original Environmental Impact Statements (EISs), with the current ESA lists, and a generalized evaluation or assessment of any potential impacts relating to or resulting from SPR storm water "sheet flow" run-off. No potential impacts were discerned.

National Historic Preservation Act (NHPA)

No site projects required certified reviews by the Louisiana State Historical Preservation Office in CY 2005. A historic project-wide review step for NHPA to accompany the MSGP Notices of Intent as detailed in the previous ESA section. No places on or eligible to the National Register of Historic Places are located on or adjacent to SPR sites, with the exception of the Bryan Mound SPR site which is located on a Texas State Historical Place for its significance to the sulfur mining industry and long-term development of the nearby town of Freeport. A monument commemorates the historical significance of this location.

Federal Facilities Compliance Act (FFCA)

During CY 2005 none of the SPR sites generated any waste considered to be hazardous and radioactive (mixed waste). Therefore, this act did not apply to the SPR.

Atomic Energy Act of 1954

X-ray and other sealed radioactive sources are used at the SPR to perform analytical, monitoring and scanning activities. Conformance with this act is demonstrated by following state implementing agency radiation control regulations.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds and the Migratory Bird Treaty Act

The active storage facilities comprising the Strategic Petroleum Reserve are located in a variety of environs and migratory pathways along the Gulf Coast of Texas and Louisiana. As such, a variety of waterfowl and other nesting birds frequent our sites during a typical year. Environmental awareness of migratory bird issues commences at the site level. Each site ES&H Manager implements site-wide surveillance, through others as appropriate, in the conduct of normal operations. Selected fields are not mowed from early fall through early spring at Bryan Mound to provide food and shelter for migrating birds. Similarly at the Bayou Choctaw site a feed plot is provided for wintering wildlife. When discovered, nesting areas at all sites are flagged in the field for the nesting season (e.g. Least Terns); and equipment has been designated for limited/restricted use on occasion when they harbor bird nests (e.g. by Mockingbird, Mourning Dove, and Shrike). At the West Hackberry site selected areas are not mowed and/or are posted to avoid from early spring through mid summer to allow bird nesting and brooding. These activities illustrate the coordination maintained with local Fish & Wildlife representatives at the SPR sites in fulfillment of environmental stewardship.

Executive Order (E.O.) 11988 "Floodplain Management"

Since the inception of the SPR, compliance with E.O. 11988 has been maintained by complying with NEPA requirements, identifying potential environmental impacts, and obtaining permits through the COE and state coastal management agencies prior to any construction, maintenance, rehabilitation, or installation of structures and facilities.

Executive Order (E.O.) 11990 "Protection of Wetlands"

The measures that illustrate the SPR compliance with E.O. 11988 are also used to comply with E.O. 11990 and ensure that any practicable steps to minimize harm to wetlands are identified and taken.

Executive Order (E.O.) 13101, "Greening the Government Through Waste Prevention, Recycling and Federal Acquisition"

E.O. 13101 superceded and replaced E.O. 12873, but it retained the intent of the latter and strengthened its implementation through enhanced management requirements. One of the key programs in E.O. 13101 is Affirmative Procurement (AP), the purchasing of EPA-designated items (61 items listed under 8 categories) that contain recovered material. The DOE Affirmative Procurement Program ensures that items composed of recovered materials will be purchased to the maximum extent practicable, consistent with Federal Law and Procurement Regulations (RCRA 6002 and Federal Acquisition Regulations (FAR)).

On May 5, 2005, the Environmental Protection Agency (EPA) final rule took effect amending its Comprehensive Procurement Guidelines (CPGs), designating seven new items to be purchased with recycled content. These items are modular threshold ramps, non-pressure pipe, roofing materials, office furniture, rebuilt vehicular parts, bike racks, and blasting grit. This rule also revised the CPGs for cement/concrete, carpeting, latex paint, retread tires and railroad grade crossing surfaces. It limited specifications/standards for retread tires and latex paint, amended classifications and limited uses for carpeting, and expanded use of recovered materials for railroad grade crossing surfaces and cement/concrete. A requirement that pre-formed concrete/cement products be purchased with recycled content was also added.

The SPR is committed to meeting the Secretary of Energy's goal of achieving 100 percent success in purchasing of AP products, restricting its procurement and tracking processes for purchase of affirmative procurement materials. Including incorporation into construction contracts. Affirmative Procurement success was 100 percent for CY 2005.

<u>Executive Order (E.O.) 13148 "Greening the Government through Leadership in Environmental Management"</u>
On April 21, 2000, E.O. 13148 superseded the pollution control plan requirements of E.O. 12088, "Federal Compliance with Pollution Control Standards". In accordance with all applicable pollution control standards, the SPR complies with E.O. 13148. These requirements were satisfied through implementation of the SPR Pollution Prevention (P2) Plan and the SPRPMO and the O&M contractor's environmental management systems (EMS). The P2 plan references the SPR Pollution Prevention and Energy Efficiency Leadership Goals required by several executive orders and DOE memoranda, which include hazardous and non-hazardous waste reduction. Both EMS's are based on the ISO 14001 Standard, and the O&M contractor's EMS has been certified by a third-party registrar since May 2000.

Between a 1993 baseline of 2.4 mt (2.7 tons) and 2005, the SPR reduced hazardous waste generation by 91 percent, down to 0.22 mt (0.25 tons). Waste streams at the SPR continue to be reduced due to increased awareness, surveillance, management participation, and waste minimization efforts on the part of all SPR employees. Figures 2-1 and 2-2 illustrate FY 2005 monthly waste generation versus the pro-rated fiscal year's target of 539 lbs and the trend of hazardous waste reduction since 1993, respectively.

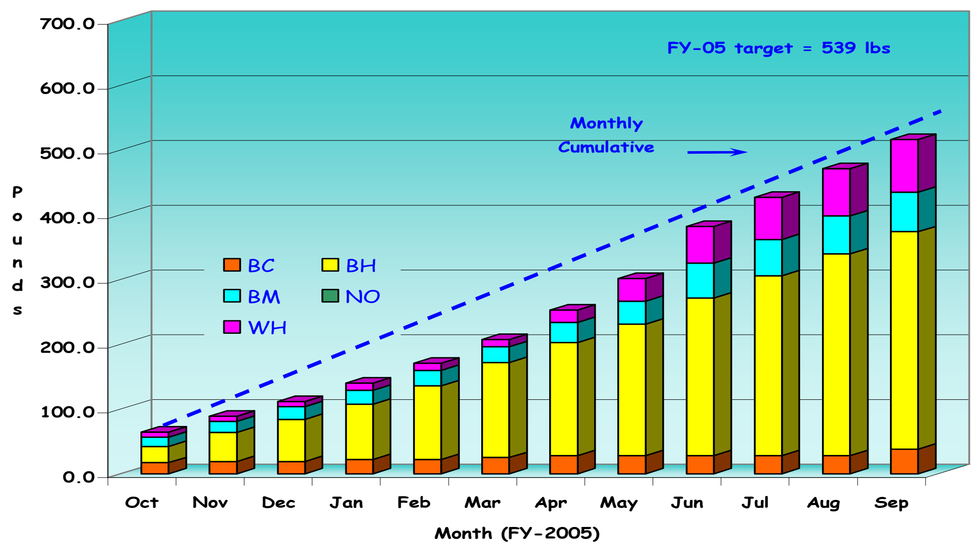


Figure 2-1. FY 2005 Monthly Hazardous Waste Generation

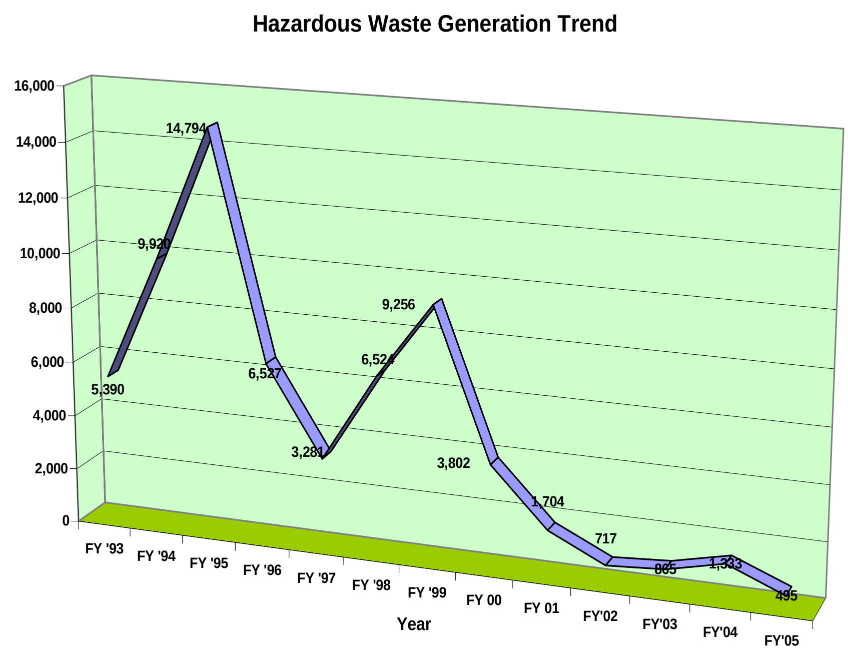


Figure 2-2. SPR Hazardous Waste Generation FY 1993 to FY 2005

The SPR takes an environmental leadership role by striving to eliminate or reduce all SPR waste streams at the source whenever possible. In CY 2005, the SPR recycled 96,165 lbs of paper as compared to 89,151 lbs of paper in 2004. This is indicative of an increased recycling awareness among employees.

E&P wastes can be generated as a result of routine site operations such as pond or tank cleanouts and brine disposal well maintenance operations. In FY 2005, 397 mt (438 tons) of non-hazardous E&P wastes were recycled by use of a production process known as land farming. Another 2.7 mt (3 tons) of E&P waste were disposed. As a result of the SPR's recycling efforts during FY 2005 a recycle rate of 99.3 percent was achieved.

Pollution prevention is integrated into the SPR mission through policies, procedures, instructions, performance measures, and standards. This was accomplished by updating the environmental goals and training, computerizing the regulatory tracking, self-assessments, and continual improvement priority planning. Pollution prevention is also integrated into the Behavioral Safety process at all sites by including pollution prevention behaviors in the critical behavior inventory list. To heighten employee pollution prevention awareness and behavioral safety, observers "observe" the work force and note defined pollution prevention behaviors providing positive reinforcement for those beneficial behaviors.

Awards from outside entities validate the benefits of a working EMS. In 2005 New Orleans, Bayou Choctaw, and West Hackberry received - for the third time – the Environmental

Management Award at the highest "Excellence" level from the Louisiana Quality Foundation. The award recognizes leadership in environmental management. The SPR also received an honorable mention by the White House Closing the Circle for EMS implementation at the SPR. By controlling significant environmental aspects such as spills, other related and costly environmental aspects such as waste are avoided.

In 2005, the SPR was the recipient of the 2004 Governor's Environmental Leadership Award in the category of Pollution

Prevention. The award, presented by LA Governor Blanco and LDEQ Secretary, Mike McDaniel, was for the SPR's Innovative Approaches to Reducing Waste: Mercury Lamp Reduction Project. This "green" lighting retrofit project resulted in a 70% reduction in mercury in the waste stream. The SPR partnered with the Federal Energy Management Program (FEMP) for matching funds. The project installed energy efficient ballasts outfitted with "green" manufacturer-certified lamps that would pass the Toxicity Characteristic Leaching Procedure (TCLP) test. This innovative pollution prevention project also incorporated "reuse" of used bulbs which were donated to non-profit agencies including Sulphur Care/Help Program, the Lake Charles Louisiana Salvation Army, Goodwill Industries, and Habitat for Humanity. By donating old lamps and ballasts, the SPR eliminated disposal/recycling costs equal to $5,882. The Bayou Choctaw Site saved approximately 43,511 kWhs from the new energy efficient bulbs equal to a total annual cost savings of $5,470, and West Hackberry Site saved 52,564 kWhs with a total annual cost savings of $4,266. The SPR was able to achieve a cost avoidance of $39,000 for the Louisiana SPR sites through the FEMP funding

The overall cost avoidance for this project was $54,618. This pollution prevention accomplishment is acknowledged as an outreach initiative in the SPR's membership in EPA's National Environmental Performance Track program.

The SPR was awarded the National Association of Environmental Professionals (NAEP) National Environmental Excellence Award for degasification.

Crude oil stored at the SPR slowly accumulates methane and ethane gases in the caverns. When depressured, these gases strip other components determined to produce unhealthy effects, especially in the elderly and the very young. To mitigate this release, the Degas project was initiated. What makes the award so special is that a reduction of emissions was not required by law, and the benefits extend down the valve to the customer. It is estimated that the program will prevent the release of as much as 77,000 tons of Volitile Organic Compounds (VOCs) from a single drawdown at the end of the SPR's 25-year life cycle.

During CY 2005, the process of screening purchase requests against the SPR Qualified Products List and the Affirmative Procurement guidelines continued to assure that products purchased met environmental criteria established to reduce waste, toxicity and ensure purchasing of EPA-designated and environmentally friendly products. During CY 2005, approximately 1,800 chemical products were evaluated in accordance with AP criteria. The SPR Pollution Prevention Energy Efficiency (P2E2) initiatives continue to address the Greening the Government Executive Orders: E.O 13101 (Waste Prevention, Recycling and Federal Acquisition), E.O. 13148 (Leadership in Environmental Management), E.O. 13123 (Efficient Energy Management) and E.O. 13149 (Federal Fleet and Transportation Efficiency). P2E2 goals and projects are delineated in Table 2-1.

A P2E2 committee was established with the purpose of developing and coordinating energy efficiency and pollution prevention projects for the SPR. The committee meets on a quarterly basis to incorporate activities designated by the DOE Energy Policy Act of 1992, which calls for programs designed to incorporate energy heating/cooling initiatives and accelerate the introduction of alternative fuel vehicles to reduce the nation's dependence on imported oil.

Table 2-1. SPR P2 and E2 Leadership Goals

	SPR POLLUTION PREVENTION AND ENERGY EFFICIENCY LEADERSHIP GOALS	2005 ACTION TO REACH TARGETED GOALS
1	Reduce Hazardous Waste from routine operations by 90 % by 2005, using a 1993 baseline.	• Track Big Green Box for recycling portable electronics. Property Excess implemented and being tracked. • Annual update of Environmental Instruction (s) where applicable • Make improvements to the SPR Qualified Products List. • Start Chemical Management and Acquisition Improvement Team under PID. • Communicate with consultants to provide product substitution analyses. • Develop and expand ESH webpage to improve communication of HW generation. • Prepare Annual Waste Minimization and P2 Progress Report to DOE in Nov 2005. • Track and report P2 accomplishments through year that have achieved HW reduction. Nov 2005 to HQ. • FY 2005 Goal 539 lbs (.241 metric tons) • Achieved FY 05= 495 lbs and CY 05= 460.2lbs • 1993 baseline = 5390 lbs. Or 2.44 metric tons.
2	Reduce releases of toxic chemicals subject to Toxic Chemical Release Inventory (TRI) reporting by 90% by 2005, using a 1993 baseline.	TRI reporting is not applicable since the reporting occurs only during the SPR crude oil movement as required to meet SPR mission objectives. In the baseline year of 1993, no TRI Report was required.

Table 2-1. SPR P2 and E2 Leadership Goals (continued)

	SPR POLLUTION PREVENTION AND ENERGY EFFICIENCY LEADERSHIP GOALS	2005 ACTION TO REACH TARGETED GOALS
3	Reduce sanitary waste from routine operations by 75% by 2005 and 80% by 2010 using a 1993 baseline.	• Continued to work with sites to get more items out of the trash and into recycling (cans and cardboard). • Communicated with counterparts routinely to emphasize cost associated with waste reduction. • Followed through on E2P2 Plan to assure compliance. • Developed and promoted improved method for communication and collecting sanitary waste numbers. • Expanded ESH webpage. Budget: $ .00 • 1993 baseline = 6,816,508 lbs or 3090 metric tons • FY 05 Goal = 1,704,127 lbs. (773 metric tons) • FY 05 Goal achieved (402,616 lbs generated)
4	Recycle 45% of sanitary waste from all operations by 2005 and 50 percent by 2010.	• Updated budget and renewed the contract for NOLA recycling program. • Evaluated PPOA projects to expand recycling: Oak Ridge Recycling Center • Participated in a recycling promotional (Mardi Gras Bead Recycling) • Utilized various media to promote recycling and reuse (SPR banner and newsletter) • Worked with sites to improve their specific recycling programs. • Prepared Annual Waste Minimization and P2 Progress Report to DOE in Nov 2005. • Follow through on E2P2 Plan to assure compliance • Budgeted: $8K for NOLA recycling contract. • 2005 Goal = 45% and FY 05 Achieved 88%
5	Reduce waste resulting from cleanup, stabilization, and decommissioning activities by 10 % on an annual basis.	• Not Applicable – cleanup, stabilization, decommissioning activities are not ongoing activities at the SPR.

Table 2-1. SPR P2 and E2 Leadership Goals (continued)

	SPR POLLUTION PREVENTION AND ENERGY EFFICIENCY LEADERSHIP GOALS	2005 ACTION TO REACH TARGETED GOALS
6	Increase purchases of EPA-designated items with recycle content to 100%, except when not available competitively at reasonable price or do not meet performance standards.	• The Affirmative Procurement (AP)Program ensures that designated products are purchased with some recycled-content unless there is written justification that the product is not available competitively, within a reasonable time frame, does not meet appropriate performance standards, or is available only at an unreasonable price. AP items that have a MSDS are included on the Qualified Product List. • Reviewed and updated Environmental Instruction for AP (Section 3.7) • Established a list of resources for Affirmative Procurement in new ESH webpage • Tracked AP to meet WAD success rates of 95% minimum and 100% target goals • Improved tracking system for affirmative procurement purchases (e.g. SAP query) • Participated in the DOE national teleconference meetings on Affirmative Procurement. • Coordinated with DOE counterpart and DOE Green Advocate as needed. • Utilized teamwork approach to achieve AP by designating key persons or owners of the procurement process. • Completed annual Affirmative Procurement Report (RCRA 6002) to DOE in Dec 2004. • FY 2005 of 100% was achieved.
7	Reduce energy consumption through life-cycle cost effective measures by: • 40% by 2005 and 45% by 2010 per gross square foot for buildings, using a 1985 baseline. • Revised 1985 baseline of 4,943,309 kWhs.	• A pilot program to install occupancy light sensors for manager's offices in the 900 East building was accomplished in FY 2005. • Annual balancing of the air conditioning and heating systems in the New Orleans buildings was recommended to conserve energy. Being Implemented. • Note: As the New Orleans buildings are all leased, there is a limited performance period which limits life cycle cost analysis and which also may limit achieving a 40% reduction by FY 2005. Increased occupancy by 35% in building 850, due to elimination office space at 800 building, will offset savings in energy consumption that would otherwise have been realized. Loss of occupancy due to hurricane damage also negatively impacted accomplishing this goal.

Table 2-1. SPR P2 and E2 Leadership Goals (continued)

	SPR POLLUTION PREVENTION AND ENERGY EFFICIENCY LEADERSHIP GOALS	2005 ACTION TO REACH TARGETED GOALS
7 (cont.)	• 20 percent by 2005 and 30 percent by 2010 per gross square foot, or per other unit as applicable, for laboratory and industrial facilities, using a 1990 baseline of 35,283,191 kWhs	• The metered electric process project was cancelled in 2003. Determined as not feasible. • BC HVAC temperature controls, air conditioning building and lighting were upgraded • BM HVAC temperature control upgrade, air conditioning building upgrades and lighting upgrades are scheduled for installation in FY2005-6. • WH air conditioning building upgrades and lighting upgrades are scheduled for installation in FY2005. • BH airlock vestibules, HVAC temperature controls, and air conditioning building upgrades are scheduled for installation in FY2007. • Undefined energy efficiency task is scheduled for all four SPR storage sites in FY2007- 2009. • Begin effort to break out hotel load to meet DOE mandates and EO 13123 or to obtain new DOE directive if project is cost prohibitive.
8	Increase the purchase of electricity from clean energy sources: a) Increase purchase of electricity from renewable energy sources by including provisions for such purchase as a component of our request for bids in 100% of all future DOE competitive solicitations for electricity. b) Increase the purchase of electricity from less greenhouse gas-intensive sources, including, but not limited to, new advanced technology fossil energy systems, hydroelectric, and other highly efficient generating technologies.	• The SPR is served by two commercial electrical power utility companies: Entergy (Bayou Choctaw, West Hackberry, and Big Hill) and Reliant Energy (Bryan Mound). There are currently no other options for purchase of power in the region. The SPR purchases power from these companies in accordance with tariffs that are approved by the Public Service Commission of Louisiana or the Public Utility Commission of Texas, and neither Entergy nor Reliant has available tariffs for purchase of "Green" power. Future purchases of electrical power will include provisions for Green Power should such power become available.

Table 2-1. SPR P2 and E2 Leadership Goals (continued)

	SPR POLLUTION PREVENTION AND ENERGY EFFICIENCY LEADERSHIP GOALS	2005 ACTION TO REACH TARGETED GOALS
9	Retrofit or replace 100% of chillers greater than 150 tons of cooling capacity and manufactured before 1984 that uses class I refrigerants by 2005.	• Not applicable as the SPR does not have chillers greater than 150 tons capacity.
10	Eliminate use of class I ozone depleting substances by 2010, to the extent economically practicable, and to the extent that safe alternative chemicals are available for DOE class I applications.	• Remaining 6288 pounds of Halon were removed in 2004. No more Halon remains on the SPR. There are no other class I ozone depleting substances on the SPR.
11	Reduce greenhouse gas emissions attributed to facility energy use through life-cycle cost-effective measures by 25% by 2005 and 30% by 2010, using 1990 as a baseline.	• Not Applicable. The only greenhouse gas emissions attributed to facility energy use is from emergency equipment (diesel generators, diesel pumps). They are only used for power generation during an emergency, which is considered an upset condition and not applicable.
12	Reduce our entire fleet's annual petroleum consumption by at least 20% by 2005 in comparison to 1999, including improving the fuel economy of new light duty vehicle acquisitions, and by other means.	• Continued with replacement of older vehicles with compact and subcompact vehicles. • Continued with replacement of existing vehicles with new alternative fuel vehicles. • Continued to track usage of LPG (propane) vs. gasoline. • Have in place a contractor for "fuel delivery" once a week of propane to service alternative fuel vehicles • NOTE: Due to recent security enhancements that include purchasing additional non-alternative fuel vehicles, achievement of the targets may be hindered. • Baseline1999- 158,140 gallons of petroleum fuel was consumed. • Goal achieved 1 year early in 2004.
13	Acquire annually at least 75% of light duty vehicles as alternative fuel vehicles (AFV), in accordance with the requirements of the Energy Policy Act 1992.	• An approved program is underway to replace existing gasoline vehicles with alternate fuel vehicles. The approved plan achieves 75 percent of vehicle replacements as alternate fuel vehicles (LPG ½ ton pick up trucks) over the next five years. • Completed purchase of electric vehicles except where scooter replacement is not feasible. Determined that scooters did not fully meet definition of alternative fuel vehicle for this goal. • Late fall 2004, Ford supplier discontinued production of LPG trucks. Currently no other GSA provider that meets SPR needs, making achievability of this goal near to impossible. GM announcement to not enter the propane market, made goal 13 unachievable. • NOTE: Due to recent security enhancements, which include purchasing additional non-alternative fuel vehicles, achievement of the targets may be hindered.

Table 2-1. SPR P2 and E2 Leadership Goals (continued)

	SPR POLLUTION PREVENTION AND ENERGY EFFICIENCY LEADERSHIP GOALS	2005 ACTION TO REACH TARGETED GOALS
14	Increase usage rate of alternative fuel in departmental alternative fuel vehicles to 75% by 2005 and 90% by 2010 in areas where alternative fuel infrastructure is available.	• Continued to replace gasoline vehicles with alternative fuel vehicles (AFV) in early 2005. • Evaluated the option of implementing LPG fueling stations. Projected 2005 installation date was tabled. • Late fall 2004, Ford supplier discontinued production of LPG trucks. GM declined to enter propane market. Proposed ethane vehicles to enter market in 2006. • NOTE: The use of alternative fuel vehicles would involve high costs, making them unlikely to be acceptable in New Orleans. In addition, the New Orleans area does not presently have alternative fuel infrastructure. • NOTE: Continued to review markets and infrastructure for feasibility for future years. These are not currently viable options due to market, infrastructure or cost: methane, ethanol, hydrogen, compressed natural gas and bio-diesel.

Membership in EPA's Performance Track and Texas' Clean Texas Programs

In mid-2000 EPA implemented the National Environmental Performance Track Program in response to E.O. 13148. The program promotes and recognizes outstanding environmental management performance in agencies and facilities. All five SPR facilities were accepted - as a single multi-site member - as part of 228 charter members named nationwide and their first three-year membership commitment was completed in 2003. The SPR re-applied and was accepted in 2004 for a second three year membership. While there are currently about 400 members, less than 50 % of the original charter members have succeeded in maintaining their continuous charter membership as the SPR has. Member facilities are top environmental performers who systematically manage environmental responsibilities, reduce and prevent pollution, and are good corporate neighbors. They have working environmental management systems, are committed to continuous improvement, public outreach, and performance reporting, and have achieved a record of sustained compliance with environmental regulations.

In recognition of their environmental achievements, Performance Track members are rewarded with recognition, access to state of the art information, and regulatory and administrative flexibility.

In 2005, Big Hill and Bryan Mound became the first "Platinum" members of Clean Texas. The platinum level of the state program is analogous to the Performance Track program, except that individual sites are recognized for membership.

Performance Track and Clean Texas members must make measurable commitments for environmental improvement; larger facilities such as the SPR sites must make at least four. The SPR chose to make the following five performance commitments, to be achieved by the end of CY 2006 for Performance Track and CY 2007 for Clean Texas:

1. Reduce hazardous solid waste from fluorescent bulbs to no more than 258 lbs/yr SPR-wide (P-Track), 138 lbs/yr for Big Hill (Clean Texas), and 120 lbs/yr for Bryan Mound (Clean Texas).
2. Reduce volatile organic compound (VOC) emissions from workover operations by 15%, based on an average of workover

VOCs emitted at Bryan Mound and Big Hill over the previous six years (P-Track and Clean Texas). This is considered a "regional commitment" that is equal to two commitments for Performance Track.

3. Avoid potential VOC emissions of at least 500 tons off-site at terminals and refineries that would receive crude oil from Big Hill during a drawdown (Performance Track and Clean Texas-Big Hill only). Emissions will be reduced by the degasification plant at Big Hill.
4. Reduce the amount of lead purchased annually in lead/acid batteries used in the electric vehicle fleet by 5%, based on purchasing in 2003. This is no more than 3051 lbs/yr purchased SPR-wide (P-Track), no more than 794 lbs/yr purchased at Big Hill (Clean Texas), and no more than 251 lbs/yr purchased at Bryan Mound (Clean Texas).
5. Set aside at least 40 acres of grassy environment on-site for migrating birds to utilize for feeding and protection during the spring and fall migrations (Performance Track and Clean Texas – Bryan Mound only).

Performance Track and Clean Texas members complete annual performance reports that document facility assessments and inspections, corrective actions taken as a result of assessments and inspections, community outreach, and success in meeting their environmental commitments. Information pertaining to achieving the Clean Texas commitments is included in the Performance Track reports. The reports for CY 2001 through 2005 are available to the public at the EPA website www.epa.gov/performancetrack. Success in meeting the three-year commitments is discussed as follows:

1. Reduce hazardous solid waste - The SPR recycles all spent fluorescent bulbs. Since the TX SPR sites are regulated by the RCT for waste generation, spent old-style high mercury content fluorescent bulbs must be counted as hazardous waste in Texas. Bulbs in all fluorescent lighting fixtures were systematically inventoried at all sites in 2004. Hazardous waste generation has been reduced through replacement of these bulbs with new lower mercury content "green" bulbs. All old-style bulbs that were salvageable were donated to Habitat for Humanity, Care/Help of Sulphur, LA, the Salvation Army, and Goodwill Industries. In CY 2005, only 27.5 lbs of spent old-style bulbs were removed from the SPR, all at Big Hill. This is a drastic decrease from 2004 when 604 lbs were removed and recycled, SPR-wide.

2. Reduce volatile organic compound (VOC) emissions from workover operations – To minimize VOC emissions, the entire workover oil transfer process is being examined to reduce, eliminate, or consume VOC emissions. A source of substantial VOC losses are frac tanks used as a crude oil surge vessel during cavern workovers. In 2005, the M&O recommended use of pressure tanks, existing surge tanks, and multi-cavern transfers to reduce frac tank emissions from cavern depressurization during cavern workovers. DOE tasked the A-E to review these options and develop a design for implementation of the most feasible and economical option. Workover VOC emissions in 2005 totaled 26.34 tons – well below the 45 tons per year target for 2006. Low VOC emissions observed in 2005 were more likely due to the

characteristics of the crude oil of the particular caverns depressurized rather than changes in the workover process.

3. Avoid potential VOC emissions off-site at terminals and refineries during a drawdown – Crude oil degasification of selected “gassy” caverns continued in 2005 at the Big Hill site to remove unwanted methane and ethane gases from the crude oil supply. As they evaporate, these gases strip valuable oil fractions from the crude oil. The VOC avoidance target for a hypothetical CY 2006 drawdown is 500 tons. By the end of CY 2005, Caverns 101, 103, 104, 112, and 115 were degassed and 594 tons of VOC emissions were avoided. The target (500 tons avoided) was surpassed and the commitment was completed. To further reduce emissions during the degasification process, 108,757 bbls of degassed crude oil that could not be directly re-injected into the underground storage caverns were directed into a floating roof surge tank instead of through a frac tank. This action itself avoided VOC emissions by 2.5 tons.

4. Reduce the amount of lead purchased in lead acid batteries used in the electric vehicle fleet - conventional lead/acid batteries that were original equipment in the electric vehicles were replaced (as the batteries failed) with newer batteries that use absorbed glass electrolyte technology. These batteries are designed to last longer, reducing the frequency of battery purchasing and therefore the amount of lead purchased annually. By 2005, it was found that the new technology batteries actually contained more lead and did not perform any better than the original equipment batteries. Consequently, the

sites were notified to resume using the original equipment batteries and make an effort to promote battery longevity through greater emphasis on battery maintenance and proper charging. In 2005, 5,019 lbs of lead were purchased, well above the SPR wide target of 3,051 lbs/yr. Both Texas sites exceeded their Clean Texas targets; 1,740 lbs were purchased at Big Hill (target: 794 lbs/yr) and 1,375 lbs were purchased at Bryan Mound (target: 251 lbs/yr) due to immediate replacement needs.

5. Set aside areas on site for migrating birds and other wildlife – Acreage at the Bryan Mound, West Hackberry, and Bayou Choctaw sites have been set aside to provide cover and food for nesting and migratory birds and other wildlife. About 40 acres at Bryan Mound are not mowed from late summer to early spring, thus supporting migratory bird movement. About 32 acres at West Hackberry are not mowed and/or posted to avoid from early spring through mid summer, allowing bird nesting and brooding to be completed. Each fall about 5 acres at Bayou Choctaw are seeded with winter wheat, rape, oats, rye, clover, and various vegetables. These areas serve as food plots for wildlife during the winter and early spring. Other wildlife enhancements are also implemented throughout the SPR. An osprey tower was constructed at Bryan Mound, and ospreys have been observed on it. Communal nesting houses are also used for purple martins at Bryan Mound. Wood duck nest boxes were constructed out of wood from waste property pallets at Bayou Choctaw.

Superfund Amendments and Reauthorization Act (SARA)

SARA Title III Tier Two reports, also known as Emergency Planning and Community Right-to-Know Act (EPCRA) Section 312 reports, were prepared and distributed as required by March 1st to state and local emergency planning committees and local fire departments. Tables 2-2 through 2-7 contain a summary of the inventory information that was submitted for CY 2005. The SPR continued to use an electronic format as required by the state implementing agencies for the preparation and submission of Tier Two Reports for the SPR facilities in Louisiana, Texas, and the Stennis Warehouse in Mississippi.

SPR sites are required to report under EPCRA Section 313, by submitting Toxic Release Inventory (TRI) Form R when reporting thresholds, defined by emissions from crude oil placed in commerce, are exceeded. Specifically when crude oil is placed in commerce, it is considered to be repackaging of hazardous substances and must be reported. This form must be submitted by July 1 for the reporting thresholds exceeded during the preceding calendar year. The submittal of a (TRI) Form R was required in CY 2005 because the SPR introduced crude oil into commerce from the Bayou Choctaw, Bryan Mound, and West Hackberry sites due to the Hurricane Ivan Exchange in CY 2004.

International Organization for Standardization (ISO 14001) Certification

On May 19, 2000, the DM environmental management system (EMS) was first evaluated by an independent registrar and certified to be in conformance with the International Organization for Standardization 14001 standard, and in accordance with ANSI-

ASO National Accreditation Board (ANAB) requirements, the DM EMS was recertified in 2003. Since then, the registrar has routinely evaluated the EMS every six months. There were three minor non-conformities identified in the 2005 audits summarized below:

- Updates to EMS aspects, impact, objectives, targets, and programs have not been announced in the ESPRIT.
- A request for EMS information form Sandia National Laboratory was not recorded in accordance with DM procedures.
- Current audit program does not ensure the EMS is audited to the entire ISO 14001 Standard.

<u>DOE Order 435.1, "Radioactive Waste Management"</u>

There are no processes that generate radioactive wastes at any of the SPR sites and therefore this order does not apply.

<u>DOE Order 5400.5, "Radiation Protection of the Public and the Environment"</u>

In addition to the X-ray sources used in equipment the SPR does subcontract work where sealed radioactive sources are used in monitoring activities. This topic is addressed in Section 4 of this report.

Table 2-2. 2005 Louisiana SARA Title III Tier Two Summary at Bayou Choctaw

Chemical Name (Category)	* Max Daily Amt (lbs.)	Location
Crude oil, petroleum	> 1 billion	Site tanks, piping, and underground caverns. Flammable Storage Building
Diesel fuel #2	10,000 - 99,999	Emergency Generator Fuel Tank, Property Tank 2, Workover Rig, Contractor Laydown Area
FC-203CE Lightwater Brand AFFF	10,000 - 99,999	Foam storage building
FC-203CF Lightwater Brand AFFF	1,000 – 9,999	Foam deluge building
Flogard POT805	1,000 – 9,999	Flammable Storage Building, Potable Water Building
Gasoline	1,000 - 9,999	Property tank # 1, HPPP Flammable Storage Cabinet
Motor Oil	1,000 - 9,999	Bench stock, Flammable storage building, Flammable storage cabinet, High pressure pump pad, Maintenance bay, Property flammable cabinet Workover Rig, Building 413
Paints, flammable or combustible	1,000 – 9,999	Flammable Storage Building, Property Flammable Cabinet, Workover Rig

Table 2-2. 2005 Louisiana SARA Title III Tier Two Summary at Bayou Choctaw (Continued)

Chemical Name (Category)	* Max Daily Amt (lbs.)	Location
Sodium Chloride	1,000 - 9,999	Potable water building
Sodium Hypochlorite Solution	100 - 999	Potable water building
Windex	100 - 999	Benchstock, Bldg 401, Bldg 402, Bldg 413

* Reporting range specified by LA SARA Title III Tier Two Reporting Requirement

Table 2-3. 2005 Texas SARA Title III Tier Two Summary at Big Hill

Chemical Name (Category)	* Max Daily Amt (lbs.)	Location
Crude oil, petroleum	> 1 billion	Site tanks, piping, and underground caverns. BHT-2, BHT-6, BHT-7, BHT-10
Diesel fuel	10,000 - 99,999	BHSE-46-1, BHSE-46-2, BHT-4, BHT-11, BHT-50, Big Hill Diesel Tank, BHT-51, Laydown Yard, Workover Rig, Degas Flammable Cabinet
Diglycolamine	10,000 – 99,999	Degas, In System, Degas Water Tank
FC-600 Lightwater Brand ATC/AFFF	10,000 - 99,999	Fire Truck, Crude oil Pad, Boat Shed, Fire Bay Flammable Cabinet, Foam Building BHT -16
Gasoline	10,000 – 99,999	BHT-52, Big Hill Unleaded Gas Tank, Degas Flammable Storage Bldg.,Tool Trailer and Field Stations, Bldg. 803, Work Truck.
Motor Oil	10,000 – 99,999	1st Stage Compressor, 2nd Stage Compressor, Amine Reclaimer, Benchstock, Crude Oil Lab, Degas Flammable Cabinet, Drum Storage, Environmental Lab, Flammable Storage Bldg 817, I&C Cal Shop, Laydown Yard, Maintenance Flammable Storage, Propane Tanks, RWIP, RWIS
Propane	10,000 – 99,999	Propane Skid, Property Flammable Cabinet, TVP-2000

* Reporting range specified by Texas SARA Title III Tier Two Reporting Requirement

Table 2-4. 2005 Texas SARA Title III Tier Two Summary at Bryan Mound

Chemical Name (Category)	*Max Daily Amt (lbs.)	Location
Crude oil, petroleum	> 1 billion	Site Tanks, Piping, and Underground Caverns
FC-203CF Light Water Brand AFFF	100,000 - 999,000	AFFF Fixed systems, Storage and Mobil units
Gasoline	10,000 - 99,999	Fuel Tank Area, Diked Area

* Reporting range specified by Texas SARA Title III Tier Two Reporting Requirement

Table 2-5. 2005 Louisiana SARA Title III Tier Two Summary at Stennis Warehouse

Chemical Name (Category)	*Max Daily Amt (lbs.)	Location
Diesel fuel #2	1,000 – 9,999	Westside of warehouse

* Reporting range specified by LA SARA Title III Tier Two Reporting Requirement

Table 2-6. 2005 Louisiana SARA Title III Tier Two Summary in Offsite Pipelines

Chemical Name (Category)	*Max Daily Amt (lbs.)	Location
Crude oil, petroleum	50,000,000 - 99,999,999	Off-site pipelines in Calcasieu Parish, LA (West Hackberry)
Crude oil, petroleum	10,000,000 - 49,999,999	Off-site pipelines in Cameron Parish, LA (West Hackberry)

* Reporting range specified by LA SARA Title III Tier Two Reporting Requirement

Table 2-7. 2005 Louisiana SARA Title III Tier Two Summary at West Hackberry

Chemical Name (Category)	*Max Daily Amt (lbs.)	Location
Chemguard Purple K Dry Chemical	1,000 – 9,999	Building 305
Crude oil, petroleum	> 1 billion	Site tanks, piping, underground caverns, Lake Charles meter station piping, Warehouse E
Diesel fuel #2	10,000 - 99,999	Fuel Pump Tank, Work over Rig, Maintenance Lay down Yard, Trailer-3
FC-203CF Light Water Brand AFFF	10,000 – 99,999	Foam Storage Bldg., Fire Truck WHFT3, Bldg 303, Bldg 304
FC-600 Lightwater Brand ATC/AFFF	1,000 - 9,999	Bldg 303, Bldg 305
Gasoline	10,000 - 99,999	Fuel Pump Tank, Maintenance Lay down Yard, Trailer 3, Trailer 5
Motor Oil	10,000 - 99,999	Workover Rig, Flammable Storage Building, HPPP Flammable Cabinet, Slop Oil Pad, Warehouse A, Armory – MCC, OCB 5KB Substation, Main Gate, Workover Rig Yard, LCMS Bldg 320
Oil Base Sweep EZ Floor Sweep	100 – 999	Warehouse A, Warehouse D
Paints, flammable or combustible	1,000 – 9,999	Flammable Storage Building, Workover Rig, Trailer 3, Trailer 5
Propane	1,000 – 9,999	LCMS Propane Tank
Silica, crystalline-quartz	1,000 - 9,999	Paint Laydown Yard

* Reporting range specified by LA SARA Title III Tier Two Reporting Requirement

2.2 MAJOR ENVIRONMENTAL ISSUES AND ACTIONS

Gassy Oil

When SPR crude oil is brought to surface facilities, methane and ethane gas (non-regulated) that has migrated from the salt in the salt dome is released, stripping regulated pollutants (VOC) into the atmosphere. Also, geothermal processes raise the crude oil temperature and can elevate the true vapor pressure (TVP) to a point where it is above the regulatory limits of 14.7 pounds per square inch (PSI) for storage in floating roof tanks, potentially affecting some of the SPR sites and receiving commercial terminals. The SPR first confirmed this phenomenon in 1993. Beginning in 1995 the SPR conducted operations to separate and remove gas. Operation of the degas plant began at Big Hill in early 2004 and continued through 2005.

West Hackberry North Anhydrite Pit

A re-engineered compacted soil cap for the closed North Anhydrite Pit was completed in early 2005. Re-sodding and re-seeding efforts were commenced late in the year. Just after construction of the re-graded cap, some minor areas were re-worked and due to the slow start and winter rains small sections of the cap were eroded.

The winter rains also commenced a similar erosional impact at the similar closed South Anhydrite Pit. Follow-on actions were beginning to be investigated at the close of the year and response activities were in progress for limited areas of dike seepage and erosion noted. A project design action was commenced in CY2005 for remedial cap restoration.

Billion Barrel Expansion

During CY 2005 SPR Environmental Staff provided extensive environmental input for the EIS to expand the SPR storage capacity to one billion barrels. The support included the review and comment of early drafts of the EIS, scheduling requirements for permitting and suggested staffing and budgetary requirements.

DOE On-Site Appraisal

SPRPMO On-Site Management Appraisal teams conduct formal visits to SPR sites annually. The teams meet with site contractor management staff and audit environmental compliance and environmental management system practices, survey performance indicators, and review the audit findings with the contractor staff during exit briefings. Findings were tracked to completion in the DOE Consolidated Corrective Action Plan and in the DM Assessment Tracking System (ATS). During FY 2005 there were five low risk environmental findings associated with the audits, and all were corrected by June, 2006.

Hurricanes Katrina and Rita

During the fall of CY 2005 the SPR Headquarters in New Orleans, Big Hill site, West Hackberry site, Bayou Choctaw site and Stennis Warehouse were each impacted by hurricanes Rita and Katrina. The SPR established Emergency Operations Centers to ensure that the SPR mission would not be halted and employees key to the operation of the SPR were

temporarily relocated to areas that would allow them to work at a fully functional status. As a result of this, within days after each hurricane the SPR delivered thousands of barrels of crude oil to help mitigate the supply interruption caused by the hurricanes. Although some of the sites impacted suffered moderate to heavy damage caused by

wind and or flooding, there were no impacts to the surrounding environment. In September 2005 the SPR received the Secretary's Gold Medal Award, which is the U.S. Department of Energy's highest award, for this success in maintaining operational readiness during these catrostrophic events.

Malcolm Baldrige Award

DynMcDermott Petroleum Operations Company (DM) was a recipient of the prestigious 2005 Malcolm Baldrige Award, the nation's highest honor for Performance Excellence. DM is the only federal government "prime" contractor to receive this recognition and is considered a benchmark within the federal government. Additionally, DM is the only company in the oil and gas industry to receive this recognition from the President of the United States.

The Baldrige Award is given by the President of the United States to businesses—manufacturing and service, small and large—and to education and health care organizations that apply and are judged to be outstanding in seven areas: leadership; strategic planning; customer and market focus; measurement, analysis, and knowledge management; human resource focus; process management; and results. Congress established the award program in 1987 to recognize U.S. organizations for their achievements in quality and performance and to raise awareness about the importance of quality and performance excellence as a competitive edge. The award is not given for specific products or services. Three awards may be given annually in each of these categories: manufacturing, service, small business, education, and health care. In October 2004, President Bush signed into law legislation that authorizes to expand the Malcolm Baldrige National Quality Award Program to include non-profit and government organizations.

While the Baldrige Award and the Baldrige recipients are the very visible centerpiece of the U.S. quality movement, a broader national quality program has evolved around the award and its criteria. A report, Building on Baldrige: American Quality for the 21st Century, by the private Council on Competitiveness, said, “More than any other program, the Baldrige Quality Award is responsible for making quality a national priority and disseminating best practices across the United States."

M&O Contractor Organizational Assessment

The New Orleans environmental group conducted annual EMS and compliance assessments of all five sites in FY 2005. Assessors were independent of the sites and were not accountable to those directly responsible for the issues audited.

Environmental compliance was determined through evaluating EMS performance which included compliance with regulations, DOE contract requirements, and other internal requirements. Findings were tracked to completion in ATS.

Audit topics were chosen based on current management concerns and the results of previous audits. Potable water management was the environmental concern for 2005 at Big Hill, Bryan Mound, and Bayou Choctaw. Improvements made since 2003 were examined and have indicated greater awareness of regulatory requirements by certified water operators. The use of the Qualified Products List for purchasing environmentally friendly products has also been an area of concern. Annual evaluation of its use has shown that purchasing compliance has increased from 81.6% in 2004 to 94.2% in 2005. Improved compliance has resulted from continuing communication with product requestors and purchasers in using the Qualified Products List.

DM identified 15 compliance findings and seven EMS non-conformances during FY 2005. All compliance findings were classified as low risk hazards, minor deviations from internal requirements and regulations. All EMS non-conformances were also minor. Corrective action plans for all of the findings and non-conformances were provided, and 11 compliance findings and 6 EMS non-conformances were closed in CY 2005. Table 2-8 is a tabulation of 2005 findings/non-conformances by site.

Table 2-8. FY 2005 M&O Contractor Organizational Assessment Environmental Findings and Non-Conformances

Site	High Risk Hazard (compliance)	Medium Risk Hazard (compliance)	Low Risk Hazard (compliance)	Low Risk Hazard EMS
Bayou Choctaw	0	0	4	1
Big Hill	0	0	3	0
Bryan Mound	0	0	3	2
New Orleans	0	0	2	4
West Hackberry	0	0	3	0

Third Party EMS Audits

Two surveillance audits were conducted in CY 2005 by the DM ISO 14001 registrar, Advanced Waste Management Systems, Inc. Each crude oil storage site and the Stennis Warehouse were audited once, and the New Orleans site (headquarters) twice. The performance of DM's EMS was evaluated through the review of all 17 elements of the ISO 14001 standard since the Stennis Warehouse was added to DM's certification. In CY 2005 there were three non-conformances with the ISO standard, two related to the element of Communication and one to the element of Internal Audit. Corrective action plans were developed for all non-conformances and one non-conformance was closed by the end of the year. A recommendation was given for DM to maintain the ISO 14001 certification at the conclusion of both audits.

Regulatory Inspections/Visits

There were thirteen inspections or visits by or on behalf of regulatory agencies to SPR facilities in 2005 summarized in Table 2-9. These visits are routine and are usually conducted by the regulatory agencies to ensure compliance or to address concerns regarding activities at the SPR facilities. There were no findings associated with these inspections.

Table 2-9. Summary of Regulatory and Third-Party Inspections/Visits During 2005

Site	Organization	Remarks
BC	ISO 14001 Registrar	ISO 14001 Surveillance Audit. No Findings. Recommendation to maintain certification.
	LDHH	Louisiana Department of Health and Hospitals (LDHH) collected potable water well samples for arsenic and antimony testing.
	LDEQ	An unannounced waste tire inspection was conducted. Waste tire records were provided to auditor. No findings.
BH	RCT and TDPS	Inspected oil recovery operations at the anhydrite pond due to string failure in Cavern 113. No findings.
	RCT	Brine ponds were inspection in conjunction with a permit application submitted by DM to reline the ponds. No findings.
	TCEQ	Determination made on land use around the site in regards to the Big Hill flexible air permit application. No findings.
	ISO 14001 Registrar	ISO 14001 Surveillance Audit. No Findings. Recommendation to maintain certification.

Table 2-9. Summary of Regulatory and Third-Party Inspections/Visits During 2005 (continued)

Site	Organization	Remarks
BM	TGLO	Announced audit of site's spill prevention and response program was conducted. No findings.
	ISO 14001 Registrar	ISO 14001 Surveillance Audit. No Findings. Recommendation to maintain certification.
NO	ISO 14001 Registrar	Two surveillance audits. Three minor findings, two related to the Communication element and one to the element of Internal Audit. Recommendation to maintain certification.
WH	ISO 14001 Registrar	ISO 14001 Surveillance Audit. No Findings. Recommendation to maintain certification.
	LDEQ	Unannounced visit for inspection of the water program. No violations were identified, but the inspector recommended that the car wash rinseate sampling method be modified. The handling of duplicate analysis data on the DMRs was also discussed.

Non-Routine Releases

The majority of the non-routine releases of pollutants occur with the spills of crude oil and brine into the environment from the SPR operations. In CY2005, there was one reportable brine spill and zero reportable crude oil spills at the SPR.

State and federal agencies require notification if an oil spill meets or exceeds the reportable criteria. This reportable criteria is established by each agency and may vary greatly in the amount to be considered a reportable spill. This is illustrated by the following examples: one barrel for the LDNR, five barrels for the RCT, or a sheen on a navigable waterway for the NRC.

During CY 2005, the SPR moved (received and transferred internally) 14.4 million m^3 (90.4 mmb) of oil and disposed of 4.93

million m^3 (31.03 mmb) of brine. Additional spill information is listed in Tables 2-10 through 2-12.

The long-term trend for spills and releases has declined substantially from 26 in 1990 to one in 2005 as depicted in Figure 2-3.

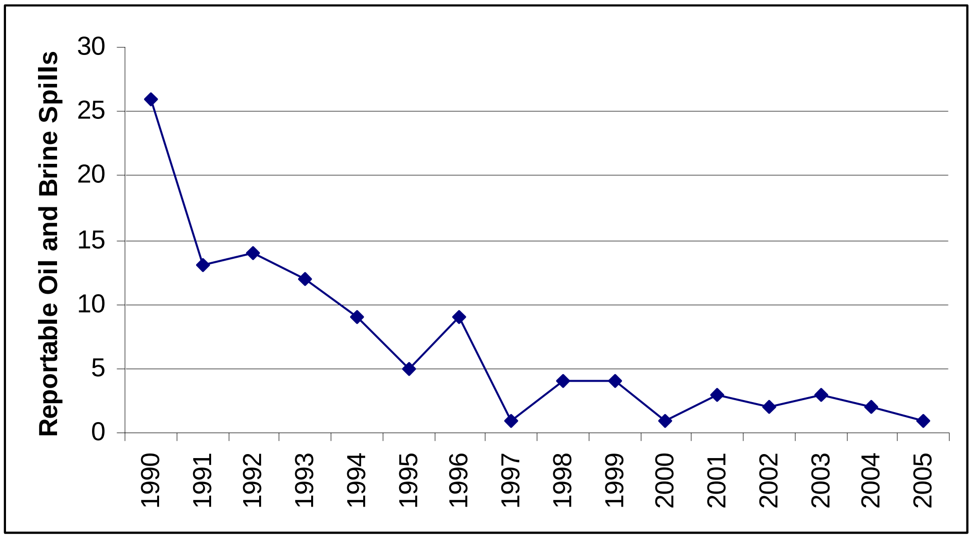


Figure 2-3. Number of Reportable Spills 1990-2005

Table 2-10. Number of Reportable Crude Oil Spills

Year	Total Spills	Volume Spilled m^3 (barrels)	Percent Spilled of Total Throughput
1982	24	847.0 (5,328)	0.00704
1983	21	380.9 (2,396)	0.00281
1984	13	134.8 (848)	0.00119
1985	7	85.4 (537)	0.00122
1986	5	1232.5 (7,753)	0.01041
1987	5	2.5 (16)	0.00002
1988	6	8.8 (55)	0.00001
1989	11	136.4 (858)	0.00004
1990	14	74.8 (467)	0.00003
1991	6	37.9 (237)	0.0004
1992	5	1.9 (12)	0.00006
1993	6	36.9 (232)	0.0007
1994	7	6.2 (39)	0.0003
1995	2	56.3 (354)	0.0006
1996	4	4.7 (30)	0.00002
1997	1	0.32 (2)	4.0×10^{-9}
1998	1	Sheen	N/A
1999	1	31.8 (200)	0.00056
2000	1	11.1 (70)	0.00011
2001	2	1.6 (10)	0.0000163
2002	0	0	0
2003	3	1.1 (7)	0.0000104
2004	0*	0*	0*
2005	0	0	0

* Note: During CY 2004 there were no reportable crude oil spills at the SPR. The spill that occurred during CY 2004 resulted from a sheen due to a diesel fuel spill on a navigable waterway.

Table 2-11. Number of Reportable Brine Spills

Year	Total Spills	Volume Spilled m^3 (barrels)	Percent Spilled of Total Throughput
1982	43	443.8 (2,792)	0.0005
1983	44	259.4 (1,632)	0.0002
1984	17	314.0 (1,975)	0.0003
1985	16	96,494.8 (607,000)	0.1308
1986	7	275.6 (1,734)	0.0017
1987	22	96.5 (608)	0.0003
1988	12	93.8 (586)	0.0001
1989	17	31,231.6 (825,512)	0.1395
1990	12	11,944.3 (74,650)	0.0170
1991	7	1,156.8 (7,230)	0.004
1992	9	48.0 (302)	0.003
1993	6	59.2 (370)	0.001
1994	2	14.4 (90)	0.0006
1995	3	131.1 (825)	0.0028
1996	5	179.7 (1,130)	0.0014
1997	0	0	0.0
1998	3	6.2 (39)	0.00028
1999	0	0	0.0
2000	0	0	0.0
2001	1	0.019 (0.12)	5.60×10^{-7}
2002	2	2.1 (13)	3.9×10^{-6}
2003	0	0	0
2004	1	1.6 (10)	2.2×10^{-7}
2005	1	27 .0 (170)	$5.5\text{x}10^{-6}$

Table 2-12. 2005 Reportable Brine Spill

Date	Location	Amount	Description
06/04/2005	West Hackberry	27.0 m3 (170 bbls)	A site operator reported brine along side of the road where the 12" line goes underground from 24" header to the Brine Disposal Well (BDW) 1 Pad. Maintenance began excavations to collect water and exploratory. Operations began washing out the site vac truck and loaded a partial load of fresh water to washdown the contaminated area. LDEQ notified..

2.3 SUMMARY OF PERMITS (JAN. 1, 2005 THROUGH DEC. 31, 2005)

General

Permits in effect during 2005 include 11 state and federal CWA wastewater discharge permits, six CAA permits, 35 active COE wetlands (Section 404 of CWA) permits (not counting associated modifications and amendments), and over 100 oil field pit, underground injection well, and mining permits. In addition, a number of other minor permits were in effect during the year. Many of these major permits are presented in tabular form in Section 3, Tables 3-2 through 3-7.

Applications to obtain flexible air permits for the Big Hill and Bryan Mound sites were submitted to TCEQ in November 2005. TCEQ requested additional information in December 2005 concerning best available control technology for the Big Hill brine pond and Bryan Mound brine tank.

Permit Compliance

Compliance with environmental permits is assured by meeting the conditions detailed within the permit. These conditions can be monitoring of components or processes, monitoring of pollutant effluents to ensure they meet permit limits, maintaining structures in their original condition, and inspecting facilities.

Air quality operating permits require piping components such as valves, flanges, pressure relief valves, and pump seals be inspected for leaks of VOC on a regular basis (quarterly in Texas and annually in Louisiana) using organic vapor analyzers (OVA). In addition, the Texas permits require that the flanges be inspected visually, audibly, and or by olfactory methods to identify any possible leaks on a weekly basis. All SPR air permits contain permit limitations based on pollutant emission rate in pounds per hour and tons per year.

The SPR ensures compliance with these permit limits by monitoring the processes that emit the pollutants. This includes monitoring use of generators, volumes of crude oil, diesel, and gasoline movements through tanks, volume of painting, and others. The results of this effluent monitoring are reported to the agencies annually at Bryan Mound and Big Hill through an Emissions Inventory Questionnaire (EIQ). Bayou Choctaw and West Hackberry do not require reporting because they are below the required emission limit to report in Louisiana. All air reports were submitted to the appropriate agencies on time.

Water discharge permits require visual monitoring of the effluents to ensure that they have no visible sheen or foaming. Other permit conditions require that analytical permit limits are met and reported. All SPR sites require periodic (daily, monthly and/or quarterly) monitoring of permit limit compliance with quarterly reporting through the NPDES, LPDES, and RCT Statewide Rule 8 Discharge Monitoring Reports (DMRs). All such reports were submitted to the appropriate agencies on time in 2005.

Noncompliances

One discharge permit noncompliance occurred at the SPR out of a total of 2,041 permit-related analyses performed in 2005. This was the result of a BOD sample being outside of the permit parameter limits at Bayou Choctaw. The noncompliance was of short duration and immediately resolved, causing no observable adverse environmental impact.

This Single noncompliance produced an overall project-wide 99.95 percent compliance rate for 2005. Summary information of NPDES exceedances and noncompliances is contained in Section 5.4, Table 5-8.

Environmental Reportable Project Events

Project events equal all reportable spills, both oil and brine and all discharge permit non-compliances. These events are used to provide a summary of SPR performance as illustrated in Figure 2-4. During CY 2005 there were two environmental reportable project events at the SPR.

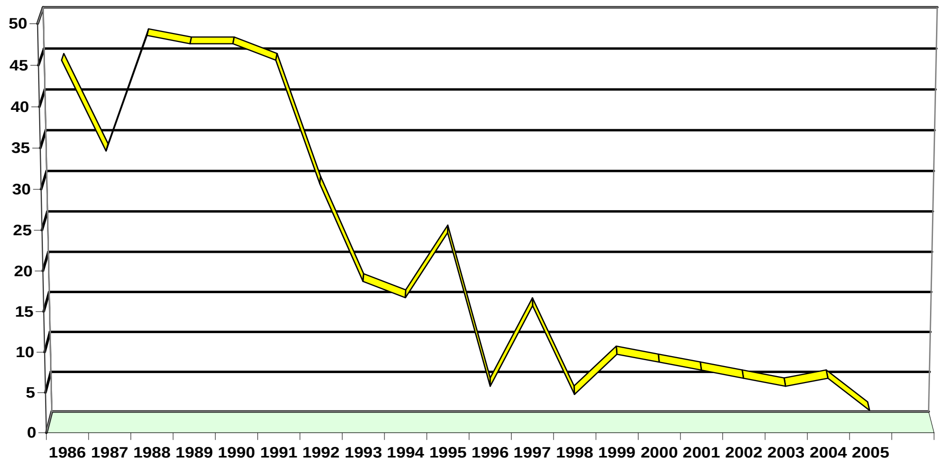


Figure 2-4 SPR Environmental Project Events 1986 - 2005

Notice of Violation (NOV)

During 2005, the SPR continued to maintain a status of low risk to the environment. NOVs have declined significantly from 9 (all administrative) in 1990 to zero since 1995 as depicted in Figure 2-5.

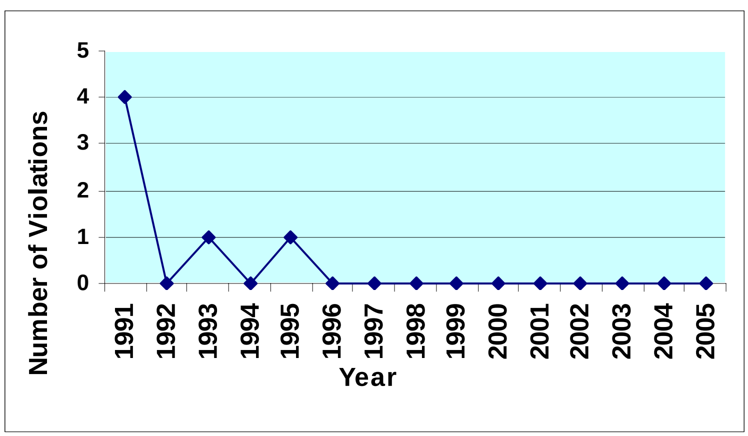


Figure 2-5. Number of Violations 1990-2005

2.4 SUCCESS IN MEETING PERFORMANCE MEASURES

General

Twenty-seven performance measures were tracked in FY 2005. Twenty-one of these targets are identified in contract Work Authorization Directives (WADs) as contract objectives. WAD objectives and targets are jointly developed for each fiscal year by DOE and DM and tracked for success. The other six performance measures were based on an energy management performance agreement referenced by a WAD and environmental commitments made for EPA's Performance Track and TCEQ's Clean Texas programs.

WAD targets that measure environmental success originate from several departments. In FY 2005 nine of the targets tracked were from the Environmental Department. Eleven other targets originating from other departments were also included in the EMS. All performance measures were related to significant environmental aspects or of interests to top management.

A performance measure that is part of the EMS is identified as an environmental "objective." A "target" (a metric that can be measured) is established for each objective. Many objectives have two targets, a "minimum" level (all DOE contractors should meet as a minimum) and a more challenging "target" level.

Success in Meeting Environmental Objectives

The environmental objectives and targets, success in meeting them in FY 2005, and their performance trends since FY 2000 are delineated in Table 2-13.

Of twenty seven environmental objectives tracked in FY 2005, 24 met or surpassed the more challenging "target" level, one surpassed the "minimum" level, but not the target, one did not meet either minimum or target level targets, and one was not applicable to the lack of relevant activity. Most of the environmental objectives have been tracked for several years. The following highlights provide an overview of the 3 to 6 year measurements of success in meeting the targets:

- Consistent improvement in reducing sanitary waste
- Substantial improvement in increasing recycling and the use of the Qualified Products List
- Improvement in reducing permit exceedances, reportable releases, hazardous waste, VOC emissions from degassing crude oil, and providing acreage for wildlife habitat.
- Performance remains "steady" on 14 other objectives that have been tracked for several years
- Performance is fluctuating on reducing lead acquisition and repairing fire systems, and fluctuating slightly on affirmative procurement
- No trends are available yet on two objectives dealing with PREP drills and reducing VOC emissions from workover operations.

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE

OBJECTIVES AND TARGETS								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target**		**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
				Minimum	**Target**			
1	2005-ENV	Discharges	Reduce permit exceedances reported on the Discharge Monitoring Reports	No more than 5/quarter	No more than 3/quarter	Surpassed target. 1 permit exceedance	9 in 2000 4 in 2001 2 in 2002 6 in 2003 3 in 2004 1 in 2005	Improving
2	1.J.1 (ENV)	Spill Discharges Air Emissions Monitoring Wetlands disturbance Drainage Navigation Public exposure	Avoid cited Clean Water Act, Clean Air Act, and RCRA (waste) violations	Not Applicable	0 per year	Met target. 0 violations	0 violations since FY00 and past 8 years.	Steady
3	2004 - ENV	Spill	Reduce reportable occurrences of releases from operational facilities	No more than 10 annually	Less than or equal to 3 per six months	Surpassed target. 1 reportable release	1 in 2000 4 in 2001 1 in 2002 4 in 2003 2 in 2004 1 in 2005	Improving

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE (continued)

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target Minimum**	**Target**	**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
4	2004 TSM – ENGRG	Spill Monitoring and Surveillance Results	In managing the Piping and Pipeline Assurance program, submit semiannual Pipeline and Piping Integrity report by 1/31/05 and 7/31/05	Not Applicable	On schedule	Met target. Done and on schedule	On schedule since 2000.	Steady
5	1.T.1.b (TSM – FP/EM)	Spill	Ensure key emergency equipment is available	90%	100%	Met target. 100%	100% since 2000.	Steady
6	2004 TSM FP-EM	Spill Fire Protection	Ensure basic order agreements are in place for spill response and clean up at each site.	At least 1/site	At least 2/site	Surpassed target. 12 BOAs in place through 2007.	100% since 2001	Steady
7	1.T.1.a (TSM – FP/EM)	Spill Fire Protection	Ensure emergency preparedness and response capabilities through training Emergency Response Team (ERT) members.	85% ERT trained/site. 18 @ BC 20@ BM, BH, & WH	95% ERT trained/site	Surpassed target. 100% trained	97.3% in 2000 96.3% in 2001 100% from 2002 through 2005	Steady
8	2004 TSM FP-EM	Spill Fire Protection	Ensure Incident Commander/Qualified Individual at each site is trained in ICS.	90%	100%	Met target.	100% from 2002 through 2005	Steady

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE (continued)

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target**		**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
				Minimum	**Target**			
9.	1.T.1.c (TSM-FP-EM)	Spill	Successfully complete Preparedness for response Exercise Program (PREP) drills/exercises	Not Applicable	1/site/year	Met target. Completed at BC, BH, and WH. BM scheduled for December.	New Objective	New Objective
10	1.J.2.a (ENV) P-Track and Clean TX programs	Waste	Reduce total amount of hazardous waste generated	Not Applicable	No more than 539 lbs/yr total Fluorescent bulbs: BM: 120 lbs/yr BH: 139 lbs/yr	Surpassed target for SPR, 495 lbs. Surpassed bulb target. BM: 0 lbs BH: 27.5 lbs	3802 lbs in 2000 1712 lbs in 2001 717 lbs in 2002 865 lbs in 2003 1333 lbs in 2004 495 lbs in 2005	Improving substantially.

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE (continued)

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target Minimum**	**Target**	**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
11	1.M.3 (MAINT)	Resource Use	Conduct a predictive maintenance program (PdM) that will identify potential equipment failures.	Achieve 90% weighted average PdM Index each month	Achieve 95% weighted average PdM Index each month	Surpassed target. 99.93%	Completed scheduled PdM activities: 99.5% in 2003 99.98% in 2004 99.93% in 2005	Steady
12	2004 ENV	Monitoring and Surveillance Results	Submit environmental documents on time to DOE & regulators (timeliness & quality)	Not Applicable	100%	Met target. 100%	98% in 2000 100% from 2001 through 2005	Steady
13	1.M.1.a(2) (MAINT)	Spill Air Emissions Waste	Meet weighted average (MPAR) of quality of maintenance, preventive maintenance completion, maintenance support, scheduling effectiveness, productivity, corrective maintenance backlog, and readiness of critical must-operate equipment.	95% MPAR for SPR (all sites) each month.	98% MPAR for SPR (all sites) each month.	Surpassed target. 98.3%	97.3% in 2000 97.6% in 2001 98.5% in 2002 98.4% in 2003 and 2004 98.3% in 2005	Steady

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE (continued)

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target** **Minimum**	**Target**	**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
14	2004 ENV	Waste Spill Air Emissions Resource Use	Review all purchase requests, designs, summaries of work, and other documents sent to Environmental Department for review.	Not Applicable	100%	Met target. 100%	100% from 2001 through 2005	Steady
15	2004 TSM FP-EM	Fire Protection	Ensure fire protection capabilities at each site through prompt Priority One and Two fire protection system repairs.	Average time to complete fire protection repairs equal to completion time of Must-Operate equipment repairs	Average time to complete fire protection repairs less than completion time of Must-Operate equipment repairs	All but BC (for 6 months) and BM (for 1 month) were corrected in less time than Priority 1. Some instances where BM (8 months) and WH (8 months) did not meet Priority 2 time.	Surpassed target (except at BM – Priority 2 only) at all sites in 2002. Surpassed target at all sites in 2003 and 2004. Did not meet targets in 2005.	Declining

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE (continued)

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target Minimum**	**Target**	**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
16	1.H.4.a (SEC)	Spill	Maintain availability of all physical security protection systems	Not Applicable	At least 95%	Surpassed target. 99.8%	98% in 2002 99.6% in second half of 2003 99.7% in 2004 99.8% in 2005	Steady
17	1.J.2.b (ENV)	Waste	Reduce total amount of sanitary waste generated	Not Applicable	No more than 1.7 million lbs/yr	Surpassed target. 402,616 lbs (0.4 million lbs)	636,502 lbs in 2000 607,120 lbs in 2001 484,059 lbs in 2002 449,637 lbs in 2003 437,997 lbs in 2004 402,616 lbs in 2005	Consistently Improving

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE (continued)

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target Minimum**	**Target**	**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
18	2004 ENV	Waste	Increase recycling of sanitary waste through waste diversion	Not Applicable	45%	Surpassed target. 88%	52% in 2000 69% in 2001 40% in 2002 38% in 2003 41% in 2004 88% in 2005	Improving substantially
19	1.J.2.c	Resourc e Use	Increase purchasing of EPA designated recycled content products (affirmative procurement)	95%	100%	Exceeded minimum and approached target.. 98.4%	83% in FY00 87% in FY01 100% from 2002 through 2004 98.4% in 2005	Very slight decline
20	NONE Energy Mgmt. Perf. Agreement	Resourc e Use	Demonstrate progress toward installing cost effective energy conservation measures identified by the Site Building Comprehensive Facility Audits and the E2P2 committee.	$\frac{NMIN}{NMID} \geq 0.20$ NMIN= Number of measures installed. NMID = Number of measures identified.	$\frac{NMIN}{NMID} \geq 0.30$	Surpassed target. 0.40 (40%)	0.444 (44.4%) in 2004 0.40 (40.0%) in 2005	Steady

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE (continued)

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target Minimum**	**Target**	**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
21	NONE Energy Mgmt. Perf. Agreement	Resource Use	Purchase low standby power devices from 5 of the 10 device types identified at http://oahu.lbl.gov/	At least 5 devices	At least 7 devices	Met target. 7 devices purchased.	7 types purchased in 2004 and 2005	Steady
22	2004 TSM PROJ MGMT	Public Involvement	Plan and administer an effective community outreach program. Complete community outreach activities using the Annual Community Outreach Program plan as a baseline.	Complete all activities in accordance with the plan.	Complete activities in addition to those planned.	Surpassed target with additional activities. 103+%	156% in 2002 105.6% in 2003 105+% in 2004 103+% in 2005	Steady

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE (continued)

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target** Minimum	**Target** Target	**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
23	None. P-Track and Clean Texas Programs	Resourc e Use	Reduce lead acquisition via lead acid batteries in electric vehicles by 5%, based on a 2003 procurement baseline. This equals 161 lbs. This is a three year objective to be achieved by the end of CY 06.	Not Applicable	Total: Reduce purchase to no more than 3051.4 lbs/yr BH: no more than 794.2 lbs/yr BM: no more than 250.8 lbs/yr	Surpassed "Total" target so far. Total: 2518.9 lbs purchased BH: 0 lbs BM: 1375.2 lbs – did not meet target	In 2003: Total: 3212 lbs purchased BH: 836 lbs BM: 264 lbs In 2004: Total: 1389 lbs purchased BH: 277.8 lbs BM: 0 lbs In 2005: Total: 2518.9 lbs purchased BH: 0 lbs BM: 1375.2 lbs	Fluctuating, overall. BH dropped dramatically while BM increased dramatically

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE (continued)

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target**		**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
				Minimum	**Target**			
24	None. P-Track and Clean Texas Programs	Air Emissions	Reduce VOC emissions from the cavern workover process at the Texas sites. This is a three year objective to be achieved by the end of CY 06.	Not Applicable	45 tons/yr	Surpassed target, but not through process improvements 26.35 tons (BH only)	In 2004: 17.47 tons/yr or 18.94 tons/yr normalized total BH: 16.8 tons/yr or 8.63 tons/yr normalized BM: 0.67 tons/yr or 10.3 tons normalized In 2005: 26.35 tons/yr or 23.95 tons/yr normalized total, all at Big Hill	Slight increase, but less than target due to reduced activity and not change in methodology.
25	None. P-Track and Clean Texas Programs	Wildlife Exposure	Provide habitat on site to protect wildlife. This is a three year objective to be achieved by the end of CY 06.	Not Applicable	At least 40 acres	Surpassed target. 77 acres set aside at BM, BC, and WH	72 acres in 2004 77 acres in 2005	Increased with 5 acres added from BC

Table 2-13. FY 05 OBJECTIVES AND TARGETS WITH PERFORMANCE (continued)

OBJECTIVES AND TARGETS (continued)								
ID #	**WAD ID**	**Aspect**	**Objective**	**Target**		**Level of Achievement in FY 05**	**Performance Trend (Since FY00)**	**Trend**
				Minimum	**Target**			
26	None. P-Track and Clean Texas Programs	Air Emissions	Through the degasification process, reduce the VOCs from crude oil sent off-site during a model 60 day 60 MMB drawdown at Big Hill. This is a three year objective for Big Hill only, to be achieved by the end of CY 06.	Not Applicable	Reduce by 500 tons	Surpassed target. 454.6 tons avoided.	Reduced by 139.4 tons in 2004 Reduced by 454.6 tons in 2005.	Improved 594 tons avoided overall, and commitment completed
27	Env. Instr. Manual	Waste	Increase use of the Qualified Products List (QPL)	Not Applicable	At least 85% products sampled found as “approved” on QPL	Surpassed target. 94.2%	81.6% found approved in 2004 94.2% found approved in 2005	Improving substantially

3. ENVIRONMENTAL PROGRAM INFORMATION

The environmental program is implemented by the prime M&O contractor for the SPR on behalf of DOE (permittee) and is designed to support the SPR through tasks aimed at avoiding or minimizing adverse environmental effects from the SPR on surrounding lands, air, and water bodies.

The monitoring and inspection program, originally developed under guidance of the SPR Programmatic Environmental Action Report and Site Environmental Action Reports, now conforms to the monitoring program by DOE Order 450.1. This program includes monitoring permitted NPDES outfalls and air emissions, conducting other required federal and state inspections, and surveillance sampling and analysis of site-associated surface and ground water quality. This makes possible the assessment of environmental impacts relative to the baseline and early detection of water quality degradation that may occur from SPR operations.

The results of the individual program areas such as air emissions monitoring and reporting, NPDES compliance, water quality monitoring, and ground water monitoring for 2005 are discussed in sections 5 and 6.

3.1 ASSOCIATED PLANS AND PROCEDURES

Associated plans that support the SPR environmental program include the Emergency Management Plan and Implementing Procedures, the site specific Emergency Response Procedures with spill reporting procedures; the site-specific Spill Prevention, Control, and Countermeasures Plans (SPCC); the Environmental Monitoring Plan (EMP) which incorporates the Ground Water Protection Management Program (GWPMP) plan; and the Pollution Prevention Plan (PPP). The EMP, GWPMP, and the PPP are reviewed and updated annually; the SPCC plans are reviewed and revised as needed or every five years.

Associated procedures that support the SPR environmental program are located in the DM Environmental Instructions Manual. These procedures identify requirements, responsible personnel, deadlines, and governing standards. Each site has developed instructions where needed that implement the environmental program specific to their facility.

The ISO 14001 Environmental Management System Manual was developed to describe and provide direction to DM policies, plans, and procedures that make up the environmental management system and to illustrate how the EMS conforms to the ISO 14001 standard. This document is reviewed and revised at least annually.

3.2 REPORTING

Proper operation of the SPR with respect to the environment involves several types of reports and reporting procedures. The basic reports are summarized briefly in this section.

3.2.1 Spill Reporting

Site Emergency Response Procedures address spill reporting requirements of the SPR contractor, DOE, and appropriate regulatory agencies. Specific reporting procedures are dependent upon several key factors including the quantity and type of material spilled, immediate and potential impacts of the spill, and spill location (e.g., wetland or water body). All spills of hazardous substances are first verbally reported to site management and then through the SPR contractor management reporting system to New Orleans contractor and DOE management. The tool to document these spills is the Operations Control Center (OCC) Non-Routine and Occurrence Report form that is completed at the site level and then forwarded to the New Orleans. Verbal notification and associated written reports to the appropriate regulatory agencies occur as required, if the spill meets the reportable criteria. Final written reports from the sites are submitted after cleanup, unless otherwise directed by the DOE or appropriate regulatory agency.

3.2.2 <u>Discharge Monitoring Reports</u>

Wastewater and storm water discharges from SPR sites are authorized by EPA through the NPDES program; through the LDEQ by the Louisiana Pollutant Discharge Elimination System (LPDES). The EPA has not yet delegated the NPDES program to the Railroad Commission of Texas (RCT) so parallel EPA NPDES and RCT Rule 8 water discharge programs are in place for Big Hill and Bryan Mound. The routine monitoring reports are prepared and submitted in accordance with site-specific permit requirements. All discharge permits issued to the SPR require quarterly reporting to the appropriate agency(s) (LDEQ, or RCT and EPA). Included in each report is an explanation of the cause and actions taken to correct any noncompliance or bypass that may have occurred during the reporting period.

3.2.3 <u>Other Reports</u>

The SPR contractor provides several other reports to, or on behalf of DOE. Table 3-1 contains a comprehensive list of environmental regulations and reporting requirements applicable to the SPR.

Table 3-1. Federal, State, and Local Regulatory Reporting Requirements

Regulation, Statute or Directive	Regulated Area	Enforcement Agency	Types of Required Permits, Applications, or Documentation	Routine Reporting Requirements
Clean Air Act	Control of hydrocarbon emissions from tanks, valves, and piping	TCEQ	Air Emissions Permit	Annual Emissions Inventory Questionnaires
		TCEQ	Air Emissions Permit Special Requirement	Monthly Tank Emissions
Clean Water Act as amended (FWPCA)	Wastewater discharges	U.S. EPA, Region VI	NPDES Permit	Monthly monitoring reports
		LA Dept. of Env. Quality (LDEQ)	Water Discharge Permit	Quarterly monitoring reports
		Railroad Commission of Texas (RCT)	Water Discharge Permit	Quarterly monitoring reports
	Spill Prevention, Control and Countermeasures (SPCC)	U.S. EPA, LDEQ	SPCC Plan	Submit existing plan when spills on navigable waters exceed 1000 gals or occur ≥2x in 1 year
	Discharge notification	LDEQ, TCEQ, RCT, U.S. DOT, EPA	Verbal and written notification	Non-permitted discharges over RQ
	Dredging maintenance, and any construction in wetlands for structures. (Sections 404 & 10)	U.S. Army Corps of Engineers (COE)	Construct & Maintain Permit, Maintenance Notifications	Two-week advance of work start, notice suspension, and end.
	Wildlife refuges	U.S. Fish and Wildlife Service (US F&WS)	Right-of-way for Construction and Maintenance	None
Clean Texas Program, Platinum Level membership	Environmental Management Systems	TCEQ	Applicable environmental requirements, audit results, performance in meeting commitments, and outreach information	Annual progress report. Information on individual Texas facilities is included in the National Environmental Performance track Report

Table 3-1. Federal, State, and Local Regulatory Reporting Requirements (continued)

Regulation, Statute or Directive	Regulated Area	Enforcement Agency	Types of Required Permits, Applications, or Documentation	Routine Reporting Requirements
Coastal Zone Management Act	Wetlands construction within state coastal management zones	Louisiana Dept. of Natural Resources (LDNR), Texas General Land Office (GLO)	Federal project consistency determinations	None
DOE Order 450.1*	Environmental Planning and Monitoring	DOE	Environmental Protection and Implementation Plan	Annual revision
			Ground Water Protection Management Program Plan	Annual review (now contained in EMP)
			Environmental Monitoring Plan	Annual revision
			Site Environmental Report	Annual report
			Performance Indicators	Monthly electronic updates in PB Views data management system and Quarterly report
	Waste Management	DOE	Annual Report on Waste Generation and Pollution Prevention Progress	Annual summary of all wastes
EO 13101	Affirmative Procurement	DOE	Affirmative Procurement Report	Annual report
Federal Migratory Bird Act	Disturbance of bird nests	US F&WS	Special Purpose Permit	As requested by USFWS
Miscellaneous State Environmental Regulations	Use of salt domes	LDNR	Permit for Use of Salt Domes for Hydro-carbon Storage	None
	Water withdrawal from coastal areas	TCEQ	Water Appropriation Permit	Annual Usage Report
	Pipeline usage	RCT	Pipeline and Gathering System Certification (T-4C)	Annual Certification
	Operation of brine ponds	LDNR, RCT	Operate and Maintain Permit	None

Table 3-1. Federal, State, and Local Regulatory Reporting Requirements (continued)

Regulation, Statute or Directive	Regulated Area	Enforcement Agency	Types of Required Permits, Applications, or Documentation	Routine Reporting Requirements
National Environmental Performance Track Program	Environmental Management Systems	U.S. EPA	Applicable environmental requirements, audit results, performance in meeting commitments, and outreach information	Annual progress report
National Environmental Policy Act	Review of proposed projects for environmental considerations	U.S. Council on Environmental Quality (CEQ)	Environmental Impact statements, Environmental Assessments	Only when not tiered under other EIS or EA.
			Categorical Exclusions	For projects that require consent.
Oil Pollution Act of 1990 (amendment of FWPCA)	Oil spill response	U.S. EPA, LDEQ, USCG, TCEQ	Emergency Response Procedures, Oil Spill Response Cert.	None
		U.S. Dept. of Transportation (DOT)	Pipeline Response Plan	None
Oil Spill Prevention & Response Act of 1991	Oil spill response in Texas coastal zone	GLO	Discharge Prevention and Response Plan	Report spills of oil as required
			Discharge Prevention and Response Facility Cert.	Annual review by agency.
Pollution Prevention Act of 1990	Strategy to incorporate pollution prevention into ES&H goals	EPA, DOE	Pollution Prevention Plan, Waste Min Plan, Waste Mgmt Plan, Storm water Pollution Prevention Plan	None
Resource Conservation and Recovery Act	Hazardous waste generation and disposal	LDEQ	Annual Generators Report	Annual report to agency
			LA Notification of HW Activity	New waste stream, change in generator status
			LA Uniform HW Manifest	Complete and submit form with disposal

Table 3-1. Federal, State, and Local Regulatory Reporting Requirements (continued)

Regulation, Statute or Directive	Regulated Area	Enforcement Agency	Types of Required Permits, Applications, or Documentation	Routine Reporting Requirements
Resource Conservation and Recovery Act (continued)	Hazardous waste generation and disposal (continued)	RCT	TX Uniform HW Manifest	Complete and submit form with disposal
			Oil and Gas Waste Report	Annotate Report to Agency
			Texas Notification of hazardous waste activity	New waste stream or change in generator status
	Used oil burned for recovery	LDEQ, RCT	Uniform HW Manifest (Recycling)	Complete and submit form with disposal
	Non-hazardous oilfield waste disposal (exploration and production)	LDNR	Non-Hazardous Oilfield Waste Shipping Control Ticket (UIC-28)	Complete and submit form with disposal
	Non-hazardous special	LDEQ, TCEQ	Shipping Paper	Complete and submit form with disposal
	Waste Management	LDEQ, TCEQ	Monthly waste inventory form	Complete for documentation
			Weekly waste inspection form	Complete for documentation
	Affirmative Procurement	EPA	Affirmative Procurement Report	Annual Report
Safe Drinking Water Act	Cavern formation, well workovers, and salt-water disposal wells	LDNR, Office of Conservation, Under-ground Injection and Mining Division	Well Work over Permit (WH-1)	Well Work over Report
			Cavern Inspection (29-M)	Semi-annual Cavern Inspection Report
			Saltwater Disposal (UIC-10)	Annual Saltwater Disposal Well Report
			Cavern Integrity Test Report	Annual Cavern Integrity
			Oil Wells Integrity (W-10)	Annual Oil Well Status Report

Table 3-1. Federal, State, and Local Regulatory Reporting Requirements (continued)

Regulation, Statute or Directive	Regulated Area	Enforcement Agency	Types of Required Permits, Applications, or Documentation	Routine Reporting Requirements
Safe Drinking Water Act (continued)		RCT	Brine Injection Permit (H-10)	Annual Disposal/ Injection Wells Reports
	Potable water	LA Dept. of Health & Hospitals (LDHH)	Daily Chlorine Residual Concentration (BC) Quarterly total coliform test (BC) Quarterly disinfectant and disinfectant by-products test (BC)	Retain on site Retain results on site Submit to LDHH
		TCEQ	Weekly disinfectant residual concentration (BM and BH) Monthly total coliform test (BM and BH) Annual disinfectant and disinfectant by-products test (BM)	Monthly Retain results on site Submit to TCEQ
	Storage of oil in underground salt domes	LDNR, RCT	Storage permit	None
Superfund Amendment Reauthorization Act	Reporting of inventories of hazardous substances and materials stored on site	Louisiana Dept. of Public Safety and Corrections, Texas Dept. of Health	Title III, Tier II	Annual Inventory Report
	Reporting of discharges of all listed hazardous materials	EPA	Toxic Release Inventory, Form R	Complete and submit form when threshold exceeded

***Note: Reporting requirements changed as the result of the replacement of DOE Order 5400.1 with DOE Order 450.1.**

3.3 ENVIRONMENTAL PERMITS

The active environmental permits required by regulatory agencies to construct, operate, and maintain the SPR are discussed by site.

The SPR holds a general permit to discharge hydrostatic test water in the state of Louisiana that applies to all of the Louisiana SPR sites, and their offsite pipelines. This permit requires quarterly discharge monitoring reporting.

LDEQ has primacy for the NPDES program in Louisiana that includes responsibility for all compliance and enforcement actions relating to the discharge of water in Louisiana. The LDEQ-issued general storm water permit coverage replacing expired federal MSGP for the two active Louisiana sites remained in-force throughout CY2005.

Since the RCT does not have primacy for the NPDES program, Big Hill and Bryan Mound operate under parallel EPA and RCT discharge permits. In addition to maintaining federal coverage, the two Texas SPR sites operate under authority granted with Statewide Rule 8 water discharge permits issued by the RCT. Both of the Texas site permits were modified in 2005 to coincide with the federal NPDES nozzle exit velocity change to 30 fps. Also during 2005 the sites completed Notices of Intent (NOI’s) and operated under the EPA Multi-sector General Permit (MSGP) for their sheet-flow (non-point source) storm water associated with industrial activity.

The Certification of No Exposure processed to the MDEQ for the new Mississippi Stennis Warehousing operations in lieu of MSGP stormwater coverage at that location was confirmed active and in-force during CY2005.

The air permits for the SPR facilities are administered by the LDEQ in Louisiana and the TCEQ in Texas. The Bayou Choctaw and West Hackberry air permits did not require modification or renewal in CY2005. Applications to obtain flexible air permits at Big Hill and Bryan Mound were submitted to TCEQ in November 2005. TCEQ requested additional information in December 2005 concerning best available control technology at the Big Hill brine pond and the Bryan Mound brine tank.

3.3.1 Bayou Choctaw

Table 3-2 lists the permits at Bayou Choctaw. Individual work permits are received from the Louisiana Underground Injection Control Division of LDNR for each well work over performed. State inspectors periodically visit the site to observe SPR operations. Bayou Choctaw operates under the water and air programs delegated to Louisiana by EPA.

Blanket fees and basic renewal information were supplied in 2005 to the Department of Health and Hospitals for the continued certified operations of the Bayou Choctaw potable water system.

A renewal application for the sites' expiring LPDES permit was prepared and provided to LDEQ on April 20, 2004. The application was found administratively complete, thereby extending the authority to discharge until a renewal is issued. LDEQ did not complete permit renewal in CY2005.

Table 3-2. Permits at Bayou Choctaw

PERMIT NUMBER	ISSUING* AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
LA0053040	LDEQ	LPDES	11/1/99	10/31/2004	(1)
LAR05M557	LDEQ	LPDES	01/24/01	4/30/06	(2)
1280-00015- 02	LDEQ	Air	12/2/99	Open	(3)
None	LDNR	Injection	01/11/83	Open	(4)
SDS-1	LDNR	Injection	09/09/77	Open	(5)
LMNOD-SP (Bull Bay) 3	COE	Constr. & Maintain	01/30/79	-	(6)
LMNOD-SP (Iberville Parish Wetlands) 7	COE	Constr. & Maintain	09/26/77	-	(7)
LMNOD-SP (Iberville Parish Wetlands) 10	COE	Constr. &Maintain	06/12/78		(8)
LMNOD-SP (Iberville Parish Wetlands) 17	COE	Constr. & Maintain	11/06/78	-	(9)
LMNOD-SP (Iberville Parish Wetlands) 31	COE	Constr. & Maintain	05/27/80	-	(10)
LMNOD-SP (Iberville Parish Wetlands) 102	COE	Constr. & Maintain	09/26/77	-	(11)
WN-20-020-0168	COE	Constr. & Maintain	04/02/02	-	(12)
WT-20-020-2654	COE	Constr. & Maintain	08/20/02	-	(13)
WT-20-020-3621	COE	Constr. & Maintain	09/17/02	-	(14)
LMNOD-SP (Bayou Plaquemine)	COE	Constr. & Maintain	09/26/77	-	(15)
CT-20-030-1379-0	COE	Constr. & Maintain	03/12/03	-	(16)
CT-20-030-1501-0	COE	Constr. & Maintain	03/28/03	-	(17)
CT-20-030-3087-0	COE	Constr. & Maintain	07/25/03	-	(18)
MVN-2004-4453-CT	COE	Constr. & Maintain	10/14/04		(19)

(1) LDEQ obtained primacy and issued an LPDES permit with former NPDES number in 1999. An acceptably complete renewal application was provided LDEQ as required 180 days prior to expiration which resulted in the permit being administratively extended until LDEQ renewal is completed.

(2) LPDES Multi-Sector General Permit (MSGP) coverage for Storm Water Associated with Industrial Activity obtained as a renewal with a NOI dated 1/22/01; coverage was automatic 48 hours after postmark. State issued LPDES permit in May 2001.

(3) Site air operating permit modified 12/99

(4) Letter of financial responsibility to plug and abandon injection wells.

(5) Permit approved use of salt dome cavities for storage of liquid hydrocarbons.

(6) Maintain Bull Bay 24" brine disposal pipeline recorded with applicable Registrar of Deeds.
(7) Construct and maintain well pads (brine disposal wells).
(8) Enlarge existing well pads and construct access roads (brine disposal wells 1, 2, & 3.)
(9) Construct and maintain access road to brine disposal well area. NOTE: brine disposal pipeline was constructed under NWP authority and maintenance is allowed in conjunction with the access road permit. Major maintenance performed in 1996.
(10) Construct and maintain well pad, levees, access road & appurtenances to Cavern 102 and additional bank stabilization, warehouse pad and culvert per additions of 1983.
(11) Construct and maintain ring levee, drill site and appurtenances, Well 101.
(12) Install and maintain fill with culverts for parking. Permit authorized a construction period until 4/30/2007.
(13) Install and maintain culverts and fill to construct minor roadway crossings. Activity authorized under NWP-14 and provides a construction period until 8/20/2004.
(14) Replace, repair and maintain security fence with concrete footing and curbing. Activity authorized under NWP-3 and provides a construction period until 9/17/2004.
(15) Install and maintain 36-inch petroleum products pipeline under and across Bayou Plaquemine
(16) Install and maintain a replacement N-S bridge for an existing, permitted N-S bridge on the Main Site. Activity authorized under NWP-3; provides a construction period until 3/12/2005.
(17) Install and maintain a replacement brine disposal access road bridge for an existing permitted structure on the brine disposal access road. Activity authorized under NWP-3, provides a construction period until 3/28/2005.
(18) Install and maintain a bulkhead and fill for bank stabilization in the North-South Canal on the Main Site. Activity authorized under NWP-13 providing a construction period until 7/25/2005.
(19) Install and maintain refurbished Bailey Bridge crossing over Wilbert's Canal via NWP14, providing construction period for 2 years.

3.3.2 Big Hill

Table 3-3 lists the permits at Big Hill. In 2004, the site appropriated 373,124m^3 (303 acre-feet) of water from the Intracoastal Waterway exclusive of water for fire protection. This represents only 1.0 percent of the recently revised total allowable withdrawal for a year. The certified affidavit and annual report of water usage was forwarded to the TCEQ as required in 2005.

The forms T-4C were forwarded to the appropriate branch of the Railroad Commission of Texas (RCT) in early November 2005, for the Big Hill crude oil pipeline distribution system.

The NPDES permit required brine line integrity test demonstrated integrity and the results were provided EPA Region 6 during the calendar year 2005.

Both agencies holding water discharge permits for the Texas sites concurred with the addition of corrosion inhibiting chemicals in low concentrations in the raw water ahead of the heat exchanger units, under the condition of Presidential drawdown, under EPA's renewed authority in 2003, and, under state authority effective in 2005.

The M&O contractor is registered with TCEQ as a Public Water System Operations Company (registration # WC0000073) since Big Hill (and Bryan Mound) provides sanitary control of their purchased water distribution system on-site. A status report, including current licensed water operators, was submitted to TCEQ in 2005

Permit modification requests were made to both EPA and RCT requesting increase of the minimum brine diffuser nozzle exit velocity from 20 to 30 fps to increase dispersion in the Gulf of Mexico and to improve the permitted Critical Dilution Factor for the Whole Effluent Toxicity testing. Due to a favorable compliance record for this parameter a frequency reduction became available for the same WET testing, and was also processed. These permit modifications were completed and made effective in February, 2005.

The U.S. Army Corps of Engineers, Galveston District (GALCOE) authorized field repairs to the Big Hill brine disposal pipeline and to relocate a 34.5kV power transmission line underground using nationwide authority in 2005. The three separate projects commenced in CY2005 but were not completed by year-end.

An application to obtain a flexible air permit at Big Hill was submitted to TCEQ in November 2005. TCEQ requested additional information in December 2005 concerning best available control technology at the Big Hill brine pond.

Table 3-3. Permits at Big Hill

PERMIT NUMBER	ISSUING AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
TX0092827	EPA	NPDES	11/01/03	10/31/08	(1)
NOI	EPA	NPDES	01/24/01	09/2005	(2)
SWGCO-RP 16536 (01,02,03,04, 05)	COE	Constr. & Maintain	01/11/84	- Dredging clause to 12/2008	(3) (4)
P-7	F&WS	Constr. & Operate	07/31/86	06/30/2036	(5)
9256	TCEQ	Air	04/22/98	04/22/2008	Site Air Permit
51839	TCEQ	Air	08/15/02	08/15/2012	Degas Permit
02939	RCT	Operate	11/28/83	Open	(6)
P000226A & P000226B	RCT	Operate/ Maintain	09/19/84	Open	(7)
0048295, 0048320, 004816, 004817	RCT	Operate	05/09/83 06/23/83	Open Open	(8)
UHS-006	RCT	Water Disch.	01/01/05	12/31/2009	(9)
4045A	TNRCC	Water Use	11/14/83	Open	(10)

(1) Renewal submitted 11/24/93 - accepted as administratively complete 12/22/93. Acted upon through 2002 and 2003 with final permit issued in September 2003, effective 1NOV03.
(2) NPDES Multi-Sector General Permit (MSGP) coverage for Storm Water Associated with Industrial Activity expired in October 2005 and was automatically extended by EPA until a renewed permit is made effective.
(3) Permits and modifications to construct and maintain RWIS, raw water 48" pipeline, brine disposal 48" pipeline, crude oil 36" pipeline. Maintenance dredging clause renewed until 12/31/08. Modified in 1996 for new integrity test method.
(4) Completion of raw water, brine disposal, and crude oil pipeline extended. Amended to install offshore pipeline by trenching.
(5) Completion of pipeline construction extended. (48" Brine Pipeline)
(6) Pipeline distribution system registration to operate crude oil lines. Renewed annually.
(7) Permits to operate and maintain anhydrite and brine/oil pits. Modifications are on file.
(8) Permits to create, operate, and maintain an underground hydrocarbon storage facility consisting of 14 caverns.
(9) Corresponds to TX0092827 (EPA-NPDES). Permit renewed 12/30/2004 with an effective date of 1/1/05.
(10) Permit amended in 1990 to allow for annual diversion of no more than 117,291 acre feet of water and to authorize diversion until termination of the project as a SPR operation. Modified in 1996 to reduce water set aside down to 30,000 ac/ft per year. Maximum Diversion Rate 175 cfs.

3.3.3 Bryan Mound

Table 3-4 lists the permits for the Bryan Mound site. The Bryan Mound site has a permit from TCEQ for the appropriation of state waters for the leaching program, site utility, and fire protection systems. The permit requires a yearly report of the quantity of water used. In 2005, the site used a total of 200,110 m^3 (162 acre-feet) of water from the Brazos River Diversion Channel, representing only 0.3 percent of the annual water usage authorized. The certified affidavit and annual report of water usage was forwarded as required in 2005.

During 2005 a single notification for maintenance dredging in the approach channel to the RWIS was made for COE permit 12347 (as amended in 1995).

Permit modification requests were made to both EPA and RCT requesting increase of the minimum brine diffuser nozzle exit velocity from 20 to 30 fps to increase dispersion in the Gulf of Mexico and to improve the permitted Critical Dilution Factor for the Whole Effluent Toxicity testing. Due to a favorable compliance record for this parameter a frequency reduction became available for the same WET testing, and was also processed. These permit modifications were completed and made effective in February, 2005.

Required reporting for 2005 involved the successful annual brine line integrity test to Region 6 EPA, wastewater operators' reports to TCEQ; and crude oil pipeline system operations renewal to the RCT.

The M&O contractor registered with TCEQ as a Public Water System Operations Company (registration # WC0000073) since Bryan Mound (and Big Hill) provide sanitary control of their purchased water distribution system on-site. A status report, including current licensed water operators, was submitted to TCEQ in 2005.

An application to obtain a flexible air permit at Bryan Mound was submitted to TCEQ in November 2005. TCEQ requested additional information in December 2005 concerning best available control technology at the Bryan Mound brine tank.

Table 3-4. Permits at Bryan Mound.

PERMIT NUMBER	ISSUING AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
TX0074012	EPA	NPDES	11/01/03	10/31/08	(1)
NOI	EPA	NPDES	01/24/01	09/2005	(2)
SWGCO-RP-12347 (03)	COE	Constr & Maintain	02/22/78	-Dredging clause open to 12/2006	(3)
3-67-782 (Docket#)	RCT	Injection	08/21/78	Open	(4)
3-70-377 (Docket#)	RCT	Injection	12/18/78	Open	(4)
P001447	RCT	Operate	10/30/84	Open	(5)
3681A	TNRCC	Water Use	07/20/81	Open	(6)
UHS-004	RCT	Water Disch	04/01/04	03/31/09	(7)
82-8475	TDH&PT	Constr.	01/01/83	Open	(8)
SWGCO-RP-11666	COE	Constr. & Maintain	10/15/77	-	(9)
SWGCO-RP-12112	COE	Constr. & Maintain	07/25/77	-	(10)
SWGCO-RP-12062 (03)	COE	Constr. & Maintain	10/10/78	-	(11)
SWGCO-RP-14114 (01)	COE	Constr. & Maintain	05/18/85	-	(12)
SWGCO-RP-16177	COE	Constr. & Maintain	09/07/82	-	(13)
SWGCO-RP-13435 (01)	COE	Constr. & Maintain	05/21/79	-	(14)
04994	RCT	Operate	08/01/00	-	(15)
6176B	TCEQ	Air	06/12/02	06/12/12	Site Air Permit
52962	TCEQ	Air	11/07/02	11/07/12	Degas Permit

(1) Renewal submitted 03/03/00. Accepted as administratively complete 05/22/00. Acted upon through 2002 and 2003 with final permit issued in September 2003, effective 1NOV03.
(2) NPDES Multi-Sector General Permit (MSGP) coverage for Storm Water Associated with Industrial Activity expired in October, 2005, and was administratively extended by EPA until a renewed permit is made effective.
(3) Maintenance dredging of raw water intake extended to 12/31/06. (SWGCO-RP 12347 authorized construction of RWIS). Extension/renewal authorizes spoil area addition.
(4) Approval of oil storage and salt disposal program.
(5) Authority to operate brine pond.
(6) Permit expires after at project end, covers 52000 ac/ft/yr and MDR of 130 CFS per 2001 amendment.
(7) Corresponds with TX0074012 (EPA-NPDES). (Renewal submitted 12/9/03, RCT acted on permit in March, ‘04, effective 4/1/04.)
(8) Corresponds with SWGCO-RP-16177.
(9) For 30-inch crude oil pipeline to 3 miles SW from Freeport
(10) For 30-inch crude oil pipeline to 2 miles S from Freeport

(11) For 36-inch brine disposal pipeline & diffuser. Revision/amendment (01) deleted special condition (a) requiring maximized deep well injection; (02) approved construction of 24-inch replacement pipeline and diffuser in January 12, 1993. (03) Added the offshore additions the new integrity test method.
(12) General permit for pipeline crossings by directional drilling in navigable waters
(13) Place an 8-inch water line (PVC, potable)
(14) For construction of cavern pads 101, 102, 103, 111, and 113 in wetlands. Mod.01 added access road and fill placement for DCS-2.
(15) Pipeline distribution system registration to operate crude oil lines. Renewed annually with T-4C.

3.3.4 St. James

The SPRPMO successfully completed a twenty year long-term leasing arrangement for use of the St. James site by the private corporation Shell Pipeline in 1997. Shell Pipeline retains all responsibility for maintaining necessary permits at St. James concurrent with their lease.

3.3.5 Stennis Warehouse

There are no permits for the Stennis Warehouse facility. A certificate of No Exposure, declaring that all activities are conducted in a manner that will not expose potential pollutants to stormwater, was submitted to the Mississippi Department of Environmental Quality (MDEQ) in lieu of operating under a multi-sector general permit. Air emissions from Stennis Warehouse operations are de minimus, requiring no permitting or reporting activity.

3.3.6 Weeks Island

The permits for Weeks Island are listed in Table 3-5.
Long-term ground water monitoring implemented for the SDS-8 supplement was completed in 2004 on the 5-year post decommissioning monitoring anniversary. In 2005 the overall monitoring program was determined to be complete by LDNR per a concurrence letter dated October 31, 2005. As a result no physical monitoring or sampling activities occurred in 2005.

Table 3-5. Permits at Weeks Island

PERMIT NUMBER	ISSUING AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
SDS-8	LDNR	Injection	02/16/79 revised for post closure 9/99	Terminated	(1)
SDS-8 Supplement	LDNR	Decommission Supplement	9/1/99	Open	(2)

(1) Approval for use of salt dome cavities for storage of liquid hydrocarbons.
(2) Supplement for the decommissioning activities as modified to reflect completion of decommissioning monitoring.

3.3.7 West Hackberry

Since renewal of the discharge authority, with an effective date of November 1, 2004, the site began operation in 2005 with a streamlined monitoring approach. The new approach based upon the site's previous exemplary compliance history, is three "traditional" named and limited outfalls, with all of the site's former retained stormwater outfalls no longer individually named and limited, but rather addressed under the written Storm Water Pollution Prevention Plan (SWPPP) required by the state's Multi-Sector General Permit.

A single COE permit maintenance notification was processed during this calendar year for traveling screen work on the site's RWIS.

Permits for West Hackberry are listed in Table 3-6.

Table 3-6. Permits at West Hackberry

PERMIT NUMBER	ISSUING AGENCY	PERMIT TYPE	EFFECTIVE DATE	EXPIRATION DATE	COMMENTS
LA0053031	LDEQ	LPDES	11/1/04	10/31/09	(1)
LAR05M559	LDEQ	LPDES	01/24/01	04/30/06	(2)
LMNOD-SP (LTCS) 26	COE	Constr.& Maintain	02/08/79	-	(3)
LMNOD-SP (Black Lk) 31	COE	Constr.& Maintain	10/26/82	-	(4)
LMNOD-SP (Black Lk) 43	COE	Constr.& Maintain	07/26/84	-	(5)
LMNOD-SP (Gulf of Mexico) 2574	COE	Constr.& Maintain	08/11/80	-	(6)
LMNOD-SE (LTCS) 40	COE	Constr.& Maintain	05/25/88	-	(7)
LMNOD-SP (Cameron Parish Wetlands) 162	COE	Constr. & Maintain	03/09/78	-	(8)
SDS-9	LDNR	Injection	08/07/79	Open	(9)
None	LDNR	Injection	01/11/83	Open	(10)
971198-9	LDNR	Injection	09/27/83	Open	(11)
0560-00019-02	LDEQ	Air	11/24/97	Open	-
SWGCO-RP-12342	COE	Constr. & Maintain	03/28/78	-	(12)
LMNOD-SP (Cameron Parish Wetlands) 152	COE	Constr. & Maintain	03/16/78	-	(13)
LMNOD-SP (Cameron Parish Wetlands) 276	COE	Constr. & Maintain	02/11/80	-	(14)
WN20-000-3972-0	COE	Constr. & Maintain	8/31/00	-	(15)
WO-20-020-1136	COE	Constr. & Maintain	01/25/02 02/19/02	-	(16)
WO-20-020-3607	COE	Constr. & Maintain	10/23/02	-	(17)
WW-20-030-3748	COE	Constr. & Maintain	10/22/03	-	(18)

(1) LDEQ obtained primacy and issued and LPDES permit with former NPDES number. Renewed in 2004.
(2) LPDES Multi-Sector General Permit (MSGP) coverage for Storm Water Associated with Industrial Activity obtained as a renewal with a NOI dated 1/22/01; coverage was automatic 48 hours after postmark State issued LPDES permit in May 2001.
(3) Maintenance dredging for raw water intake.
(4) Maintenance dredging for firewater canal and extended boat slip access amendment of 1993.
(5) Construction of erosion control dike completed in 1986. Maintenance dredging open until 7/26/94; addition of riprap amendment of 1993 open until 1995.
(6) Amended to install parallel pipeline (05/29/86).
(7) Permit to construct and maintain 36" crude oil pipeline from site to Texoma/LC Meter Station.
(8) Permit to maintain 42" crude oil pipeline.
(9) Approval to create 16 additional salt dome cavities
(10) Letter of financial responsibility to close all injection wells on this site
(11) Approval to construct and operate wells 117A and B.
(12) For 42" crude oil pipeline crossings of waters & waterways in Texas
(13) For brine disposal wells, well pads, and brine disposal pipelines, (12", 20", & 24")
(14) For well pads, levees, and access roads (Wells 110, 111, 112, 113, 114, & 115)
(15) Category I programmatic general permit. Repair exposed 42-inch crude oil pipeline.
(16) Restore riprap along the north perimeter dike adjacent to Cavern 6 and Black Lake. Permit authorized a construction period until 1/25/2007.

(17) Deposit fill in the fire ditch. Permit authorized a construction period until 10/23/2007.

(18) Modifications to the existing Boat Ramp; and, re-establishment of the erosion control breakwater in Black Lake along the north side of the site. Authorizes construction period until October 31, 2008 and includes an associated Water Quality Certification and Federal Consistency Determination for the activity.

3.4 WASTE MINIMIZATION PROGRAM

The waste minimization program reduces the generation of all wastes including hazardous, non-hazardous sanitary, and Exploration & Production (E&P) wastes. There were no shipments of hazardous waste from the SPR sites during CY 2005. The SPR sent 189.9 mt (418,553 lbs.) of sanitary waste off-site for disposal during CY2005.

The SPR successfully met the hazardous and non-hazardous sanitary waste generation targets and did not exceed 539 and 1,600,000 lbs respectively. Although E&P wastes are not included in these targets, the SPR recycled 597.3 mt (658.4 tons) of wastes generated by the E&P process during 2005. DM environmental staff members were able to assist in this success by a thorough review of the potential waste streams, evaluation of all possible recycling alternatives, communication with SPR site personnel, and consultation with federal and state regulatory agencies as required.

Materials and respective amounts recycled during CY 2005 are delineated in Table 3-7.

Table 3-7. CY 2005 Materials Recycled from all SPR Sites

Recycled Material	Recycled (lbs)	Recycled (metric tons)
Aluminum Cans (including co-mingled w/plastics	1,229	0.56
Antifreeze	34,349	15.58
Ballasts, Non-PCB	221	0.10
Batteries, Pb/Acid	9,502	4.30
Batteries, Non-Pb/Acid (including alkaline, Lithium, NiCd)	337	0.15
Bulbs (all style bulbs including fluorescent, incandescent, etc.)	2,137	0.97
Construction Debris	29,880	13.55
E&P	1,316,876	595.87
Iron, Scrap	1,000	0.45
Fuel & Oil Filters	231	0.10
Miscellaneous, N.O.S.	541	0.25
Paper/Cardboard	96,165	43.62
Toner Cartridges	2,770	1.26
Concrete	1,728,000	783.80
Used Oil Burned for Energy Recovery	9,858	4.47
TOTAL	**3,233,096**	**1,465.03**

The SPR Chemical Management Program is successful in restricting use of chemical products to those that are more environmentally friendly. One of the key tools to select chemical products is the SPR Qualified Products List.

In February 2005, the Performance Improvement Team: Acquisition and Management of Chemicals on the SPR was chartered. In response to auditing findings of non-compliant chemical purchases, the team evaluated controls that restrict acquisition. The team proposed eight improvements to the process:

- Combined environmental and safety review of all MSDSs prior to purchase
- Allowing only a restricted few (quick pick “approved”

chemical list),

- Modification the nomenclature between the SPR catalogue and the QPL,
- Enhancements to the purchasing forms
- Improvements to procedures as well as development of a work instruction
- Improve ESH product categories,
- Enhance the BST program
- Use of the business software (SAP) to enhance the QPL program.

These improvements were successfully implemented in 2005. Other improvements expected to be implemented in 2006 include:

- Establish joint consolidated Env. & Safety review of Material Safety Data Sheets
- Allow only restricted few (quick pick-list of chemicals approved for purchase)
- Fix nomenclature among systems (catalogue, QPL and product MSDS)
- Develop ESH product categories
- Fix procedures across SPR (financial procedures and develop QPL work instruction)
- Improve purchase forms (petty cash and request for check)
- Enhance Behavioral Safety Program(add positive behaviors for acquisition & management of chemicals)

3.5 POLLUTION PREVENTION (P2)

The purpose of the SPR P2 program is to integrate P2 activities into all SPR operations, support technology development programs aimed at minimizing multimedia waste generation, and coordinate P2 efforts with SPR sites. All SPR employees have responsibility under the P2 program.

The P2 Advocates Team, composed of staff from across the SPR disseminate awareness throughout the SPR. P2 announcements and suggestions are communicated via scheduled conference calls and the SPR electronic banner. P2 conference minutes, news articles, and program updates are published on the DM Environmental Webpage, which is available to all SPR employees.

In 2005, the SPR continued its aggressive integration of the P2 and EMS programs into its business operations, providing both cost savings and pollution reduction. As a result, the SPR received the White House Closing the Circle Honorable Mention Award for Preventing Downstream Emissions Through Sustainable Product Stewardship. The SPR also received the DOE P2 Star Award and the DOE "Best in Class P2 Award" for Degassing Crude Oil to Reduce Emissions from Customer Facilities. In addition, each of the SPR Louisiana sites was recognized for the third consecutive year by the Louisiana Quality Foundation for Environmental Excellence. No other facility in Louisiana has duplicated this accomplishment.

In recognition of Earth Day, P2 information was distributed by email to all SPR employees throughout the week leading up to Earth Day. A slide presentation underscoring the importance of environmental stewardship was also distributed to all the SPR employees on behalf of the children of SPR employees.

The Big Hill site employees coordinated with a local boy scout

troop to clean up a one mile section of McFadden Beach near High Island, collecting 15 bags of trash including lots of balloons, an old tire, and even a boogie board. The scouts participate twice each year in the beach cleanup through Chambers County. Participating SPR employees and students were presented an environmental award for their commitment.

Bryan Mound employees participated in the bi-annual Adopt -A - Beach program, sponsored by the Texas General Land Office, cleaning Mile 8 in Surfside, Texas, and documented the types and origins of the trash. This mile section of the beach is officially adopted by Bryan Mound SPR Employees along with the Freeport Area Swim Team.

SPR Vanpooling was evaluated for the New Orleans complex and is anticipated to be implemented in 2006. The potential benefits of the federal Commuter Choice program include: reduced air emissions, reduced consumption of fossil fuels, employee incentives program, enhanced employee safety and well-being, and realized cost savings to participants.

The SPR, a recognized leader in environmental stewardship integration with its business operations, implemented results of a design Charrette for “Green Building” requirements. The team overcame accelerated schedules, cost constraints, emergency distribution of crude oil, and two major hurricanes to: 1) score one building “silver”, 2) identify SPR green specifications, and 3) establish a sustainable building model for future SPR projects. The Green Building Design exercise provided the SPR Green Building experience and knowledge while reaping some sustainable building design benefits including: 1) recycling approximately 40 cubic yards of gypsum drywall and mineral fiber ceiling tile by grinding and processing the materials into a feedstock for beneficial uses such as mulch and/or soil stabilizers for gardening and landscaping projects, 2) salvaged bathroom fixtures and toilets for redistribution in the surrounding community, 3) donating ten sets of plumbing fixtures to Habitat for Humanity, 4) recycling additional 13,000 lbs of scrap metal, and 5) deconstruction and reuse of 91 permanently installed energy efficient green certified ballasts and lamps.

As part of outreach, the SPR communicated environmental activities such as participation in Beach Sweeps, the Brazoria County Dune Restoration Project by Reuse of Christmas Trees, and creation of an employee gardening club through email folders, the SPR electronic banner, newsletter articles, and the environmental webpage.

All SPR employees generate waste and are responsible for properly managing it, requirements, completing corresponding training, and complying with procedural and contractual requirements to minimize its generation. To achieve waste minimization/reduction, the SPR promotes the use of non-hazardous substitutes, prevention of spills, and proper management of those wastes generated. These and other P2 activities are incorporated in the design, construction, operation, and maintenance of all projects and activities.

SPR employees are trained on buying items with recycled content in accordance with the Comprehensive Procurement Guidelines (CPG), which is EPA's continuing effort to promote the use of materials recovered from solid waste. DM employees empowered to make purchases are required to take a computer based training (CBT) course on Affirmative Procurement on an annual basis. This helps ensure that the materials collected in recycling programs will be reused again in the manufacture of new products. In 2005, the SPR continued to streamline the tracking system of purchases in its automated systems.

In 2005, the SPR again achieved 100 percent success for purchasing Affirmative Procurement products, helping to fulfill the SPR target Pollution Prevention Goal to increase purchases of EPA-designated items with recycle content, as referenced in Section 2.

3.6 INTEGRATED SAFETY MANAGEMENT (ISM)

The Environmental Management System (EMS) is the environmental leg of ISM that is integrated throughout all SPR activities. The SPR ISM utilizes the EMS to infuse ISM principles throughout the environmental program. In the same regard EMS elements are directed up through the overarching ISM system.

3.7 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

An EMS is the environmental component of ISM and complies with provisions of executive order 13148 and DOE Order DOE O 450.1. Environmental considerations are interwoven into management and work programs and practices at all levels so as to achieve DOE's mission while achieving prevention of pollution, continuous improvement, and compliance with requirements. By integrating the NEPA process into the EMS, the SPR enhances protection of the environment and manages its environmental obligations in a safe and effective manner. Protection of the public and the environment is achieved throughout all phases of a project beginning with a formal NEPA review at the conceptual stage of a project and ending with the project's completion under controlled conditions that minimize environmental impact. A NEPA review includes the recognition of the environmental aspects of the project that, if not managed, could result in detrimental environmental impact when the project is completed. The end point of the project, such as the construction, installation, and use of a piece of equipment, is also examined for environmental aspects so that impact is controlled at implementation and going forward.

For the first time in 2005, there are two interrelated EMS's at the SPR. DOE self certified their EMS in 2005 while DM retains certification of its EMS with an outside registering body. Both DOE and DM pattern their EMS in accordance with the ISO 14001 EMS standard. There is a top-down commitment to full implementation of this EMS. Both EMSs establish the necessary organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, and maintaining the DOE and DM environmental policies. They differ in their scope of implementation. The DOE EMS is at a high level involving oversight of the SPR, and relies on the DM EMS for managing aspects relating to the routine hands-on management and operation of the SPR.

3.8 TRAINING

Site personnel with environmental responsibilities and Emergency Response Team (ERT) personnel have received training in environmental plans and procedures. Site management personnel are knowledgeable of environmental procedures; spill reporting procedures, site-specific Spill Prevention Control and Countermeasures (SPCC) Plans, Emergency Response Procedures, and compliance awareness. ERT personnel from all sites participate in annual spill response refresher and hazardous materials technician training currently provided at Louisiana State University. Onsite drills and exercises are also conducted to hone spill management strategies, practice spill cleanup methodologies, and sharpen control skills. Site response personnel are trained to rapidly and effectively contain and cleanup oil, brine, and hazardous substance spills under circumstances typical at each SPR site. New Orleans personnel, who are expected to provide site support during an incident response, have also been trained to the hazardous materials technician level. All site personnel and unescorted site visitors receive compliance awareness training via "The Active Force of Protection" video which provides an overview of the environmental program including individual responsibilities under the program. Spill Prevention and Waste Management/Hazardous Waste Handling training is mandatory and conducted annually for those personnel who could discover, prevent, or respond to spills, and handle or supervise the handling of wastes.

All site personnel also receive computer-based ISO 14001 EMS training annually. The training provides an overview of those elements of the ISO 14001 standard that involve all personnel. It also identifies environmental aspects and impacts of SPR activities and environmental objectives to be achieved that year.

As a goal, all M&O contractor environmental staff members are trained to the National Registry of Environmental Professionals, Registered Environmental Manager (REM), level and are independently certified as such through examination.

In order to better assist the SPR sites with regard to performing SPR site assessments, and Treatment Storage Disposal (TSD) facility due diligence inspections, several M&O environmental staff members have completed ISO 14001 Lead Auditor certification training.

DOE environmental staff provides oversight of M&O and construction contractor activities and have completed ISO 14001 Lead Auditor Certification, and NEPA and environmental compliance training. DOE staff certifications include RAB EMS Lead Auditor registration, REM designation, and certified EH&S manager.

3.9 WEBSITE

In order to provide an efficient and effective means of obtaining information about key environmental topics at the SPR, An ES&H website was developed. This website is only available on the SPR internal intranet and contains a summary of all the major environmental regulatory and program information, including active permits, procedures and this report, and is updated monthly.

In addition, a brief description of the DM ES&H program is available to the public at www.DynMcDermott.com. This report and other DOE ES&H information is available to the public at www.spr.doe.gov/esh/.

4. ENVIRONMENTAL RADIOLOGICAL PROGRAM INFORMATION

Radioactive sources at the SPR consist of X-ray that is used in laboratory and scanning equipment or other sealed sources brought on site for the purpose of performing radiography and cavern wire-line type logging operations. Procedures are in place to protect personnel from exposure during these operations. In addition the SPR is subject to inspections by the state implementing agencies (Louisiana Department of Environmental Quality and Texas Department of Health) and required notices to employees are posted on each X-ray scanning device.

4.1 SEALED SOURCES

At the SPR sealed sources of radiation are used for monitoring activities related to the physical properties of crude oil, brine, and cavern dimensions. During 2005 sealed sources were used at the SPR to perform cavern integrity monitoring activities without the occurrence of any incidents.

4.2 NATURALLY OCCURRING RADIOACTIVE MATERIALS (NORM)

A contracted survey, conducted at all SPR sites and the commercial pipe yard where SPR piping is stored, was completed in 1991. The results, no readings of elevated levels at any location, were submitted to the states as required by Louisiana and Texas regulations. No additional monitoring is required due to the negative results of this 1991 NORM survey.

5. ENVIRONMENTAL NON-RADIOLOGICAL PROGRAM INFORMATION

A primary goal of DOE and the SPR contractor is to ensure that all SPR activities are conducted in accordance with sound environmental practices and that the environmental integrity of the SPR sites and their respective surroundings is maintained.

Effluent and surveillance monitoring are conducted at the SPR storage sites to assess the impact of SPR activity on air, surface water, and ground water. Effluent monitoring consists of measuring the pollutants of concern in airborne and liquid effluents while surveillance monitoring consists of sampling the environmental media at or around the sites.

5.1 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

Two EMSs are now employed at the SPR for environmental management, one at the DOE Project management office (PMO) level and one at the M&O contractor level. DOE self-certified their EMS to the ISO 14001:2004 Standard in 2005. The M&O contractor’s (DM) EMS was initially certified to the ISO 14001:1996 standard by an RAB (now ANAB) accredited registrar in 2000 and re-certified in 2003. Certification to the standard continued in 2005. Both EMSs include the necessary organizational structure, activity planning, designation of responsibilities, practices, procedures, processes, and resources to support and validate the DM and DOE Environmental Policies, ASP5400.2 and SPRPMO P 451.1, respectively (Appendix B).

Conformance of the EMS to the ISO 14001 standard is illustrated through the DOE order “SPRPMO Environmental Management System (DOE SPRPMO O 450.1) and the DM procedure “ISO 14001 Environmental Management System Manual (ASI5400.55). These documents provide descriptions or references to SPR policies, plans, procedures, environmental aspects and impacts, and objectives and targets that are the foundation of the EMS's. Some DOE EMS requirements flow down to the M&O contractor and include portions of the M&O contractor's EMS. Table 5-1 delineates where the elements of both EMS's are integrated and where they parallel.

Environmental management programs conducted to achieve environmental objectives are briefly described in Table 5-2 EMS Program Achievement.

Table 5-1 DOE and M&O Contractor EMS Comparison Matrix

ISO 14001 Element	How Integrated	How Independent
Environmental Policy	DOE policy communicated to M&O Contractor. M&O Contractor policy supports DOE policy.	Reviewed, updated, published, and maintained independently.
Environmental Aspects	DOE adopts aspects identified by M&O Contractor	None
Legal and Other Requirements	Both use the same ES&H Standards list maintained by the M&O contractor and reviewed by DOE.	Requirements levied specifically on SPRPMO personnel and M&O contractor personnel.
Objectives, Targets and Programs	DOE objectives (goals) flow down to M&O contractor.	M&O contractor may set additional objectives.
Resources, Roles, Responsibility, and Authority	DOE provides oversight to M&O contractor activities.	Both have different responsible personnel and EMS Management Representatives
Competence, Training, and Awareness	DOE and M&O contractor EMS awareness training courses almost identical	DOE and M&O contractor training requirements are identified independently.

Table 5-1 DOE and M&O Contractor EMS Comparison Matrix (continued)

ISO 14001 Element	How Integrated	How Independent
Communication	Have similar means and controls on internal and external communication. Strong DOE/M&O contractor communication.	Differing responsibilities result in different realms of communication.
Documentation	Some documents are common to both EMS's such as DOE PMO directives that flow down to the M&O contractor.	Some DOE orders and Manuals only apply to the DOE EMS.
Control of Documents	None	Both EMS's employ different document control programs.
Operational Control	DOE has operational controls that flow down to the M&O contractor	DOE and the M&O contractor have procedures that pertain specifically to DOE or M&O contractor personnel.
Emergency Preparedness and Response	DOE requirements flow down to and are implemented by the M&O contractor.	None
Monitoring and Measurement	DOE requirements flow down to and are documented and implemented by the M&O contractor.	DOE audits the M&O contractor. The M&O contractor does not audit DOE.
Evaluation of Compliance	DOE and the M&O contractor conduct compliance audits on requirements applicable to both EMS's. Both groups work together on NEPA compliance evaluations.	DOE audits the M&O contractor. The M&O contractor does not audit DOE. DOE also audits other DOE subcontractors not linked to the M&O contractor. DOE and M&O contractor audits are independent of each other.
Non-conformity, Corrective Action and Preventive Action	DOE requirements flow down to the M&O contractor. Both groups track corrective and preventive actions with the same database.	The M&O contractor manages corrective and preventive action in accordance with an M&O instruction.

Table 5-1 DOE and M&O Contractor EMS Comparison Matrix (continued)

ISO 14001 Element	How Integrated	How Independent
Control of Records	DOE is dependent on the M&O contractor to manage and maintain all official government environmental records, and both groups use the same federal records disposition requirements.	None
Internal Audit	DOE audits the same compliance and EMS issues as the M&O contractor.	Both audit programs are independent. The M&O contractor does not audit DOE's compliance and EMS issues.
Management Review	Reviews of both groups include similar information, such as audit results, status of corrective and preventive actions, and achieving objectives and targets.	Management reviews are prepared and conducted independently.

Table 5-2 EMS Program Achievement

Environmental Objective	How Achieved
Reduce hazardous waste generation	A P2/E2 Leadership goal. Refer to Item 1, Table 2-1.
Reduce sanitary waste generation	A P2/E2 Leadership goal. Refer to Item 3, Table 2-1.
Increase recycling of sanitary waste through waste diversion	A P2/E2 Leadership goal. Refer to Item 4, Table 2-1.
Meet environmental actions and submit documents to DOE and regulators on/before milestone dates	Milestone dates are agreed upon with environmental personnel prior to discussion with DOE and their subsequent establishment. They are tracked by environmental personnel and DOE via DM's weekly environmental Summary of Significant Environmental Impacts and Activities.
Review purchase requests, designs, summaries of work, and other documents by due dates	Each department has a focal point for receiving documents for review. The documents are distributed by the focal point to subject matter experts for review and comment.

Table 5-2 EMS Program Achievement (continued)

Environmental Objective	How Achieved
Reduce environmental permit exceedances	Personnel involved with activities that involve environmental permits are aware of permit limitations that can be affected by their activities. When they do occur, exceedances are formally addressed real time in an Occurrence Report. The reports prompt a description of occurrence, cause, and corrective action. To provide awareness and promote corrective action, the information is also provided monthly in a report to the DM President and to upper management at the monthly project review meeting for discussion.
Reduce violations to the Clean Air, Clean Water, and Resource Recovery and Conservation Acts	Awareness is provided to site personnel through spill prevention and waste management training. Reportable releases are documented and managed like permit exceedances. Waste accumulation areas are inspected weekly and waste inventories are conducted monthly. Waste reports are reviewed monthly for compliance issues by ES&H Managers and the New Orleans waste management specialist.
Reduce the number of reportable occurrences of releases	During a release, trained emergency response personnel respond to control and minimize spill impact. Releases are documented and reviewed in the same manner as permit exceedances and violations to the Clean Air and Clean Water Acts.
Maintain EMS certification to the ISO 14001 Standard	Money and time are budgeted to accommodate third party audits by an ANAB accredited registrar. Audit dates are scheduled with the registrar and participating sites months in advance to assure that a minimum of two audits are completed by the end of June and December.
Increase purchasing of EPA designated recycled content products (affirmative procurement)	A P2/E2 Leadership goal. Refer to Item 6, Table 2-1.

Table 5-2 EMS Program Achievement (continued)

Environmental Objective	How Achieved
Maintain a high Maintenance Performance Appraisal Report (MPAR) score for the maintenance program	A well-maintained facility should equate to fewer environmental impacts. MPAR is a weighted average that is, on a monthly basis, calculated, published in a detailed report, and reported to DOE. It is used to measure performance related to quality of maintenance, preventive maintenance completion, maintenance support, scheduling effectiveness, productivity, corrective maintenance backlog, and readiness of critical must-operate equipment. Maintenance related criteria that are measured include quality, support to other areas, mission readiness, scheduling effectiveness, productivity, preventive maintenance completion, and backlog. Each criterion has a goal, and failure to achieve a goal serves as an indicator for attention.
Conduct an effective predictive maintenance program (PdM).	Data is systematically collected and analyzed on equipment essential for drawdown and fill operations to prevent failure and possible resultant environmental impact. Equipment performance is monitored during actual use and during exercises. Vibration monitoring is a critical part of PdM. Other types of predictive maintenance testing include monitoring of pump flow and head performance, utilizing thermography to inspect electrical distribution systems, testing oil in rotating equipment to determine machine and lubricant condition, analyzing motor data, and utilizing airborne ultrasonic technology to detect electrical abnormalities.
Complete planned community outreach projects.	A Public Outreach Plan is developed by DOE and implemented each year by the DM Director of Community Development. The plan addresses four areas of focus – community outreach, primary customer outreach, environmental safety and health outreach, and new initiatives. The plan lists the year’s activities and provides a description for each. Employee awareness and participation in community outreach is promoted.

Table 5-2 EMS Program Achievement (continued)

Environmental Objective	How Achieved
Maintain site physical protection (security) systems.	A physically secure site should be less vulnerable to environmental impact by subversive elements. Security systems are constantly monitored for performance by the site's protective force. Discrepancies are reported daily to the site security specialist for review and initiation of a work order for repair. Work orders for the PPS systems are given very high priority – the same as drawdown critical equipment. Also, the site security specialist champions the work orders during the work scheduling meetings.
Complete and submit semi-annual piping and pipeline assurance reports on schedule.	Piping and pipeline assurance reports culminate pipe integrity inspection and testing activities. These activities support spill prevention. Periodic activities that support pipeline integrity include: ultrasonic testing, cathodic protection, employing corrosion coupons, smart pig inspections and pipeline over flights.
Ensure key spill equipment is available.	Each site has key spill equipment that is tailored to site conditions. The equipment is inventoried quarterly by the site's emergency management coordinator. Any operational discrepancies are noted and corrective action is taken.
Ensure basic order agreements are in place for spill response and clean up at each site.	Each site has agreements with at least two spill response contractors - a primary and an alternate. When choosing contractors, factors such as company location, available/type of equipment, and available manpower are considered. The contractors are called out to participate in annual drills where their performance is evaluated.

Table 5-2 EMS Program Achievement (continued)

Environmental Objective	How Achieved
Ensure emergency response capabilities through training emergency response team (ERT) members.	Each site has a group of well-trained ERT personnel who can respond to emergencies such as spills and fires. Training is budgeted annually. New ERT members receive 40 hours of fire training independent of the SPR. The New Orleans Emergency Preparedness group and the site emergency coordinators develop refresher training annually. Refresher training has been conducted at Texas A&M and Louisiana State Universities. Unannounced and scheduled site drills are also conducted at each site to test skills and strategies.
Ensure that the Incident Commander/Qualified Individual at each site is trained in Incident Command.	Due to the potential size and complexity of SPR emergencies, and the probability that emergency response will include outside agencies and other entities, key management at all sites (including New Orleans) who could serve as the incident commander or qualified individual have received computer based training in Incident Command. Incident management is tested during every drill.
Successfully complete Preparedness for Response Exercise Program (PREP) drills/exercises.	Formally implemented emergency fire, spill, and security exercises test communications, organizational abilities, strategies, and physical competence of personnel and equipment. Response by DM personnel and emergency response contractors is observed and evaluated by a team composed of DM and DOE personnel and outside interested parties (i.e. state/federal regulators and environmental advisory team members). Exercises allow responders to apply their abilities and knowledge, test their equipment, and learn ways to improve their response.
Ensure fire protection capabilities at each site through prompt Priority One and Two fire protection system repairs.	Work orders to repair fire protection equipment are tracked weekly to assure that they receive sufficient attention for prompt resolution. The site fire protection specialist reviews open work orders during regularly scheduled work planning meetings and champions work orders for fire system repair. The level of response to repair fire equipment is gauged against the level of response provided to must-operate equipment. Fire system repairs are to be completed as promptly or sooner than the time for vital operational equipment repairs.

Table 5-2 EMS Program Achievement (continued)

Environmental Objective	How Achieved
Minimize utility costs by controlling overall electric loads and reduce energy consumption through efficiency improvements.	A P2/E2 Leadership goal. Refer to Item 7, Table 2-1.
Demonstrate progress toward installing cost effective energy conservation measures identified by the Site Building Comprehensive Facility Audits and the E2P2 committee.	A P2/E2 Leadership goal. Refer to Item 7, Table 2-1.
Purchase low standby power devices from five of the ten devices identified at the website http://oahu.lbl.gov/ and purchase Energy Star devices as required by the Energy Policy Act of 2005	Effort has been made to purchase low standby power devices identified by the Federal Energy Management Program. Computer monitors with a one watt standby power consuming feature will be purchased to support new PC technology being introduced at all sites. All devices purchased meet “Energy Star” requirements, and Energy Star devices have been flagged in the electronic material database.
Reduce lead acquisition via lead/acid batteries in the electric vehicle fleet.	As they failed battery packs composed of wet lead/acid (conventional) batteries in electric vehicles were replaced with newer technology absorbed glass mat batteries that are designed to last longer. In 2005, battery use and further product investigation showed that the new technology batteries do not last any longer and actually contained more lead than the original wet cells. As they failed, the new technology batteries were replaced with original equipment batteries. Effort is being made to promote battery life through careful maintenance and charging.
Reduce VOC emissions from cavern workover operations.	Effort is being made to find ways to prevent or reduce workover related VOC emissions through operational and equipment changes. So far the most promising possibilities for improvement include using a closed tank instead of a frac tank and site surge tanks instead of frac tanks.
Through the degasification process, reduce potential VOC emissions from crude oil that would be sent off-site into Commerce during a drawdown.	This objective was completed in 2005 at Big Hill. Crude oil in selected caverns was processed through a degasification plant on site. The oil vapor pressure was lowered, thereby lowering its emissions at its destination (i.e. terminal or refinery).

Table 5-2 EMS Program Achievement (continued)

Environmental Objective	How Achieved
Provide habitat on site to protect wildlife.	On-site areas are designated and protected when and where possible as refuge for wildlife. Grassy acreage at Bryan Mound is left undisturbed from late summer through early spring for use by resident and migratory birds for food and shelter. These set-aside areas are mowed only during the growing season. At all sites, active bird nesting locations are noted and marked as needed to warn personnel not to disturb them. In the fall, a grassy area at Bayou Choctaw is seeded to provide winter food for deer and other grazing and browsing wildlife.
Increase use of the Qualified Products List (QPL).	Chemical products screened for environmental issues prior to purchase reduce the risk of hazardous waste generation later when used, promote efficient product use, and decrease unnecessary user exposure. Product requestors select chemical products previously approved on the QPL or obtain the approval of an unlisted product from the Environmental Department before purchasing. Awareness of the need of the program and how to use the QPL will be increased to bolster success of this program.

5.2 PROTECTION OF BIOTA

As addressed in previous sections of this report, the SPR does not maintain radioactive processes and thus there is not a requirement to monitor radioactive doses in the surrounding biota. The SPR does, however, take steps in accordance with the DM Environmental Policy (Appendix B) and standards established by DOE, to ensure that the surrounding wildlife population is not impacted.

In addition, select SPR site personnel have received training on wildlife rescue and rehabilitation techniques including oiled wildlife response. This training allows personnel to work under the supervision of a licensed rehabilitator. An oil spill at the SPR sites could affect large numbers of protected migratory birds and wildlife requiring many trained and certified responders. Trained personnel have special knowledge and skills in the wildlife rescue and rehabilitation techniques necessary in support of the emergency incident command structure organization.

5.3 AIR QUALITY EFFLUENT MONITORING

The air pollutants of concern that are emitted by the SPR sites are either hazardous or have an impact on the ambient air quality. The hazardous air pollutants (HAP) are benzene, toluene, ethyl benzene, and xylene. However these are emitted in relatively small quantities that do not trigger HAP reporting. The non-hazardous pollutants that have an impact on air quality are non-methane/non-ethane volatile organic compounds (VOC), nitrogen oxides (NOx), sulfur dioxides (SO_2), carbon monoxide (CO), and particulate matter (PM_{10}). The quantity of these pollutants emitted is minor relative to other facilities in the respective air quality regions.

Effluent monitoring for air pollutants consists of monitoring processes and calculating the effluent volume through the use of acceptable industry practices. These results are compared to the permitted limits to ensure that they are in compliance.

Effluent monitoring at the SPR consists of measuring the following in order to quantify emissions:

- run-time of diesel powered emergency electrical generators;
- volume and type of crude oil flowed through frac tanks, floating roof tanks, diesel tanks, gasoline tanks, and oil-water separators;
- volume of paint and solvent used on-site;
- volume of brine which may release VOCs placed into the brine pond;
- number of piping components that emit over the acceptable regulatory limits (leakers) by monitoring all components with an organic vapor analyzer (OVA).

Effluent monitoring for air pollutants is conducted at both Texas (Big Hill and Bryan Mound) and two Louisiana sites (Bayou Choctaw and West

Hackberry). The results are reported to state agencies through EIQs, except for Bayou Choctaw and West Hackberry. These sites are exempt from reporting because their emissions are below the regulatory threshold for reporting in their respective air quality regions. Even though the results of monitoring for Bayou Choctaw and West Hackberry are not reported, they are used to determine ongoing compliance with the permit and assure adequate performance of emission control equipment.

Another type of monitoring conducted at the SPR sites is air pollution control equipment monitoring. The air regulations require that the seals on internal and external floating roof tanks be inspected at frequent intervals for visible tears, holes, or cumulative gaps exceeding regulatory limits and to ensure they are operating accordingly. Big Hill has an external floating roof tank that requires inspection of the primary (every five years) and secondary (semi-annual) seals. The three internal floating roof tanks at Bryan Mound have a mechanical shoe seal that requires seal inspections every year.

5.3.1 Bayou Choctaw

Located in a marginal non-attainment area for ozone, Bayou Choctaw is permitted to emit 7.4 metric tpy (8.14 tpy) of VOC. Since this site emits less than nine metric tpy (10 tpy), it is not required to submit an emissions inventory summary (EIS) to report its annual emissions.

Although Bayou Choctaw is exempt from reporting emissions, effluent monitoring was conducted in 2005 on all permitted sources. These sources include the volume of crude oil in slop tanks and frac tanks, volume of brine flowing through the brine pond, fugitive emissions from monitoring piping components for acceptability, and monitoring the run-time of the emergency generators.

Bayou Choctaw operated in accordance with all air quality regulatory requirements in 2005. Table 5-3 is a summary of the permitted limits for Bayou Choctaw. Due to air regulatory reporting requirements in the state of Louisiana it is not required to report the parameter permitted limits and therefore they are not listed in Table 5-3.

Table 5-3. Parameters for the Bayou Choctaw Emission Points

Emission Point Description	Parameter	Permit Limits Metric tpy (tpy)
Crude & Slop Oil Tanks	VOC	2.43(2.67)
Gasoline Fuel Tank	VOC	0.52 (0.57)
Frac Tanks	VOC	1.42 (1.56)
Brine Pond	VOC	1.14 (1.26)
Fugitive Emissions	VOC	1.66 (1.83)
Air Eliminator	VOC	0.04 (0.04)
Emergency Generators/Pumps	VOC PM_{10} SO_2 NO_x CO	0.19 (0.21) 0.18 (0.20) 0.72 (0.79) 5.54 (6.09) 1.26 (1.39)

5.3.2 Big Hill

Located in a marginal non-attainment area for ozone, Big Hill is permitted to emit 16.6 metric tpy (18.35 tpy) of VOC. Since it emits more than nine metric tpy (10 tpy), it is required to use an emissions inventory questionnaire (EIQ) to report its annual emissions. Effluent monitoring was conducted in 2005 on all permitted sources such as the volume of crude oil in slop tanks, frac tanks, and surge tank; volume of brine into the brine pond; monitoring piping components to determine fugitive emission acceptability monitoring the run-time of the emergency generators. Big Hill operated in accordance with all air quality regulatory requirements in 2005. Table 5-4 is a summary of the permitted limits and actual emissions for Big Hill.

Table 5-4. Parameters for the Big Hill Emission Points

Emission Point Description	Parameter	Permit Limits, Metric tpy (tpy)	Actual Emissions Metric tpy (tpy)
Crude & Slop Oil Tanks	VOC	0.59 (0.65)	2.82 (3.10)
Gasoline & Diesel Fuel Tanks	VOC	0.25 (0.28)	0.32 (.35)
Brine Pond	VOC	2.86 (3.15)	5.49 (6.04)
Fugitive Emissions	VOC	8.47 (9.34)	0.07 (0.08)
Air Eliminator	VOC	1.36 (1.50)	0 (0)
Solvent Recycler	VOC	0.05 (0.06)	0 (0)
	Acetone	0.01 (0.01)	0 (0)
Emergency Generators/Pumps	VOC	0.11 (0.12)	0.05 (0.06)
	PM_{10}	0.07 (0.08)	0.05 (0.06)
	SO_2	0.64 (0.71)	0.39 (0.43)
	NO_x	2.38 (2.62)	1.35 (1.48)
	CO	0.52 (0.57)	0.31 (0.34)
Degas Plant	VOC	2.95 (3.25)	1.21 (1.33)
	NO_x	14.14 (15.59)	1.58 (1.74)
	CO	18.11 (19.96)	1.98 (2.18)
	SO_2	0.44 (0.48)	0 (0)
	PM_{10}	1.24 (1.37)	0.14 (0.15)

5.3.3 Bryan Mound

Located in a moderate non-attainment area for ozone, is permitted to emit 19.7 metric tpy (21.8 tpy) of VOC. Since the site emits more than nine metric tpy (10 tpy), it is required to use an EIQ to report its annual emissions. Effluent monitoring was conducted in 2005 on all permitted sources. These sources include the volume of crude oil in slop tanks, frac tanks, and three internal floating roof tanks; volume of brine into the brine tank; monitoring piping components to determine fugitive emission acceptability; and monitoring the run-time of the emergency generators. Bryan Mound operated in accordance with all air quality regulatory requirements in 2005. Table 5-5 is a summary of the permitted limits and actual emissions for Bryan Mound.

Table 5-5. Parameters for the Bryan Mound Emission Points

Emission Point Description	Parameter	Permit Limits, Metric tpy (tpy)	Actual Emissions Metric tpy (tpy)
Crude Oil Tanks	VOC	9.35 (10.31)	2.92 (3.21)
Gasoline & Diesel Fuel Tanks	VOC	0.38 (0.42)	0.34 (0.37)
Brine Tank	VOC	4.92 (5.42)	0.80 (0.88)
Fugitive Emissions	VOC	0.89 (0.98)	0.14 (0.15)
Paints & Solvents	VOC	0.62 (0.68)	0.12 (0.13)
Emergency Generators/Pumps	VOC PM_{10} SO_2 NO_x CO	0.06 (0.07) 0.06 (0.07) 0.50 (0.55) 1.62 (1.79) 0.37 (0.41)	0.03 (0.03) 0.03 (0.03) 0.04 (0.05) 0.33 (0.36) 0.08 (0.09)
Degas Plant	VOC NO_x CO SO_2 PM_{10}	3.48 (3.84) 13.67 (15.07) 17.23 (18.99) 0.34 (0.37) 1.24 (1.37)	N/A N/A N/A N/A N/A

5.3.4 West Hackberry

Located in an ozone attainment area, West Hackberry is permitted to emit 37 metric tpy (40.8 tpy) of VOC. Since the site emits less than 45.4 metric tpy (50 tpy), it is not required to submit an EIS to report its annual emissions.

Although West Hackberry is exempt from reporting emissions, effluent monitoring was conducted in 2005 on all permitted sources. These sources include the volume of crude oil in slop tanks and frac tanks, volume of brine into the brine tank, monitoring piping components to determine fugitive emission acceptability, and monitoring the run-time of the emergency generators. West Hackberry operated in accordance with all air quality regulatory requirements in 2005. Table 5-6 is a summary of the permitted limits for West Hackberry. Due to air regulatory reporting requirements in the state of Louisiana it is not required to report the parameter permitted limits and therefore they are not listed in Table 5-6.

Table 5-6. Parameters for the West Hackberry Emission Points

Emission Point Description	Parameter	Permit Limits, Metric tpy (tpy)
Slop Oil Tanks	VOC	1.81 (1.99)
Gasoline Fuel Tank	VOC	0.25 (0.28)
Frac Tanks	VOC	23.86 (26.30)
Brine Tank	VOC	0.95 (1.05)
Fugitive Emissions	VOC	9.71 (10.70)
Air Eliminator	VOC	0.06 (0.07)
Emergency Generators/Pumps	VOC PM_{10} SO_2 NO_x CO	0.41 (0.45) 0.20 (0.22) 0.02 (0.02) 12.59 (13.88) 2.75 (3.03)

5.4 WATER DISCHARGE EFFLUENT MONITORING

The water discharge permit-monitoring program fulfills the requirements of the EPA NPDES, and corresponding states RCT Rule 8 and LPDES programs. All SPR point source discharges are conducted in compliance with these federal and state programs.

SPR personnel regularly conducted point source discharges from all sites during 2005. These discharges are grouped as:

a. brine discharge to the Gulf of Mexico;

b. storm water runoff from tank, well, and pump pads;

c. rinse water from vehicles at specific locations draining to permitted outfalls;

d. effluent from package sewage treatment plants; and

e. hydrostatic test water from piping or tanks (LA only).

The SPR disposed of 4.93 million m^3 (31.03 mmb) of brine (mostly saturated sodium chloride solution with some infrequent discharges of lower salinities than normally attributed to brine) during 2005.

Approximately 53.1 percent of the brine was disposed in the Gulf of Mexico via the Big Hill (46.4 percent of the total) and the Bryan Mound (6.7 percent of the total) brine disposal pipelines. The remainder was disposed in saline aquifers via injection wells at the Bayou Choctaw (10.5 percent of the total) and West Hackberry (36.4 percent of the total) sites.

During 2005, 2,041 measurements and analyses were performed to monitor wastewater discharge quality from the SPR in accordance with NPDES and corresponding state permits. The SPR was in compliance with permit requirements for approximately 99.95 percent of the analyses performed in 2005. Only one permit non-compliance was reported in 2005. The single non-compliance was of short duration and immediately resolved, causing no observable adverse environmental impact. Detailed information for this non-compliance is provided in section 5.4.1 of this report.

Parameters monitored varied by site and discharge. Separate tables provide specific parameters and the most frequent sampling interval (based on permit limitations). More frequent measurements are often made of certain parameters that assist with unit operations; these additional data are reported as required by the permits. The data measurement variations observed during CY 2005 is discussed in separate sections by site.

5.4.1 Bayou Choctaw

Bayou Choctaw personnel performed a total of 53 measurements on permitted outfalls and reporting stations to monitor LPDES permit compliance during 2005. Table 5-7 provides the permit required monitoring parameters and limits for the Bayou Choctaw outfalls. There was one non-compliance in 2005, a high BOD in the waste water effluent, resulting in a 98.1 percent site compliance performance record for the year. Additional details for this non-compliance are outlined in Table 5-8.

Most monitoring is related to water discharges regulated under the Louisiana Department of Environmental Quality (LDEQ) Office of Water Resources LPDES permit. Discharges are from two package sewage treatment plants (STP), and stormwater runoff from well pads, pump pads (containment areas), and the site vehicle rinsing station.

Table 5-7. Parameters for the Bayou Choctaw Outfalls

Location/Discharge	Parameter	Frequency*	Compliance Range
Sewage Treatment Plants	Flow BOD_5 TSS pH Fecal Coliform	1/6 months 1/6 months 1/6 months 1/6 months 1/6 months	(Report only) <45 mg/l Avg. <45 mg/l max 6.0 – 9.0 s.u. <400 col./100 ml
Raw Water System Test Water, Raw Water System Maintenance Diversion Water, Fire System Test Water, Facility Wash Water	pH TOC Oil & Grease	Annually if discharged	6.0 to 9.0 s.u. <50 mg/l <15 mg/l
Piping (50:50 Clorox/ Wash Water)	pH TOC	Annually if discharged	6.0 to 9.0 s.u. < 50 mg/l

Table 5-7. Parameters for the Bayou Choctaw Outfalls (continued)

Location/Discharge	Parameter	Frequency*	Compliance Range
Storm Water	Flow Oil and Grease pH TOC Visible Sheen	1/quarter 1/quarter 1/quarter 1/quarter 1/discharge	(report only) <15 mg/l max 6.0 – 9.0 s.u. <50 mg/l no presence
Vehicle Rinsing	TOC Oil and grease pH	Annually if discharged	<50 mg/l <15 mg/l 6.0-9.0 s.u.

*Permit requires an increase in the sampling frequency when an exceedance occurs.

Table 5-8 2005 Permit Noncompliance at Bayou Choctaw

Date	Outfall Location	Permit Parameter	Value (Limit)	Cause
1/12/05	001 – Sewage Treatment Plant	BOD5	51 mg/l (45 mg/l)	Routine semi-annual samples for the outfall obtained on Jan 12/2005 (for Jan - Jun 2005) monitoring period. Data received for the BOD5 parameter on 2/17/2005 indicated the BOD5 level was at a concentration of 51 mg/l which exceeds the permitted weekly average limit of 45 mg/l. Other effluent limitations were within acceptable ranges and no obvious indications were noted. Flow was normal (est. 830 GPD at time of sampling). Additional samples were collected on a monthly basis demonstrated the STP immediately returned to compliance with the permit requirements.

5.4.2 Big Hill

During 2005, 1,126 measurements were performed to monitor NPDES and state discharge permit compliance. Table 5-9 provides the permit required monitoring parameters and limits for the Big Hill outfalls. There were no non-compliances during 2005 resulting in a 100 percent site compliance performance level.

Water discharges at Big Hill are regulated and enforced through the EPA NPDES permit program and the similar RCT discharge permit program (Rule 8). The discharges at the site involve brine to the Gulf of Mexico, hydroclone blow down into the Intracoastal Waterway, effluent from the sewage treatment plant, and storm water from well pads and pump pads. There were no discharges during 2005 from the hydroclone blow down system. A minor permit modification increasing the minimum exit velocity by 30 fps in 2004 was processed and made effective for the EPA NPDES and RCT permits. A performance-based permit condition allowing a minor reduction in WET testing frequency was also enacted in 2005.

Table 5-9. Parameters for the Big Hill Outfalls

Location/Discharge	Parameter	Frequency*	Compliance Range
Brine to Gulf	Flow	Continuously	0.27 million m3/day
	Velocity	Per flow	>9.1 m/sec (30 ft/sec)
	Oil & Grease	1/mo	<15 mg/l max, <10 mg/l avg.
	TDS	1/mo	(report only)
	TSS	1/mo	(report only)
	pH	1/mo	6.0 - 9.0 s.u.
	DO	Daily	detectable (when using O_2 scavenger)
	Biomonitoring	1/qtr	Lethal NOEC 2.5%
	Integrity Tests	1/yr	Offshore within 4% of onshore
Storm Water Outfalls	Oil and Grease	1/mo	<15 mg/l
	TOC	1/mo	< 75 mg/l
	pH	1/mo	6.0 - 9.0 s.u.
	Salinity	1/mo	<8 ppt

Table 5-9. Parameters for the Big Hill Outfalls (continued)

Location/Discharge	Parameter	Frequency*	Compliance Range
Recirculated Raw Water	Flow	1/mo	Report only
Sewage Treatment Plant	Flow BOD_5 TSS pH	5 days/wk 1/mo 1/mo 1/mo	(report only) <45 mg/l max <20 mg/l avg. <45 mg/l max <20 mg/l avg. 6.0 - 9.0 s.u.
Hydro clone Blow down (not used)	Flow TSS pH	1/wk 1/wk 1/wk	report report 6.0 - 9.0 s.u.

*Permit requires an increase in the sampling frequency when an exceedance occurs.

5.4.3 Bryan Mound

Bryan Mound personnel made 804 measurements on permitted outfalls for the purpose of monitoring NPDES and state discharge permit compliance during 2005. Table 5-10 provides the permit-required parameters and limits for the Bryan Mound outfalls. There were no non-compliances during 2005 resulting in a 100 percent site compliance performance level.

Water discharges at Bryan Mound are regulated and enforced through the EPA NPDES permit program and the similar RCT discharge permit program for state waters (Rule 8). Minor modifications to these permits increasing the minimum exit velocity from the brine diffusers to 30 fps to improve dispersion attributes became effective in 2005. Table 5.10 identifies those changes occurring with both the state and federal permits during this modification activity.

Table 5-10. Parameters for the Bryan Mound Outfalls

Location/Discharge	Parameter	Frequency*	Compliance Range
Brine to Gulf	Flow	Continuously	report only
	Velocity	Per flow	>9.1 m/sec (30 ft/sec)
	Oil & Grease	1/wk(RCT)	<15 mg/l max <10 mg/l avg.
	TDS	1/mo	(report only)
	TSS	1/mo	(report only)
	pH	1/mo	6.0 - 9.0 s.u.
	Biomonitoring	1/qtr	Lethal NOEC 2.5%
	Integrity test	1/yr	Offshore within 4% of onshore
Storm Water	Oil and Grease	1/qtr	<15 mg/l
	TOC	1/qtr	<75 mg/l
	pH	1/qtr	6.0 - 9.0 s.u.
	Salinity	1/qtr	< 8 ppt
Recirculated Raw Water	Flow	1/mo	Report only
Sewage Treatment Plant	Flow	1/mo	Report only
	BOD_5	2/mo	<20 mg/l avg. <45 mg/l max
	TSS	2/mo	<20 mg/l avg. <45 mg/l max
	pH	2/mo	6.0 - 9.0 s.u.

*Permit requires an increase in the sampling frequency when an exceedance occurs.

5.4.4 West Hackberry

West Hackberry personnel performed 58 measurements on permitted outfalls to monitor LPDES permit compliance during 2005. Table 5-11 provides the permit-required parameters and limits for the West Hackberry outfalls. There were no permit non-compliances during 2005 resulting in a 100 percent site compliance level.

The water discharges at the West Hackberry site were regulated under the EPA (NPDES) permit administered by the state of Louisiana under the LPDES permit program. Since removed from service in 1999 the site has had no permit controlled testing or reporting requirements for the former offshore brine line. The current permit covers treated sanitary sewage, car rinsing, and an intermittent mixed discharge of raw water, storm water and once-through non-contact bearing cooling water with separate effluent limitations and incorporates coverage for all of the former named stormwater outfalls under the state's Multi-Sector General Permit (MSGP). Certain named non-storm water discharges are addressed via the required site Storm Water Pollution Prevention Plan (SWPPP). That permit coverage remained in full-force during CY2005 as detailed in Table 5-11.

Table 5-11. Parameters for the West Hackberry Outfalls

Location/Discharge	**Parameter**	**Frequency***	**Compliance Range**
Raw Water Test Discharges (incl. Non-contact Once-through Cooling Water and Diversion Water)	TOC Oil & Grease pH Visible sheen	None None None None	≤50 mg/l ≤15 mg/l 6.0 to 9.0 s.u. no presence
Storm Water (Wellpads & Containments at Slop Oil Tank battery, slop oil tank booster pump pad, vehicle rinse station, brine storage tank area, High Pressure Pump Pad, Fuel Storage Area, Emergency Generator, Lake Charles Meter Station, and RWIS Transformer Area)	Visual Observations made in accordance with Sector P (SIC Code 5171) of the current MSGP	1/quarter	perform and record standardized observations and maintain onsite in accordance with the SWPPP and/or site instruction
External Vehicle Rinsing/Washing	Flow (Daily Max) COD TSS O&G + visual pH	1/quarter 1/quarter 1/quarter 1/quarter 1/quarter	Report est. (gpd) ≤300 mg/l ≤45 mg/l ≤15 mg/ (vis. Y/N) 6.0 to 9.0 s.u.
Treated Sanitary Wastewater	Flow BOD_5 TSS pH fecal coliform	1/quarter 1/quarter 1/quarter 1/quarter 1/quarter	Report meas. (gpd) ≤ 45 mg/l ≤ 45 mg/l 6.0 to 9.0 s.u. ≤ 400 col./100 ml

* Permit requires an increase in the sampling frequency when an exceedance occurs

The non-stormwater discharges addressed by the West Hackberry SWPPP are routine discharges of: fire water (including fire pump packing gland seepage), air conditioner condensate, inspection pit discharges, ground water discharges, potable water system line discharges for maintenance, exterior building and piping wash down with no additives prior to painting/maintenance, and hydrostatic test waters under separate general permit control.

5.5 SURFACE WATER QUALITY SURVEILLANCEMONITORING

During 2005, surface waters of the Bayou Choctaw, Big Hill, Bryan Mound, and West Hackberry SPR sites were sampled and monitored for general water quality according to the SPR Environmental Monitoring Plan. Monitoring is conducted to provide early detection of surface water quality degradation resulting from SPR operations. It is separate from, and in addition to, the water discharge permit monitoring program.

Data and statistics are presented in tabular form, by site, in Tables 5-12 through 5-15. All observed values that were below detectable limit (BDL) were assigned a value of one-half the detection limit for statistical calculation purposes. In addition to commonly used summary statistical methods, the coefficient of variation (CV) treatment was incorporated to identify data sets with a high incidence of variation. Values approaching or exceeding 100 percent indicate that one standard deviation from the stated mean encompasses zero. This method draws attention to highly variable or skewed data sets for further evaluation. Extremely low values of CV (approaching or equal 0 percent) indicate the standard deviation is small, relative to the mean, such as would be the case with very stable data, or if a preponderance of the measurements fell below the method limit of detectability.

5.5.1 Bayou Choctaw

Samples were collected and analyzed monthly, where possible, for seven surface water-monitoring stations. Irregular station sampling was due to the 2005 hurricane season, and the drought that caused a lack of available water for sampling. Monitoring stations A through G are identified in

Figure 5-1. Parameters monitored (Table 5-12) include pH, salinity (SAL), temperature, dissolved oxygen (DO), oil and grease (O&G), and total organic carbon (TOC). A discussion of each parameter follows.

5.5.1.1 Hydrogen Ion Activity (pH)

The annual median values of pH for all the monitored stations ranged from 7.1 to 7.4 s.u. which is consistent with the ambient conditions of surrounding waters. The complete range for all measurements at all stations for 2005 is 6.4 to 8.6 s.u. Fluctuations observed are attributed to environmental and seasonal factors such as variations in rainfall, temperature, and aquatic system flushing.

5.5.1.2 Temperature

Observed temperature ranged from 13 ºC to 31ºC. Temperature fluctuations were consistent among all stations and are attributed solely to meteorological conditions since the Bayou Choctaw site produces no thermal discharges.

5.5.1.3 Salinity (SAL)

In 2005, average annual salinities ranged from 0.5 ppt (indicating below detectable limits) to 1.4 ppt (Station B). Wetland stations A, E, F and G revealed below detectable limits throughout the year in their respective databases for 2005. It is believed these values are a response to the return of normal rainfall. The largest measurement (3.1 ppt) occurred at Station C this year.

5.5.1.4 Oil and Grease (O&G)

Four of the 7 stations had all 4 samples below the detectable limit (2.5 mg/L), while the remaining 3 (Stations A, C, and D) each had 1 sample above detection. The three measured values ranged from 5.8 to 6.7 mg/l. These data favorably reflect continued good site housekeeping and effective site spill prevention, control, and response efforts.

5.5.1.5 Dissolved Oxygen (DO)

Overall, DO average and median levels are low (below the minimum threshold <5 mg/L). These low numbers are attributed to high temperature and high natural organic loading combined with low flow and minimal flushing typically observed at times in the two wetland area stations. Peak levels approaching 8.3 mg/l are attributed to high primary productivity.

5.5.1.6 Total Organic Carbon (TOC)

Average annual TOC concentrations ranged from 8.7 to 12.7 mg/l. High TOC readings typically correlate with high organic loading that is usually found in stagnant or sluggish water bodies of limited volume, such as an evaporating pool of water. However, the highest value measured was only 18.6 mg/l occurring at Station B. The relatively low values observed around the site sampling locations as well as the peaks produced no discernible physical impacts and are not out of line with the natural setting or system receiving episodic rainfall.

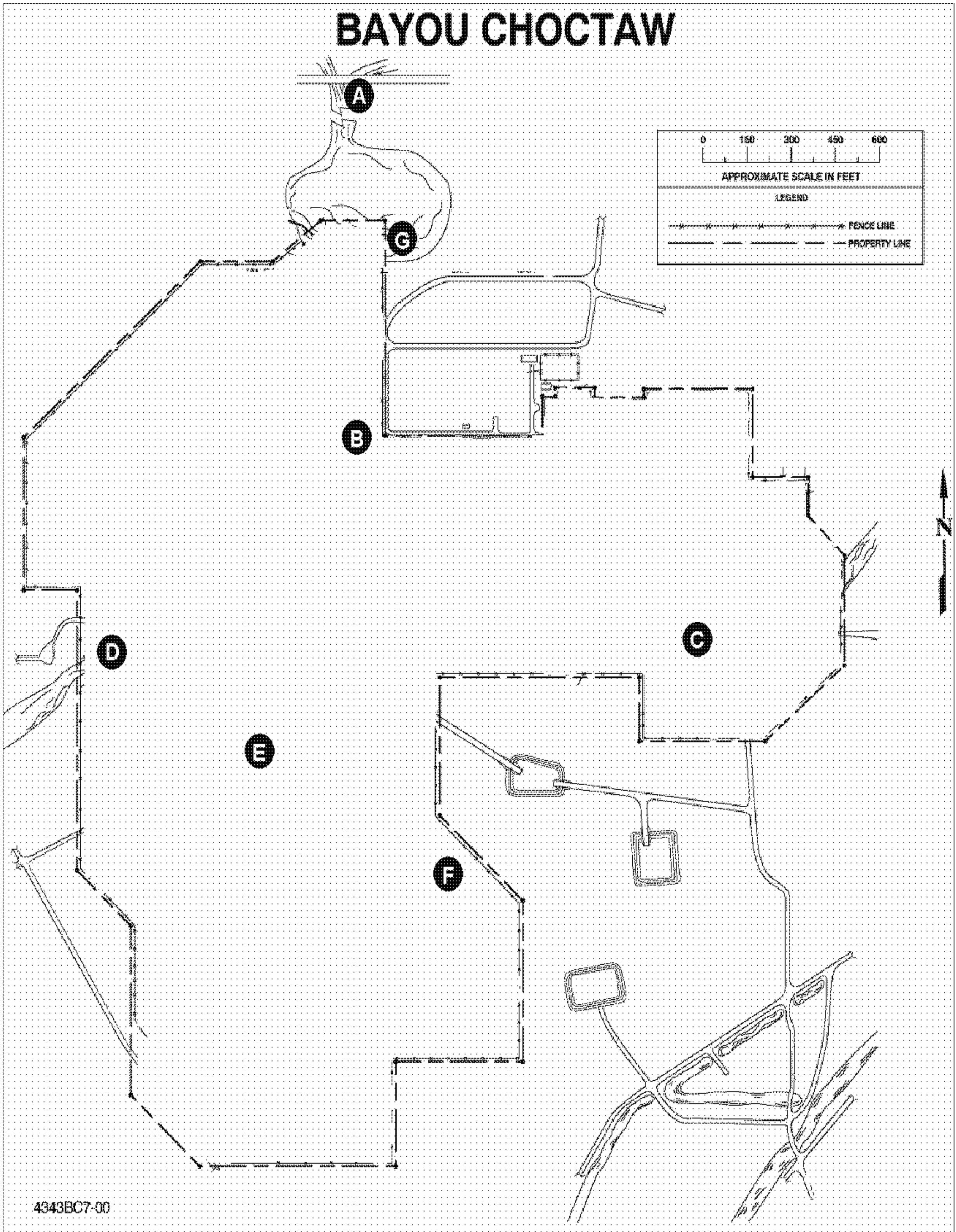


Figure 5-1. (Sheet 1 of 2) Bayou Choctaw Environmental Monitoring Stations

Water Quality Monitoring Stations

A. Canal north of Cavern Lake at perimeter road bridge
B. Ditch running under the road to warehouse on West side of the road in area of heat exchangers.
C. East-West Canal at Intersection of road to brine disposal wells
D. East-West Canal
E. Wetland Area
F. Wetland Area
G. Near Raw Water Intake

Figure 5-1. (Sheet 2 of 2) Bayou Choctaw Environmental Monitoring Stations

Table 5-12. 2005 Data Summary for Bayou Choctaw Monitoring Stations

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
A	Sample Size	11	11	11	4	11	11
	Number of BDL	0	NV	11	3	0	0
	Maximum	8.5	30.2	0.5	6.1	7.4	16.6
	Minimum	6.8	13.7	0.5	2.5	1.8	4.8
	Mean	NV	20.4	0.5	3.4	3.8	8.7
	Median	7.1	18.7	0.5	2.5	4.1	8.3
	Standard Deviation	NV	5.6	0	1.8	1.6	3.8
	Coefficient of Variation	NV	27.2	0	52.9	43.2	44.1
B	Sample Size	9	9	9	4	9	9
	Number of BDL	0	NV	4	4	0	0
	Maximum	7.7	30.7	2.7	2.5	5.1	18.6
	Minimum	6.7	13.4	0.5	2.5	2.0	5.5
	Mean	NV	20.1	1.4	2.5	3.5	10.5
	Median	7.1	18.3	1.5	2.5	4.0	9.9
	Standard Deviation	NV	6.6	0.9	0	1.1	4.6
	Coefficient of Variation	NV	32.7	64.4	0	30.2	43.5
C	Sample Size	11	11	11	4	11	11
	Number of BDL	0	NV	5	3	0	0
	Maximum	8.4	30.1	3.1	6.7	8.3	17.3
	Minimum	6.8	13.5	0.5	2.5	1.6	6.6
	Mean	NV	20.3	1.3	3.6	3.6	10.9
	Median	7.1	17.8	1.3	2.5	3.1	9.1
	Standard Deviation	NV	5.6	0.9	2.1	2.0	4.2
	Coefficient of Variation	NV	27.7	68.0	59.2	55.2	38.7
D	Sample Size	11	11	11	4	11	11
	Number of BDL	0	NV	8	3	0	0
	Maximum	8.3	30.6	3.0	5.8	7.6	12.1
	Minimum	6.8	13.8	0.5	2.5	0.8	4.8
	Mean	NV	20.3	1.0	3.3	3.3	8.8
	Median	7.2	17.9	0.5	2.5	2.9	9.3
	Standard Deviation	NV	5.7	0.9	1.7	1.8	2.4
	Coefficient of Variation	NV	28.2	89.2	49.6	54.7	27.9
E	Sample Size	9	9	9	4	9	9
	Number of BDL	0	NV	9	4	0	0
	Maximum	8.5	31.2	0.5	2.5	5.3	17.3
	Minimum	6.8	13.0	0.5	2.5	0.2	6.2
	Mean	NV	20.4	0.5	2.5	2.3	12.5
	Median	7.1	18.6	0.5	2.5	2.3	13.0
	Standard Deviation	NV	6.4	0	0	2.0	3.9
	Coefficient of Variation	NV	31.6	0	0	85.0	31.4

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

Table 5-12 2005 Data Summary for Bayou Choctaw Monitoring Stations (continued)

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
F	Sample Size	10	10	10	4	10	10
	Number of BDL	0	NV	10	4	0	0
	Maximum	8.2	30.7	0.5	2.5	4.9	16.5
	Minimum	6.5	13.1	0.5	2.5	0.4	7.4
	Mean	NV	20.6	0.5	2.5	2.5	12.7
	Median	7.3	18.1	0.5	2.5	2.6	13.0
	Standard Deviation	NV	6.2	0	0	1.8	3.1
	Coefficient of Variation	NV	29.9	0	0	68.9	24.4
G	Sample Size	11	11	11	4	11	11
	Number of BDL	0	NV	11	4	0	0
	Maximum	8.6	30.0	0.5	2.5	8.3	17.5
	Minimum	6.4	13.9	0.5	2.5	2.0	4.1
	Mean	NV	20.5	0.5	2.5	4.8	8.9
	Median	7.4	18.2	0.5	2.5	4.6	9.1
	Standard Deviation	NV	5.6	0	0	1.6	3.8
	Coefficient of Variation	NV	27.1	0	0	33.2	42.0

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

5.5.1.7 General Observations

Based on the above discussion, the following general observations are made regarding the quality of Bayou Choctaw surface waters.

a. The surrounding surface waters continue to have a relatively neutral pH.

b. Observed salinity measurements remained generally low and within the historical range. Many stations reflected evidence of the apparent break in the longstanding drought as 4 of 7 stations reported no measurable salinity at all.

c. Temperature variations were caused by seasonal changes. There are no thermal processes used at any SPR site.

d. Low DO levels are attributed to high temperatures and organic loading resulting from low flow and minimal flushing typically observed in backwater swamp areas.

e. Only 3 stations measured oil and grease levels above the method detection limit confirming that site oil inventories are effectively managed, minimizing any impact on the Bayou Choctaw environs.

5.5.2 Big Hill

Monitoring stations were established at five locations (Figure 5-2) to assess site-associated surface water quality and to provide early detection of any surface water quality degradation that may result from SPR operations. It should be noted that Station A only has one sample. Because this sample point is located at an overflow point to the Stock Pond receiving the site's treated sewage, it has become rare that a monthly flowing surface water sample can be taken due to low rainfall and the infrequent batching from the STP. Parameters including pH, temperature, salinity (SAL), oil and grease (O&G), dissolved oxygen (DO), and total organic carbon (TOC) were monitored (Table 5-13).

5.5.2.1 Hydrogen Ion Activity (pH)

The 2005 data show the pH of site and surrounding surface waters remained between 6.6 and 8.2 s.u. The annual median values of pH for each of the monitored stations ranged from 7.3 to 7.6 s.u.

5.5.2.2 Temperature

Temperatures observed in 2005 ranged from 11ºC to 33ºC exhibiting the characteristics expected from seasonal meteorological changes. With the exception of Station A, temperature fluctuations were very similar among stations.

5.5.2.3 Salinity (SAL)

Annual average salinities were generally quite low throughout most of the year ranging from fresh on the site all year long to a maximum of 20 ppt at the RWIS location on the ICW (Station C) nearer to the Gulf. Because of its location, Station C also had a higher mean (10.3 ppt) and a higher median (11.3 ppt) compared to the other stations. No brine releases or chronic impacts are indicated.

5.5.2.4 Oil and Grease (O&G)

No oil & grease value was found above the historic detectable limit of 5 mg/l this year. No indication of oil impacts from SPR activities was found or observed during the sampling episodes. The range of all values was from 1.1 mg/l to 2.4 mg/l. The range of means for 12 total measurements from the 4 stations was from 1.1 mg/l to 1.6 mg/l. Station A had no O&G sampling in this data set.

5.5.2.5 Dissolved Oxygen (DO)

Dissolved oxygen generally is greatest in the winter and spring and lowest from summer through fall. DO peaks were observed in the months of January and March and the lowest values were determined in June, August, and November. The lowest variability was found at the RWIS (Station C) and at Station D with the COV respectfully being 26.4 and 33.9 where the greater flows and depths provide a more constant dissolved oxygen level. The station with the most DO variability during the year was Sampling station E with a coefficient of variability of 53.5. The overall range in DO was found to be 6 mg/L to 10.2 mg/l with a mean range of 3.9 mg/L to 10.2 mg/l from all sites tested during the year. Both Stations B and E produced samples with DO levels below 1 mg/L, a level that cannot support much aerobic life.

5.5.2.6 Total Organic Carbon (TOC)

Average annual TOC concentrations varied from 7.8 to 24.9 mg/l over the year at the five monitoring stations. Total TOC samples ranged from 5.6 to 43.4 mg/l. Station D, located at Pipkin Reservoir had significantly higher levels of TOC than any other station. The higher TOC levels observed are believed indicative of post-Hurricane Rita biological decomposition events. These samples were collected during October and November 2005, following the late September hurricane event.

5.5.2.7 General Observations

Based on the above discussion, the following general observations are made regarding the quality of Big Hill surface waters.

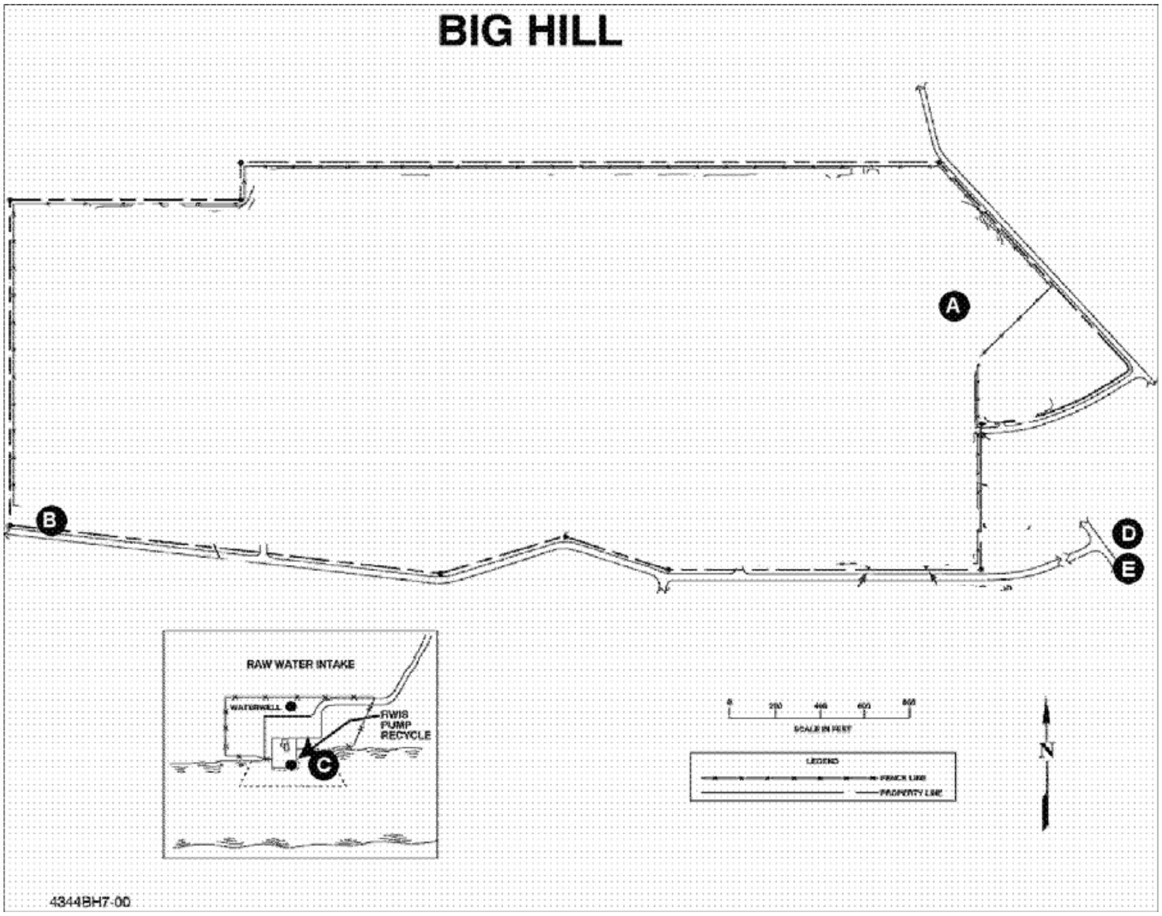
a. The fresh surface waters had a nearly neutral pH, but pH was generally found to be higher in brackish water as expected.

b. The observed salinity measurements were low on the site and increased in natural fashion from fresh water at the site to an intermediate brackish and highly variable water regime at the ICW.

c. Surrounding surface waters were neither contaminated nor affected by SPR crude oil.

d. Temperature variations followed seasonal meteorological changes.

e. In general, low dissolved oxygen and high total organic carbon fluctuations were within typical ranges indicative of seasonal meteorological and biological influences for such a setting and range of environments. Although DO levels reached lows that are unfavorable to sustain life, TOC levels did not exceed permit standards.



Water Quality Monitoring Stations

A Pond receiving effluent from site sewage treatment plant (STP)
B Wilbur Road ditch – southwest of site
C RWIS at Intracoastal Waterway
D Pipkin Reservoir – (1.8 Miles from map location)
E Gator Hole (3.1 Miles from map location)

Figure 5-2. Big Hill Environmental Monitoring Stations

Table 5-13. 2005 Data Summary for Big Hill Monitoring Stations

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
A	Sample Size	1	1	1	0	1	1
	Number of BDL	0	NV	1	0	0	0
	Maximum	7.3	21.0	0.5	0	10.2	7.8
	Minimum	7.3	21.0	0.5	0	10.2	7.8
	Mean	NV	21.0	0.5	0	10.2	7.8
	Median	7.3	21.0	0.5	0	10.2	7.8
	Standard Deviation	NV	0	0	0	0	0
	Coefficient of Variation	NV	0	0	0	0	0
B	Sample Size	11	11	11	3	11	11
	Number of BDL	0	NV	4	0	0	0
	Maximum	8.0	33.0	3.8	2.4	8.5	22.6
	Minimum	7.2	13.0	0.5	1.1	0.7	7.9
	Mean	NV	25.3	1.3	1.6	4.7	14.4
	Median	7.6	27.0	1.0	1.2	4.2	12.2
	Standard Deviation	NV	7.0	1.0	0.7	2.2	5.1
	Coefficient of Variation	NV	27.5	79.6	47.5	46.7	35.6
C	Sample Size	11	11	11	3	11	11
	Number of BDL	0	NV	0	0	0	0
	Maximum	7.9	31.0	20.0	1.2	8.4	13.9
	Minimum	6.9	12.0	1.1	1.1	3.8	5.6
	Mean	NV	23.8	10.3	1.1	5.6	8.3
	Median	7.6	26.0	11.3	1.2	5.2	7.1
	Standard Deviation	NV	6.6	6.3	2.9	1.5	2.9
	Coefficient of Variation	NV	27.6	61.2	2.5	26.4	35.2
D	Sample Size	11	11	11	3	11	11
	Number of BDL	0	NV	2	0	0	0
	Maximum	8.2	33.0	17.3	1.2	7.9	43.4
	Minimum	6.8	11.0	0.5	1.2	2.9	11.4
	Mean	NV	25.3	6.4	1.2	5.3	24.9
	Median	7.6	27.0	7.4	1.2	5.4	23.2
	Standard Deviation	NV	7.2	5.7	0	1.8	10.7
	Coefficient of Variation	NV	28.3	88.2	0	33.9	43.0
E	Sample Size	11	11	11	3	11	11
	Number of BDL	0	NV	0	0	0	0
	Maximum	7.7	31.0	16.6	1.2	7.2	27.0
	Minimum	6.6	13.0	1.3	1.1	0.6	11.1
	Mean	NV	24.8	6.9	1.2	3.9	16.7
	Median	7.3	28.0	6.3	1.2	3.9	15.2
	Standard Deviation	NV	6.4	4.7	0	2.1	5.0
	Coefficient of Variation	NV	25.9	68.3	4.3	53.5	29.8

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

5.5.3 Bryan Mound

Surface waters surrounding the Bryan Mound site were monitored during 2005. Blue Lake has seven sampling stations and Mud Lake has three established stations.

Surface water monitoring stations are identified in Figure 5-3. Stations A through C and E through G are located along the Blue Lake shoreline to monitor effects of site runoff. Station D, located farther away from the site in Blue Lake, serves as a control. Stations H and I are located along the Mud Lake shoreline to monitor effects of site runoff. Station J, which is located near the central point of Mud Lake, serves as a control. The results from these controls will not be included in the analysis, but will serve as reference.

Parameters monitored in the Bryan Mound surface waters include pH, temperature, salinity (SAL), oil and grease (O&G), Dissolved Oxygen (DO), and total organic carbon (TOC) (Table 5-15).

Drought, along with low tides kept Mud lake levels low throughout the year inhibiting monthly sampling during working hours. Therefore, only 6 samples were taken during 2005.

5.5.3.1 Hydrogen Ion Activity (pH)

In 2005 the pH of Blue Lake and Mud Lake ranges from 6.3 to 9.8 s.u. for the dataset. The control point for Blue Lake produced a similar range of 6.9 s.u to 8.7 s.u.. The range for the Mud Lake control was 7.5 to 8.3. The results reveal a slightly basic condition for Mud and Blue Lakes, while also proving an analogous condition for the controls. All stations in Blue and Mud Lake were generally found to be slightly basic throughout the sample year. These data are indicative of natural waters devoid of carbon dioxide and generally hard in regard to mineral content. Marine and brackish waters, such as those in Blue Lake and Mud Lake, typically have somewhat elevated pH levels and high mineral content.

The pH fluctuations measured this year are comparable to the normal range of variability historically seen at the Bryan Mound site.

5.5.3.2 Temperature

Temperatures observed in 2005 ranged from 13.3º C to 34.5º C and reflect nearly a complete set of monthly ambient surface water testing. The deduction can be made, however, that the range of fluctuations are attributed to meteorological events.

5.5.3.3 Salinity (SAL)

Observed salinity fluctuations ranged from 0.1 ppt to only 1.5 ppt in Blue Lake and from 4.7 ppt to 16.7 ppt in Mud Lake. Salinity fluctuations are attributed to meteorological and tidal conditions rather than site operations, since salinity observed at control sample stations D and J varied consistently with those found along site shorelines. The higher salinity values in Mud Lake are primarily caused by the strong tidal and wind influence on the lake, and its more direct link with the nearby Gulf of Mexico through the Intracoastal Waterway. This year's dataset reflects the return to more normal rainfall patterns very similar to last year.

5.5.3.4 Oil and Grease (O&G)

All of the O&G measurements made during the course of the 2005 calendar year were found below the method detectable limit of 5 mg/l. These data are reflective of effective spill prevention and good housekeeping practices being maintained.

5.5.3.5 Dissolved Oxygen (DO)

During 2005, DO was measured six to twelve times from all stations during the year. Sufficient water was available for measurement in both Blue and Mud Lake stations throughout all seasons this year. This year, presumably in response to the abundant and regular rainfall, both lakes revealed no differences or significant seasonality in terms of oxygen content. Fluctuations in DO levels are consistent with both control points. Therefore, all measurements indicate "no apparent impact" from SPR operations. While some samples for Blue Lake reached below a level that readily sustains most life (5mg/L), means and medians that range from 7.7 mg/l to 8.6 mg/L and 7.5 mg/L to 9.2 mg/L verify that these low DO levels are infrequent. Mud Lake also had samples with low DO, but higher means—(6.8 to 7.2 mg/L) and higher medians—(7.2 mg/L) support the likelihood that low DO levels are infrequent and fluctuate.

5.5.3.6 Total Organic Carbon (TOC)

In 2005, the measurements of Blue Lake ranged from 9.4 to 43.8 mg/l. The TOC observations in Mud Lake were lower but more variable ranging from the 2.6 mg/l to 35.9 mg/l. Both control points have results that are similar to the two lakes. Higher TOC measured in Blue Lake is attributed to primary productivity and low volumetric flushing. The TOC levels observed in both lakes, however, are indicative of healthy unaffected ambient conditions.

5.5.3.7 General Observations

Based on the above discussions, the following general observations are made regarding the quality of Bryan Mound surface waters.

a. The observed pH was stable for the period tested and slightly basic in both Blue Lake and Mud Lake, but typical of brackish waters. Of the two receiving waters, Blue Lake slightly more basic again this year.

b. Temperature and salinity fluctuations observed during the period tested are attributed to meteorological and tidal conditions rather than site operations.

c. Higher TOC levels observed in Blue Lake are attributed to higher primary productivity and low flushing of this surface water body.

d. The dissolved oxygen level measured in both Blue Lake and Mud Lake was within typical ranges indicative of seasonal, meteorological, and biological influences for such a setting and environment.

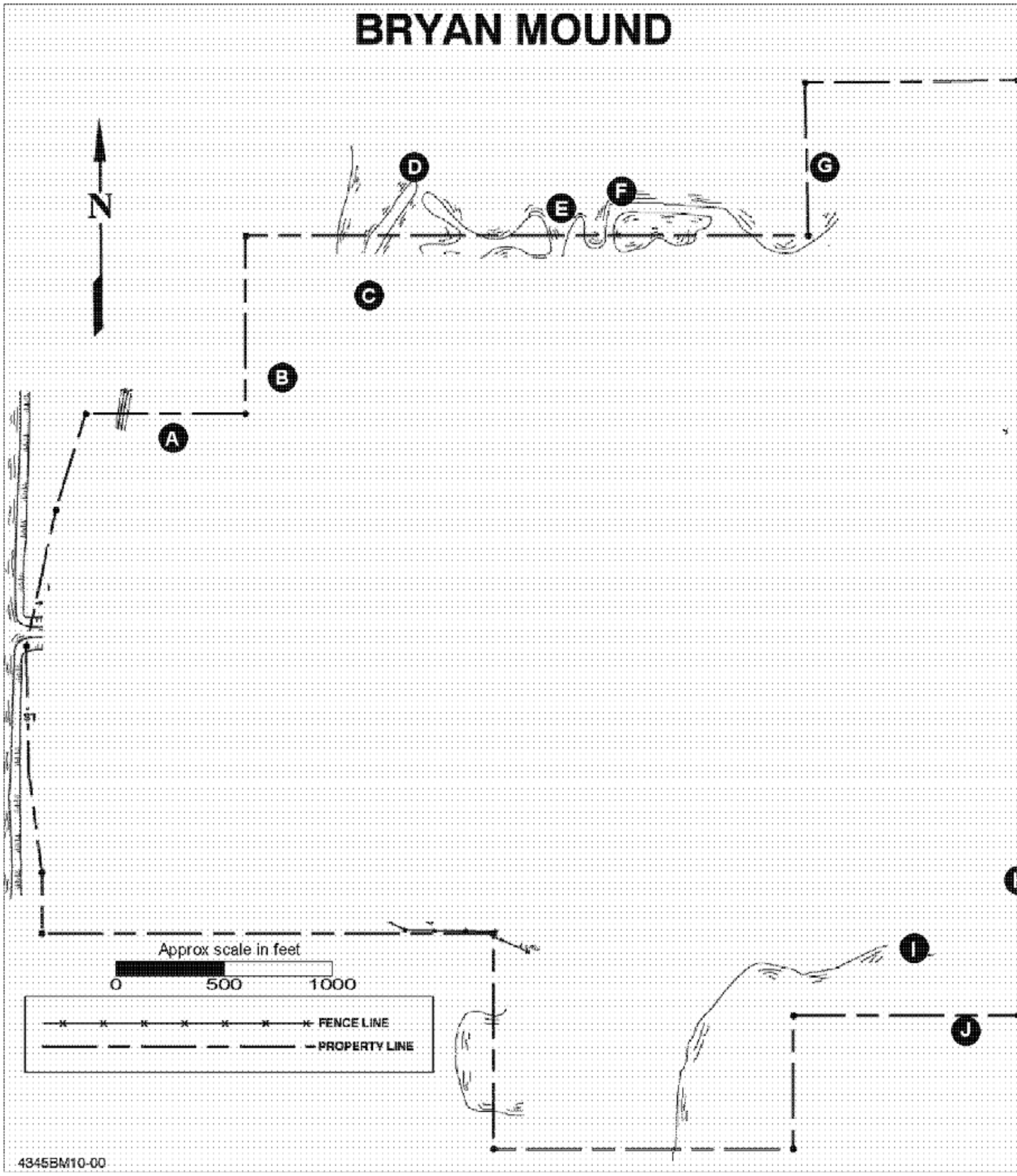


Figure 5-3. (Sheet 1 of 2) Bryan Mound Environmental Monitoring Stations

Water Quality Monitoring Stations

A	Blue Lake
B	Blue Lake
C	Blue Lake
D	Blue Lake - Control Point 1
E	Blue Lake
F	Blue Lake
G	Blue Lake
H	Mud Lake
I	Mud Lake
J	Mud Lake – Control Point 2

Figure 5-3. (Sheet 2 of 2) Bryan Mound Environmental Monitoring Stations

Table 5-14. 2005 Data Summary for Bryan Mound Monitoring Stations

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
A	Sample Size	12	12	12	4	12	11
	Number of BDL	0	NV	0	4	0	0
	Maximum	8.4	34.5	1.4	2.5	14.4	38.5
	Minimum	6.3	14.0	0.1	2.5	1.4	11.0
	Mean	NV	23.7	1.1	2.5	7.9	17.4
	Median	7.6	25.2	1.2	2.5	9.2	15.2
	Standard Deviation	NV	6.3	0.3	0	4	7.5
	Coefficient of Variation	NV	26.8	31.8	0	50.4	43.1
B	Sample Size	12	12	12	3	12	11
	Number of BDL	0	NV	0	3	0	0
	Maximum	8.8	33.8	1.5	2.5	13.5	43.8
	Minimum	6.3	14.0	0.1	2.5	1.1	10.1
	Mean	NV	23.8	1.1	2.5	8.0	17.5
	Median	8.3	25.4	1.2	2.5	8.8	15.4
	Standard Deviation	NV	6.3	0.4	0	3.3	9.4
	Coefficient of Variation	NV	26.6	32.9	0	41.8	53.9
C	Sample Size	12	12	12	3	12	11
	Number of BDL	0	NV	0	3	0	0
	Maximum	8.8	33.8	1.5	2.5	13.1	43.4
	Minimum	6.8	13.5	0.1	2.5	1.1	9.5
	Mean	NV	23.7	1.1	2.5	7.9	17.4
	Median	8.4	25.2	1.2	2.5	8.6	16.2
	Standard Deviation	NV	6.5	0.4	0	3.3	9.1
	Coefficient of Variation	NV	27.3	33.3	0	42.2	52.4
D	Sample Size	12	12	12	3	12	11
	Number of BDL	0	NV	0	3	0	0
	Maximum	8.7	34.2	1.5	2.5	12.9	42.7
	Minimum	6.9	13.7	0.1	2.5	1.0	8.9
	Mean	NV	23.8	1.1	2.5	8.1	18.1
	Median	8.6	25.0	1.2	2.5	8.3	15.4
	Standard Deviation	NV	6.6	0.4	0	3.3	9.5
	Coefficient of Variation	NV	27.8	33.0	0	40.9	52.3
E	Sample Size	12	12	12	3	12	11
	Number of BDL	0	NV	0	3	0	0
	Maximum	8.8	33	1.5	2.5	13.3	42.5
	Minimum	6.7	13.6	0.1	2.5	2.6	9.8
	Mean	NV	23.7	1.1	2.5	7.7	17
	Median	7.9	25	1.2	2.5	7.5	14.6
	Standard Deviation	NV	6.5	0.4	0	3.1	8.8
	Coefficient of Variation	NV	27.5	33.0	0	39.9	51.7

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

Table 5-14 2005 Data Summary for Bryan Mound Monitoring Stations (continued)

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
F	Sample Size	12	12	12	3	12	11
	Number of BDL	0	NV	0	3	0	0
	Maximum	9.8	33	1.5	2.5	12.9	43.4
	Minimum	6.9	13.3	0.1	2.5	5	9.7
	Mean	NV	23.7	1.1	2.5	8.5	17
	Median	8.5	24.7	1.2	2.5	8.7	14.5
	Standard Deviation	NV	6.6	0.4	0	2.4	9.1
	Coefficient of Variation	NV	28	33	0	28.2	53.6
G	Sample Size	12	12	12	3	12	11
	Number of BDL	0	NV	0	3	0	0
	Maximum	8.7	32.3	1.5	2.5	12.9	43
	Minimum	7	13.6	0.1	2.5	5	9.4
	Mean	NV	23.7	1.1	2.5	8.6	17.2
	Median	8.3	24.8	1.2	2.5	9.1	15.5
	Standard Deviation	NV	6.5	0.4	0	2.5	8.9
	Coefficient of Variation	NV	27.4	33.0	0	29.7	51.9
H	Sample Size	6	6	6	2	6	5
	Number of BDL	0	NV	0	2	0	0
	Maximum	8.2	31.5	16.7	2.5	11.3	34.1
	Minimum	7	25.3	7.9	2.5	0.8	3.2
	Mean	NV	28.4	11.4	2.5	6.8	10.0
	Median	7.5	28.8	10.7	2.5	7.2	3.9
	Standard Deviation	NV	2.4	3.4	0	3.7	13.5
	Coefficient of Variation	NV	8.3	29.4	0	54.7	135.2
I	Sample Size	6	6	6	2	6	5
	Number of BDL	0	NV	0	2	0	0
	Maximum	8.3	30.3	16.5	2.5	10.7	35.9
	Minimum	6.8	25.0	4.7	2.5	3.9	2.6
	Mean	NV	27.9	11.4	2.5	7.2	10.2
	Median	7.7	28.3	11.8	2.5	7.2	3.9
	Standard Deviation	NV	2.2	4.6	0	2.5	14.4
	Coefficient of Variation	NV	7.7	40.5	0	34.8	141.4
J	Sample Size	6	6	6	2	6	5
	Number of BDL	0	NV	0	2	0	0
	Maximum	8.3	29.9	16.7	2.5	11.1	35.1
	Minimum	7.5	24.6	7.8	2.5	3.1	4.4
	Mean	NV	27.9	12.0	2.5	7.0	11.2
	Median	7.9	28.8	11.3	2.5	7.4	5.5
	Standard Deviation	NV	2.2	3.6	0	2.9	13.4
	Coefficient of Variation	NV	8.0	30.3	0	41.5	118.9

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

5.5.4 West Hackberry

In 2005, six surface water quality stations (Figure 5-4) were monitored monthly (where practicable) at West Hackberry. Parameters monitored (Table 5-15) include pH, temperature, salinity (SAL), dissolved oxygen (DO), oil and grease (O&G), and total organic carbon (TOC).

5.5.4.1 Hydrogen Ion Activity (pH)

The pH of surface waters ranged between 6.6 and 8.7 s.u., and annual median values ranged from 7.3 to 8.2 s.u. from all stations. The ambient waters measured were very similar to last year's data. Two stations (D&E) located in stormwater ditches eventually exiting the main site produced higher values of 8.7 and 8.2 s.u. respectively. These numbers reflect travel paths and long but intermittent travel times over crushed limestone placed for erosion control and trafficability. These two stations generally reveal more basic run-off than those of the larger volume and free-flowing receiving water stations.

Compared to other sites, fluctuations observed are relatively minor and attributed to environmental and seasonal factors such as variation in rainfall, temperature, algae and biotic growth, aquatic system flushing and the buffering effects of crushed limestone gravel on slightly acidic rainfall.

5.5.4.2 Temperature

Observed temperatures in 2005 were consistent with observations at other sites and were indicative of regional climatic effects. No off-normal measurements were observed. Recorded temperatures ranged from 14.0º C to 34.0º C and were found very consistent among stations.

5.5.4.3 Salinity (SAL)

Meteorological factors such as wind, tide, and rainfall contributed to the salinity variation observed in brackish Black Lake (Stations A, B, and C) and the Intracoastal Waterway (Station F). Salinity ranges observed in these water bodies (1.4 to 15.9 ppt in Black Lake) and (0.5 to 16.7 ppt in the ICW) are more conducive to supporting euryhaline organisms and those with sufficient mobility to avoid salinity stresses that occur with seasonal changes. Station F on the ICW reflected a wider range due to the influences of the tides and proximity to diluted but saltier Gulf waters. However, mean annual salinity observed at the ICW (5.0 ppt) was lower than that of Black Lake (10.8 to 10.9 ppt) due largely to the fresher water influences received from more northerly drainage ways and salt water trapped in Black Lake from hurricane Rita's tidal surge. Stations D and E had the lowest salinities, with 20 out of 21 samples being BDL. Salinities observed at these two upland site stations were affected by surface runoff and not by Black Lake. The salinity mean in the drainage ditch at the southwest corner of the site (Station D) was 0.5 ppt, while the mean at the high pressure pump pad (Station E) was .6 ppt. These results confirmed a preponderance of values below the detection limit (BDL) for Stations D (11 of 11 samples BDL) and E (9 of 10 BDL).

5.5.4.4 Oil and Grease (O&G)

Observed O&G levels were below the detectable level (5 mg/l) for five of the six monitoring stations during 2005. Station A quantified a measurable O&G for 1 of the 3 samples, which valued at 5.1 mg/L. This station is in close proximity to the site's north shore and is involved with a lot of in-lake construction activity used for erosion control during a large portion of the year. But overall, the data reflect effective spill prevention and good housekeeping by site personnel.

5.5.4.5 Dissolved Oxygen (DO)

With the exception of Station E, minimum DO levels were at levels that support aquatic life, ranging from 4.0 to 5.2 mg/L. Dissolved oxygen was more variable at onsite Station E as opposed to the open and flowing receiving water stations. Since all other parameters have similar patterns with the other stations, Station E's variability and lower DO values can be attributed to natural factors, such as decreased aeration and increased biological oxygen demand. Greater surface area and water movement through currents and wave action provided continuous aeration of the lake and ICW water. Water movement at the onsite ditch (Station D) was sufficient enough to provide adequate aeration throughout 2005, which is supported by its higher mean and median values.

5.5.4.6 Total Organic Carbon (TOC)

TOC concentrations for 2005 ranged from 1.6 to 19.2 mg/l with Station F experiencing the highest single value during the year. This value is not out of line with the nature of the water bodies and is very consistent with the measurements obtained during the year at all Black Lake stations. The average annual TOC concentrations by station ranged from 8.1 to 11.2 mg/l with main site station E experiencing the most variability throughout the year producing the second highest values, and the lowest value overall. Because the variation is so consistent among the remaining stations, it is indicated that these measurements reflect a return of consistent rainfall to Black Lake and the surrounding environs.

5.5.4.7 General Observations

The following observations are made, based on the above discussion, concerning operational impacts on the West Hackberry aquatic environs.

a. pH and temperature remained fairly stable, generally slightly basic, and a little warmer overall and were only affected by seasonal factors.

b. Detectable salinity levels were found only in Black Lake and the ICW. The salinity measurements made throughout 2005 were consistent with the ambient and slightly brackish receiving water environment, reflective of the return of rainfall to the area.

c. Oil and grease levels were below the detectable limit at five of the six stations throughout 2005, which is indicative of good housekeeping. The one sample that had a detectable level was 5.1 mg/L, just 0.1 mg/L above the detection limits. The low value did not produce any noticeable or lasting effects.

d. With the exception of the high pressure pump pad (station E), dissolved oxygen levels at site and Black Lake stations were consistently high and did not appear adversely affected by site operations.

e. Total organic carbon concentrations were quite similar at all stations with the exception of station E throughout the year suggesting no substantial transient bio-contamination or ecological events. The increased variability at site run-off station E results from the wider range of measurements made there during the year but nothing indicative of any impact or impairment.

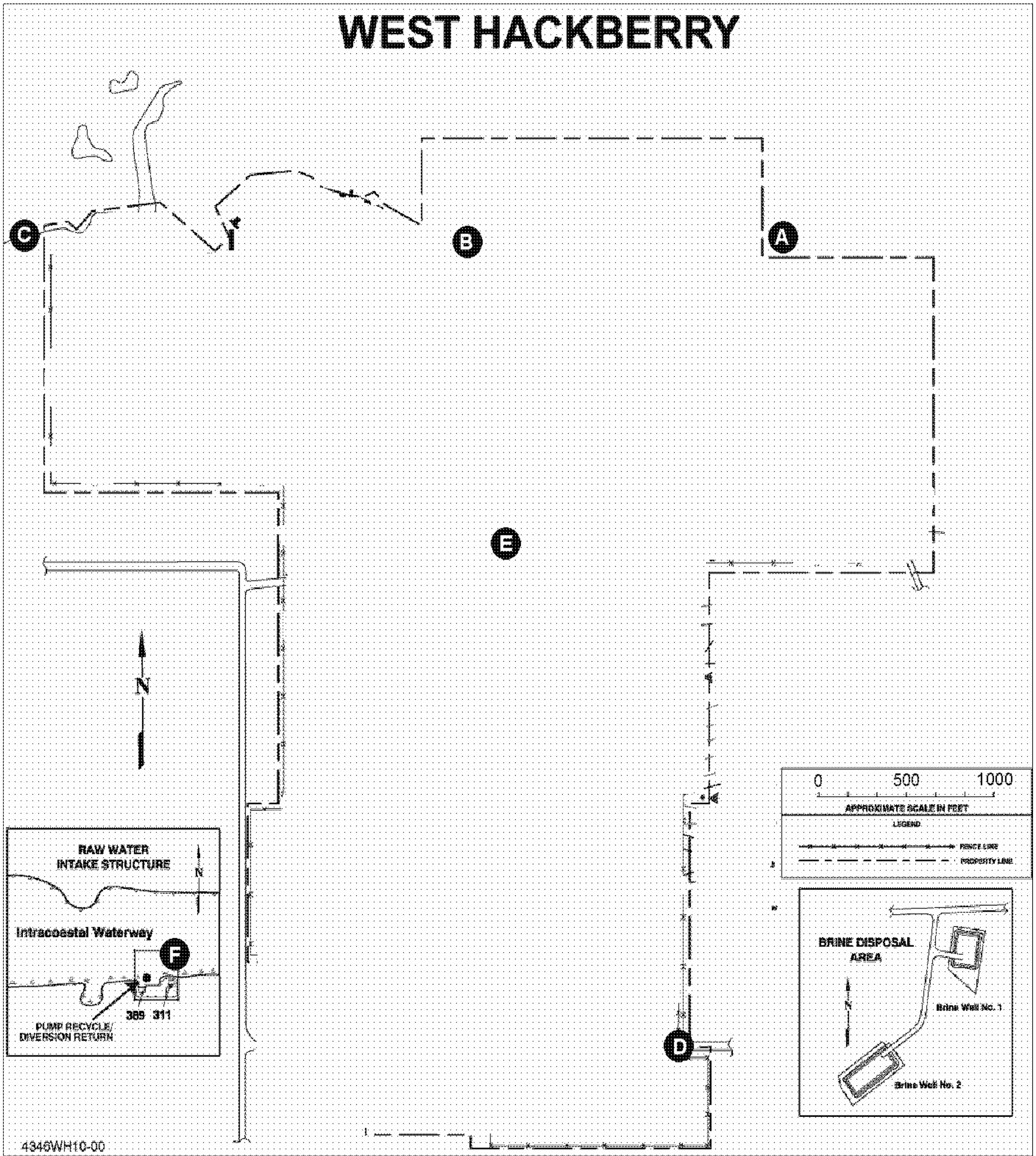


Figure 5-4. (Sheet 1 of 2) West Hackberry Environmental Monitoring Stations

Water Quality Monitoring Stations

A Black Lake

B Black Lake

C Black Lake

D Southeast drainage ditch

E High-pressure pump pad

F Raw water intake structure (Intracoastal Waterway)

Figure 5-4. (Sheet 2 of 2) West Hackberry Environmental Monitoring Stations

Table 5-15. 2005 Data Summary for West Hackberry Monitoring Stations

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
A	Sample Size	11	12	12	3	12	10
	Number of BDL	0	NV	0	2	0	0
	Maximum	8.3	32	15.9	5.1	8.6	13.7
	Minimum	7.5	14	1.4	2.5	5.1	2.6
	Mean	NV	24	10.8	3.4	6.8	9.2
	Median	7.8	23	12.2	2.5	7	8.5
	Standard Deviation	NV	6.3	5.3	1.5	1.2	3.2
	Coefficient of Variation	NV	26.1	48.9	44.6	18.2	35
B	Sample Size	12	12	12	3	12	10
	Number of BDL	0	NV	0	3	0	0
	Maximum	8.4	33	15.9	2.5	8.6	14.4
	Minimum	7.4	15	2.8	2.5	5.2	2.5
	Mean	NV	24.2	10.9	2.5	6.8	9.2
	Median	7.7	23	12.2	2.5	6.8	8.6
	Standard Deviation	NV	6.4	5.1	0	1.1	3.3
	Coefficient of Variation	NV	26.6	46.6	0	16.5	36.1
C	Sample Size	12	12	12	3	12	9
	Number of BDL	0	NV	0	3	0	0
	Maximum	8.4	34	15.8	2.5	9.1	14.4
	Minimum	7.4	15	2.7	2.5	4.8	2.1
	Mean	NV	24.6	10.8	2.5	6.8	8.9
	Median	7.8	23.5	12.1	2.5	6.7	8.6
	Standard Deviation	NV	6.3	5	0	1.2	3.2
	Coefficient of Variation	NV	25.7	46.2	0	17	36.4
D	Sample Size	11	11	11	3	11	10
	Number of BDL	0	NV	11	3	0	0
	Maximum	8.7	33.0	0.5	2.5	10.5	17.3
	Minimum	7.7	18.0	0.5	2.5	4	3.8
	Mean	NV	24.5	0.5	2.5	7.9	11.2
	Median	8.2	22.0	0.5	2.5	8.6	12.2
	Standard Deviation	NV	5.9	0	0	1.7	4.5
	Coefficient of Variation	NV	24.1	0	0	21.9	39.9

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

Table 5-15 2005 Data Summary for West Hackberry Monitoring Stations (continued)

Station	Statistical Parameters	pH (s.u.)	Temperature (deg. C)	Salinity (ppt)	Oil & Grease (mg/l)	Dissolved Oxygen (mg/l)	Total Organic Carbon (mg/l)
E	Sample Size	11	11	10	3	11	10
	Number of BDL	0	NV	9	3	0	0
	Maximum	8.2	30	1	2.5	10.5	17.3
	Minimum	6.9	19	0.5	2.5	1.8	1.6
	Mean	NV	23.8	0.6	2.5	5.4	8.1
	Median	7.6	22	0.5	2.5	4.8	7.5
	Standard Deviation	NV	4.7	0.2	0	2.5	4.5
	Coefficient of Variation	NV	19.6	28.7	0	46.5	56
F	Sample Size	11	12	12	3	12	10
	Number of BDL	0	NV	2	3	0	0
	Maximum	8	32	16.7	2.5	9.1	19.2
	Minimum	6.6	15	0.5	2.5	4.9	2.8
	Mean	NV	23.6	5	2.5	6.5	9.2
	Median	7.3	22.5	3.1	2.5	6.2	8.2
	Standard Deviation	NV	6.4	4.8	0	1.4	4.4
	Coefficient of Variation	NV	27.3	96.5	0	20.9	47.2

Note: BDL = Number of samples that were below the detectable limit.
NV = Not a valid number or statistically meaningful.

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6. SITE HYDROLOGY, GROUND WATER MONITORING AND PUBLIC DRINKING WATER PROTECTION

Ground water monitoring is performed at the Bayou Choctaw, Big Hill, Bryan Mound, and West Hackberry sites to comply with DOE Order 450.1, and also in the case of West Hackberry, a state agency agreement. Salinity is measured and the potential presence of hydrocarbons is screened at all sites. The monitoring scheme performed at West Hackberry is governed by an agreement between DOE and the LDNR to report annual ground water monitoring data through this document. At the Weeks Island site, long-term ground water monitoring has been accepted as complete as part of the state approved decommissioning plan. Bryan Mound ground water quality is conveyed annually to the RCT via copy of this report. Wells surrounding the operating brine storage and disposal pond system at Big Hill monitor groundwater as part of permit required leak detection. The St. James terminal has undergone a remediation to satisfy state criteria for some limited crude oil leakage. Because follow-on studies indicated the presence of only trace quantities, there is no permanent site-wide ground water monitoring at St. James facility, although attenuation of the crude oil continued throughout 2005.

Available ground water salinity data collected for the past five years are presented graphically, for the historic site well nets and for the more recently installed Periphery Well (PW) series. These data are then discussed within each site-specific section and any gaps in data for the graphs are noted. The graphs' Y-axes have been standardized with few noted exceptions at either the 0–10 ppt or 0–100 ppt as the baseline dependent upon the historical range, providing easier comparisons among the monitoring stations.

Each of the storage sites has a long history of industrialized development primarily involving the mining of salt and associated minerals that were used for various purposes and feedstock. A 10 ppt cut-off for salinity is used in this book in making comparisons for assessing affected and unaffected waters. This is not a regulatory limit but rather a value, given the setting that represents usable versus unusable water. Bryan Mound, because of its particular site specific and historic mining conditions, a 20 ppt cut-off is employed for evaluating the generalized ambient shallow ground water conditions there.

6.1 BAYOU CHOCTAW

The Plaquemine Aquifer, the main source of fresh water for the site and several surrounding municipalities, is located approximately 18 m (60 ft) below the surface and extends to a depth of 150 to 182 m (500-600 ft). The upper 18 m (60 ft) of sediment in the aquifer consists predominantly of Atchafalaya clay. The interface of freshwater and saline water occurs at a depth of 122 to 150 m (400-500 ft) below the surface. Ground water in the Plaquemine Aquifer communicates locally with the Mississippi River, flowing away from it during the high river stage and towards the river when in the low stage. Other local influences to the general flow patterns are manifested by structural features; such as the piercing salt domes and proximity to off-take.

Historically, there have been four monitoring wells (BC MW1, BC MW2, BC MW3, and BC MW4) circumscribing the brine storage pond at Bayou Choctaw (Figure 6-1). These wells were drilled roughly 9 m (30 ft) below land surface (bls) generally at the corners of the structure to monitor potential impact from the brine storage pond and any other potential nearby shallow contamination sources. Seven additional similarly screened wells were installed at various locations around the main site, and one off site near a selected brine disposal well pad. BC PW3 was plugged and abandoned in the original VWS study.

These periphery wells have now been added to the site's monitoring scheme to enhance evaluation of ground water flow direction and outlying salinity movements and variation. Those wells with a full five-year monitoring history, are also presented in this report. The CY 1996 Site Environmental Report contains a detailed overview of the Phase II (periphery well) studies of this site. An adjunct of these studies is the determination of an estimated linear velocity for the shallow ground water movement of the monitored zone. For Bayou Choctaw the water in the shallow zone moves an estimated 1.2 to 2.4 m (4 feet to 8 feet) per year in a generally radial direction off the main site and underlying dome, loosely mimicking the ground contours.

Groundwater salinity observed at all of the four pond wells (BC MW1 through BC MW4, Figure 6-2) has historically been above an ambient cut-off concentration of 10 ppt, somewhat high for a fresh water environment. This condition of elevated salinity is attributed to a previous owner's operational activities and possibly some more recent brine handling activities. Three of these wells (BC MW1, BC MW2, and BC MW3) exhibit 5 year traces this year that are either below or near the 10 ppt cut-off. All four wells exhibit seasonal salinity fluctuations that are affected by rainfall. Higher salinity values usually occur in late winter and early spring, and lower salinity measurements have been observed in late spring and summer. The former steep decline observed at well BC MW3 indicative of the passage of a small plume is now flattened and appears to be slowly responding to the muted effects of a former release event. BC MW1 although showing a slight increasing 5-year trace, has all of its measured values well below 10 ppt.

Past surface brine spills and other activities from previous occupants of the area may have also affected the ground water salinity observed in these shallow wells. The long-term salinity range observed at well BC MW3 that had been much greater than that of the other three historical wells appears to be returning to the ambient conditions more reflective of background, as observed with wells BC MW1 and BC MW2. Well BC MW4 located down gradient of the site and south of the E-W canal has revealed a somewhat elevated overall salinity concentration, but the long-term time-series trend remains downward. Much of the variability exhibited with the earlier data may have resulted from over purging and inconsistently applied sampling techniques. However, the advent of dedicated low-flow sampling apparatus and techniques has aided the ground water testing by assuring more representative sampling. Ground water surface piezometric data of all the wells indicate that ground water movement is radial in all directions from the high point on the dome around Cavern 15 and to the north. A 1991 brine spill on the nearby low pressure pump pad north of the well BC MW3 appears to have passed with the salinity trend flattening to around the 10 ppt cutoff. The southerly movement with the ground water flow now appears to be reaching the further down gradient well BC MW4.

The present five-year salinity trend of well BC MW4 defines a moderating salinity with time. The downward trend and the previous observed wide fluctuations appear to have moderated. This well is situated away from and down gradient of the brine pond.

Long-term salinity trends have been established which, when examined within the context of the radial ground water movement, assist in identifying possible areas or sources of contamination. With the exception of the stable to slightly rising trending at BC MW1, and the stable to slightly decreasing trending at BC MW2, each of the five-year trending charts for the Bayou Choctaw historical and periphery wells indicate decreasing salinity around the site.

As mentioned the well BC MW1, up gradient of the brine pond, has developed a slightly increasing salinity trend below 10 ppt primarily due to the "loss" of some historical but large values in the dataset at a point in time earlier than the current 5-year window. Well BC MW2, the intercept well immediately down gradient of the brine pond reveals another continuing five year trace of decreasing salinity even though there are some 1 ppt fluctuations.

With full implementation of the low-flow sampling methodology and the early more variable data no longer in the trend set more realistic groundwater conditions and trending of the data are evident. Well BC MW1 situated hydraulically on the up gradient side of the brine pond and well BC MW2 located immediately down gradient hydraulically of this potential source (see Figure 6-1) reveal opposing trends for their positions, possibly due to this effect. Another potential source of subsurface contamination may be residuals from historical activity that occurred along the northwest corner of the pond. Periphery well BC PW2 has encountered this area of existing affected ground water and the 5-year trace indicates a stable to slightly decreasing trend from 60 ppt to 50 ppt in this area that would be up gradient of and therefore not associated with the current brine pond operations.

Although it has in the past captured the most saline ground water on the site, BC MW3 is now existing an essentially stable trend. The slightly decreasing 5-year trend varying around the 10 ppt cut-off is now nudging below that level to ambient, suggesting the passage of an ephemeral impact of a former piping leak found and repaired near the low pressure pump pad in 1991. The data now indicate the impact of that piping break has recovered to ambient In addition, the variability commencing in mid-year 2001 may be some trailing effects of that historical event and changes in rainfall conditions from drought to more abundant and frequent rainfall.

Changes in sampling methodology implemented in 1995 and 1996 may have affected the historical trending at all positions. The overall general five-year decreasing trend found at most wells is definitely evident with this year's 5-year data window.

All of the PW well series data with five year history, indicate decreasing salinity trends over the current 5-year window. All of these monitored locations appear to fluctuate regularly over the entire period of record, but generally with decreasing trend lines for each well. Future ground water data, including that from the periphery wells added from the Phase II verification studies and ongoing inspections of the brine pond and site piping, will assist in identifying any contamination originating from SPR activities. The shallow ground water monitoring well net for this site is adequately placed and sampled to serve as a complete site-wide detection monitoring system.

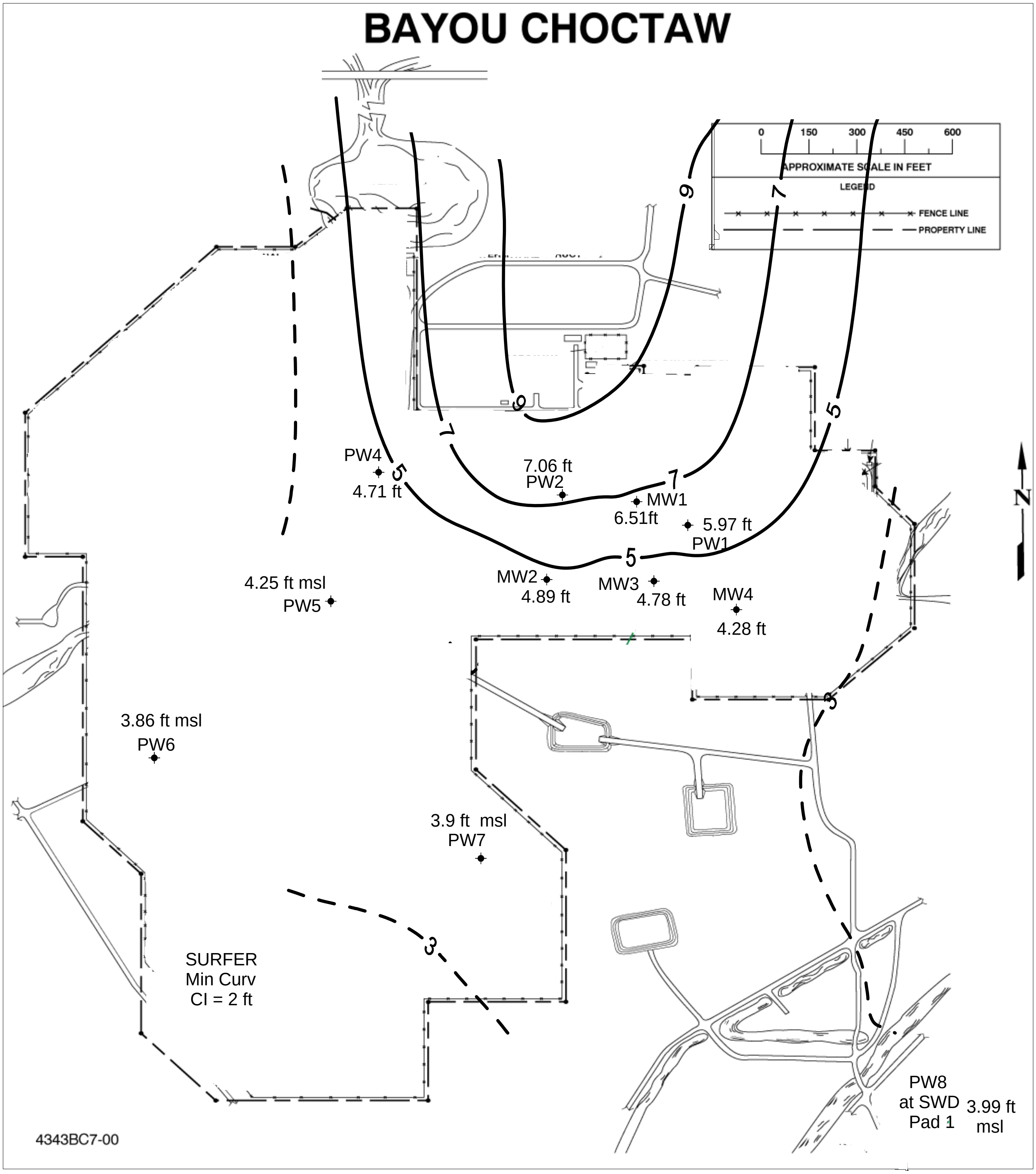
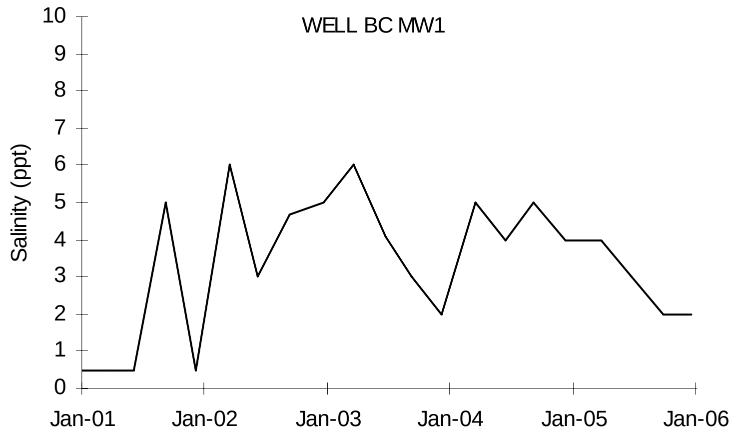
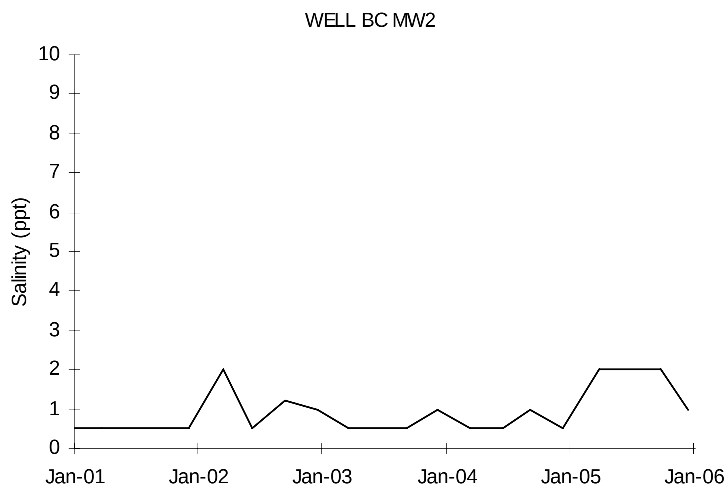


Figure 6-1. Bayou Choctaw Ground Water Monitoring Stations and Shallow Ground Water Contoured Elevations Summer 2005





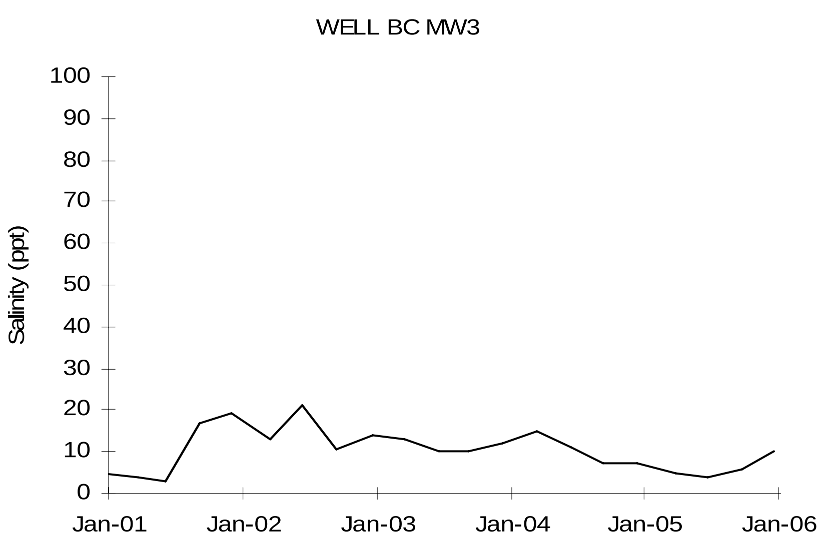
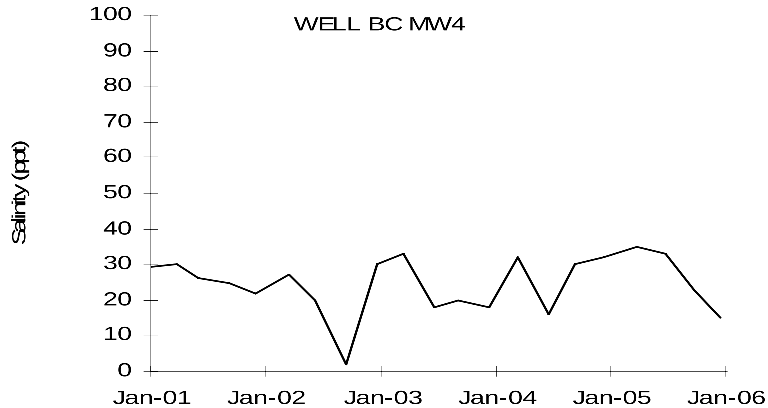
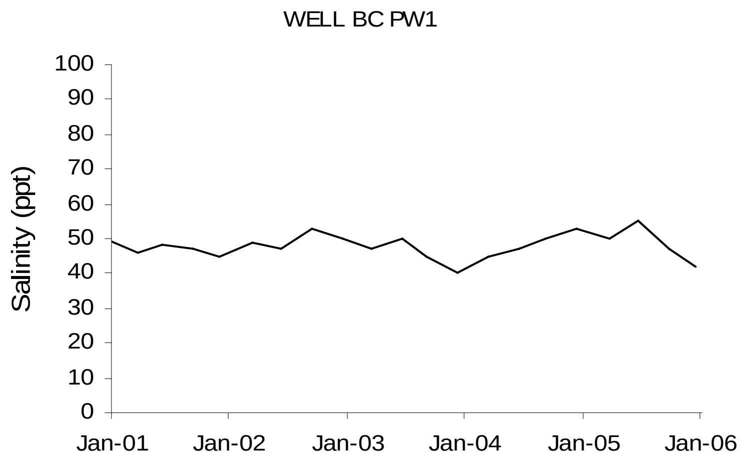


Figure 6-2. Bayou Choctaw Ground Water Monitoring Well Salinities





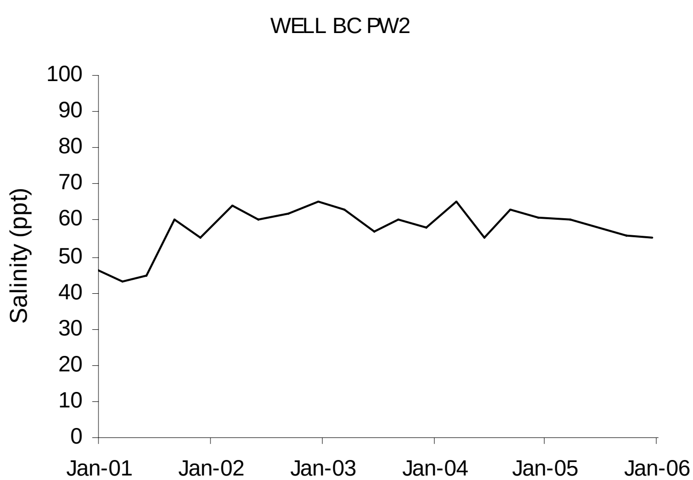
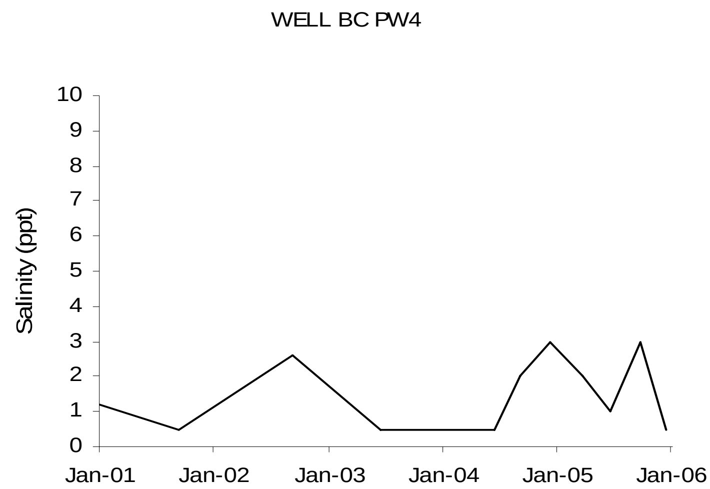
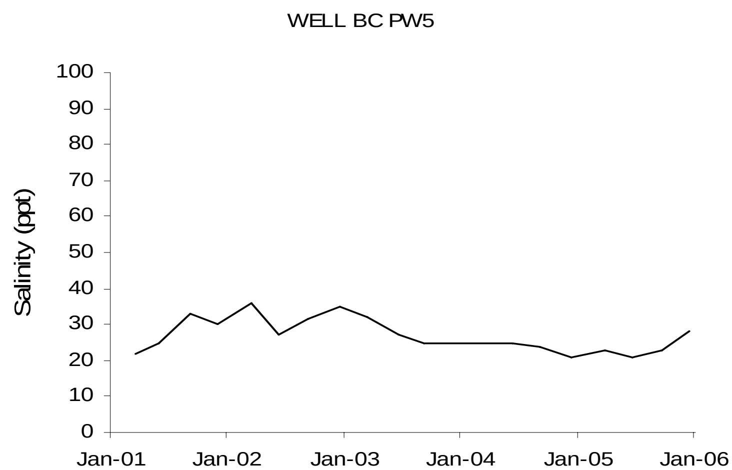


Figure 6-2. Bayou Choctaw Ground Water Monitoring Well Salinities (continued)





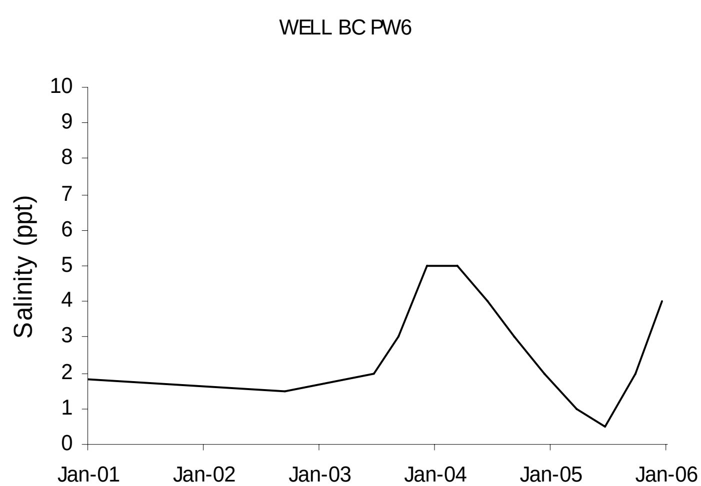


Figure 6-2. Bayou Choctaw Ground Water Monitoring Well Salinities (continued)

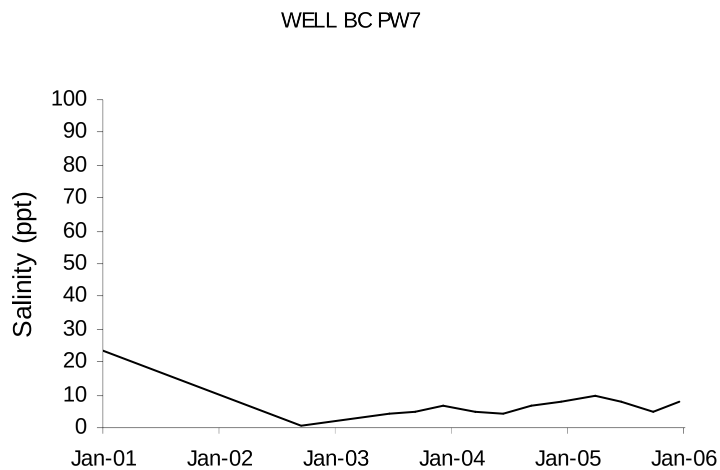


Figure 6-2. Bayou Choctaw Ground Water Monitoring Well Salinities (continued)

6.2 BIG HILL

The three major subsurface hydro geological formations in the Big Hill site vicinity are the Chicot and Evangeline aquifers and the Burkeville aquitard. The major source of fresh water is the Chicot Aquifer, which is compressed from uplift and piercement over the Big Hill salt dome. Fresh water in the upper Chicot Aquifer over the dome is limited from near the surface to a depth of -30 m (-98 ft) mean sea level. The town of Winnie, situated off the dome and to the west, uses fresh water from the upper Chicot Aquifer. Beaumont and nearby Port Arthur both draw fresh water from the lower Chicot Aquifer.

Sampling of six monitoring wells (wells BH MW1 to BH MW6) around the brine disposal pond system (Figure 6-3) began in 1987. Big Hill personnel began sampling these wells by the low-flow method in May 1995.

The interconnected brine pond system is composed of three contiguous PVC-lined ponds, of which two have a protective concrete topcoat. All three have an under drain system contained within a surrounding slurry wall system keyed to an underlying clay bed.

Salinity data collected from the six permit required wells surrounding the ponds have for the past five years indicated complete consistency and absence of effects below detection limits until 2001 for well BH MW2, which is up gradient of the points (Figure 6-4). All observed values that are below the established detection limit are evaluated as one-half the detection limit for statistical calculations. No ground water effects associated with the pond operation are evident since monitoring was begun in

1987. The salinity increase in BH MW2, up-gradient of the pond, is attributed to a previous release from buried piping. Groundwater flow in this monitored zone has been estimated at almost 4 m (12 ft) per year based on observed gradients and the soil permeability information. Translation of the arrival time of the salt front at BH MW2, from the previous release location better estimates the water velocity of 15 m (50 ft) per year. However, saltwater diffusion effects may overestimate actual water flow in this case.

This year we are presenting water level measurements contoured from the summer 2005 timeframe. Figure 6-3 presents the contours of data obtained on a date in the summer quarter for all the site wells. The gradients and flow direction remain very similar to the spring contours from 2000, two summer quarters, a winter quarter, and last year's spring quarter. In the vicinity of the brine storage pond (wells MW1 through MW6) the flow is southeasterly. The overall basic shallow flow regime mimics the ground surface and appears to be moving radially off the underlying salt dome structure. This contouring appearance cannot be corroborated due to lack of control points off the site in a northwesterly direction. As with our other sites, it is suspected that regional flow regimes are locally modified by the underlying piercements.

Well BH PW1 located further up gradient from the pond system is the only other well with a trace of measurable salinity on the site. The trace fluctuates around the method detection limit of 1 ppt and follows fairly regular pattern indicative of a pulse which may be associated with changes in rainfall, lag times, and a nearby historical brine soils impact. The levels are very low to non-detectable and shall continue to be closely monitored.

The well BH PW3 was plugged and abandoned as part of the original VWS Study.

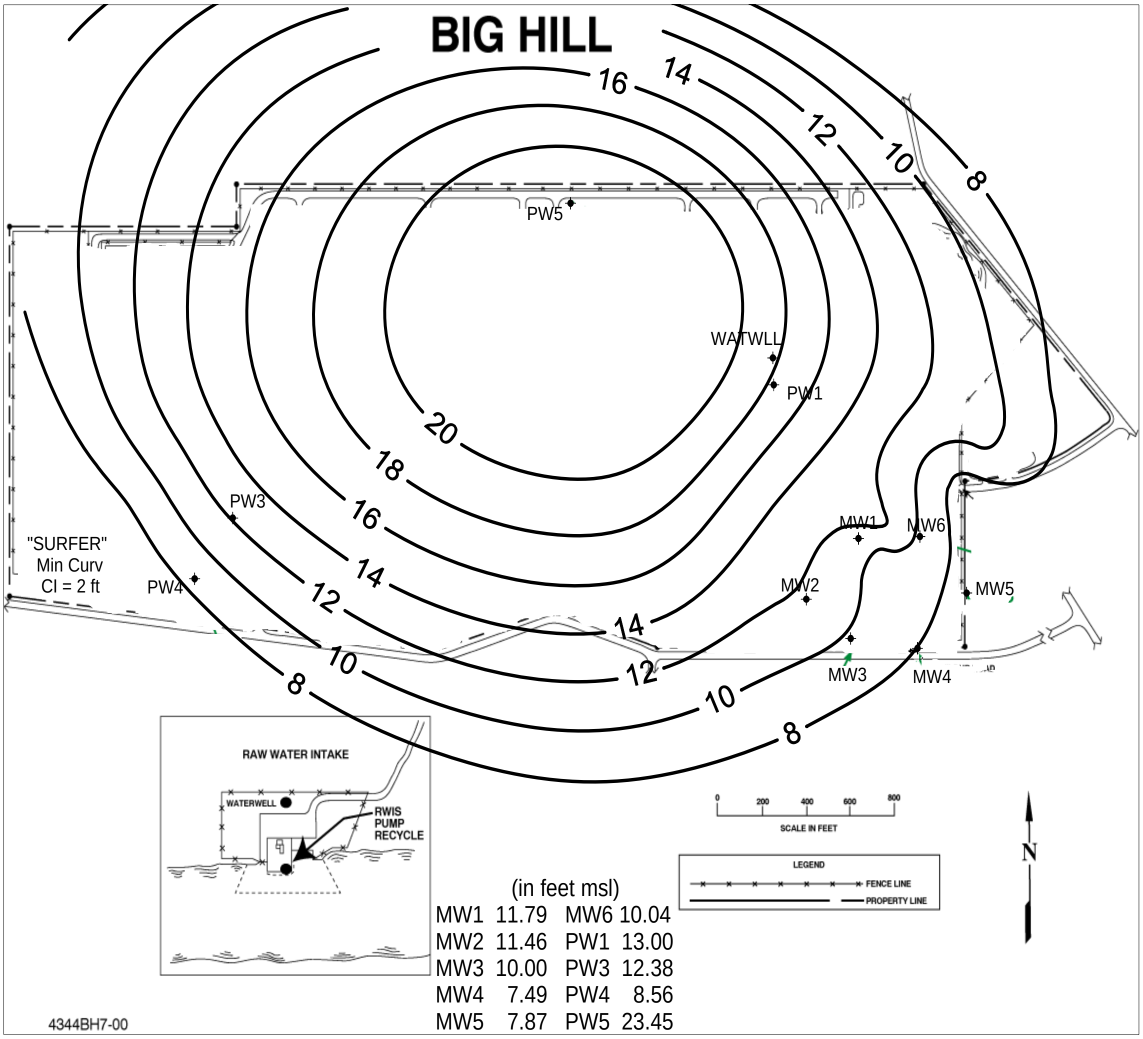


Figure 6-3 Big Hill Ground Water Monitoring Wells and Shallow Ground Water Contoured Elevations Summer 2005

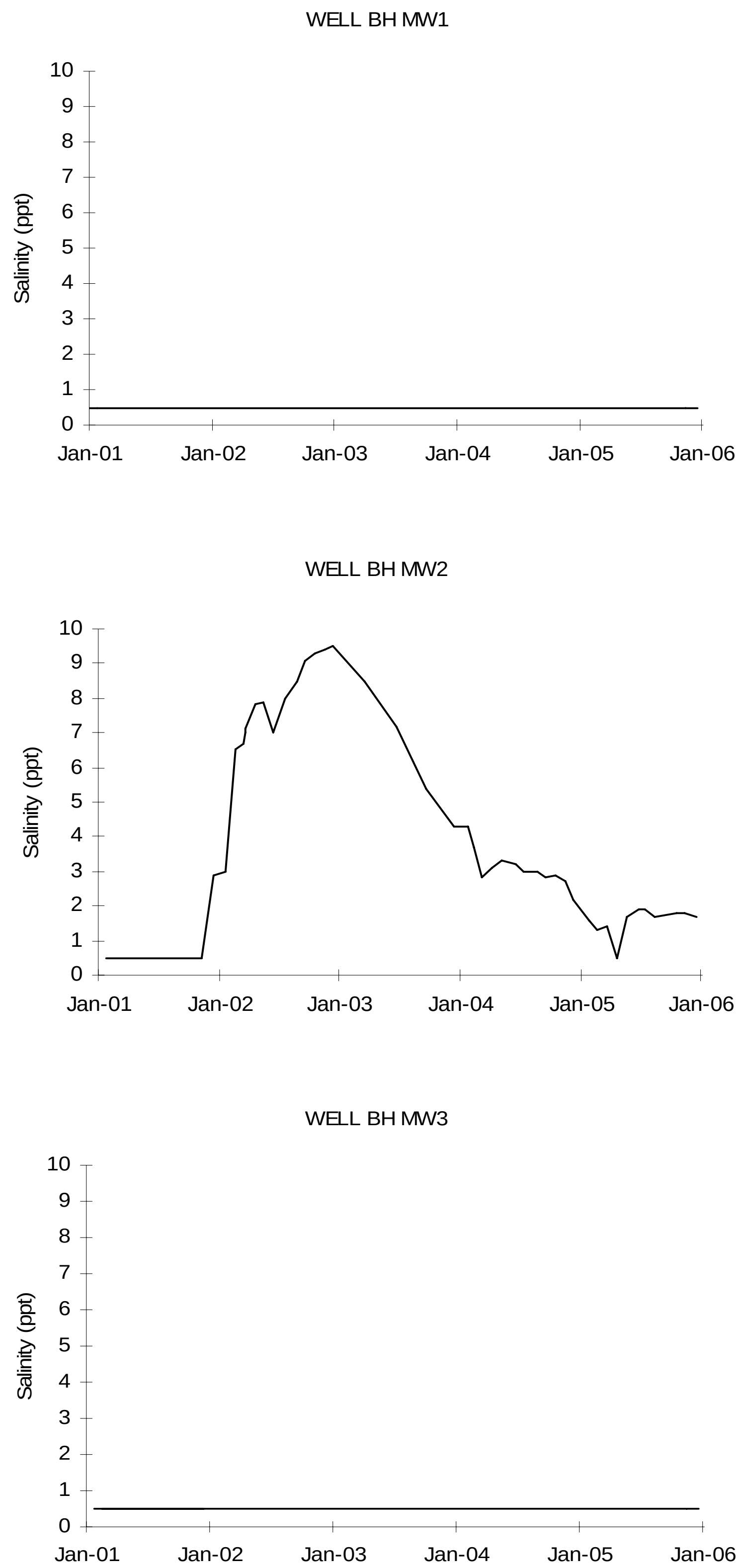


Figure 6-4. Big Hill Ground Water Monitoring Well Salinities

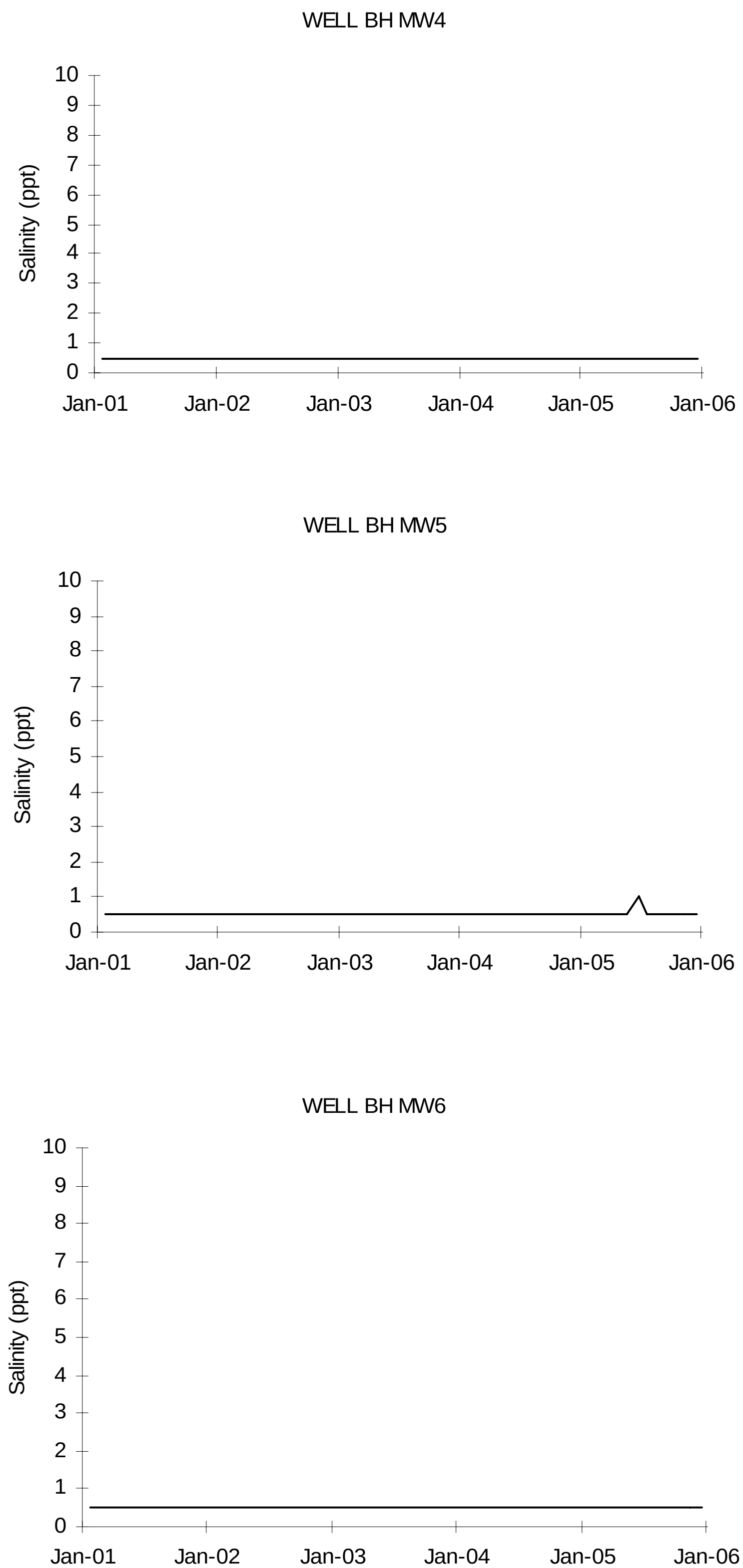


Figure 6-4. Big Hill Ground Water Monitoring Well Salinities (continued)

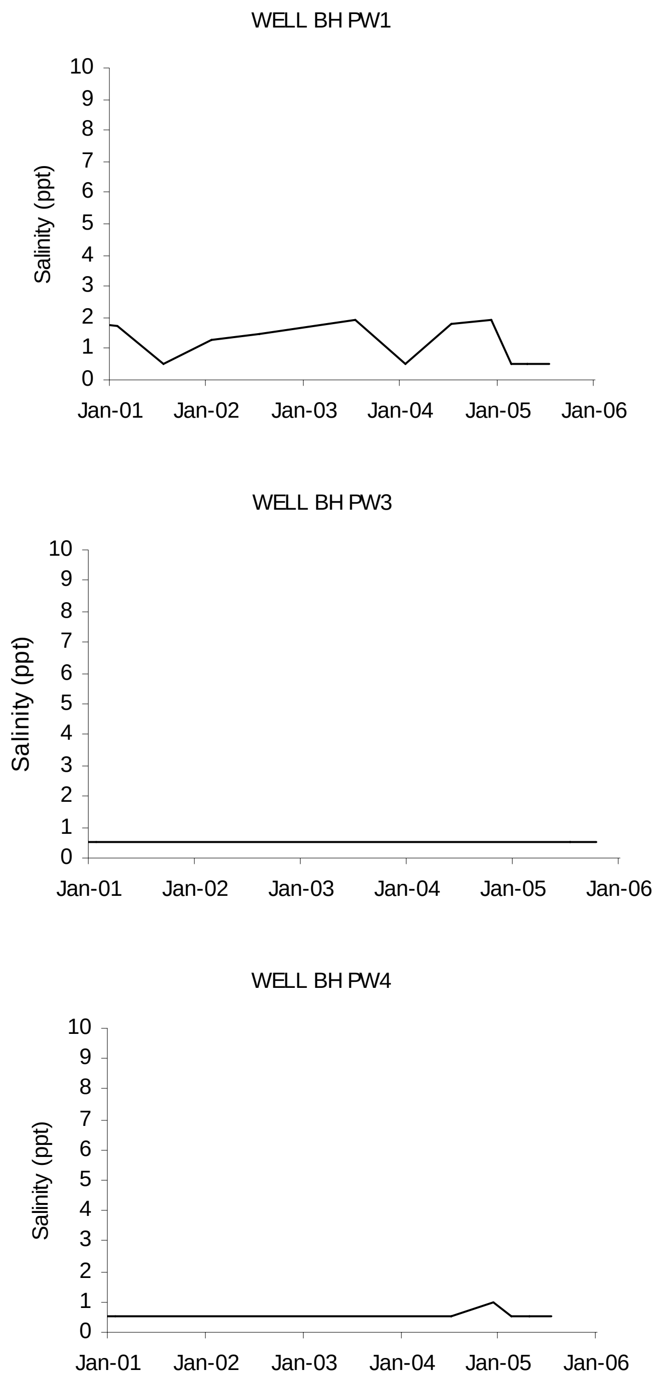


Figure 6-4. Big Hill Ground Water Monitoring Well Salinities (continued)

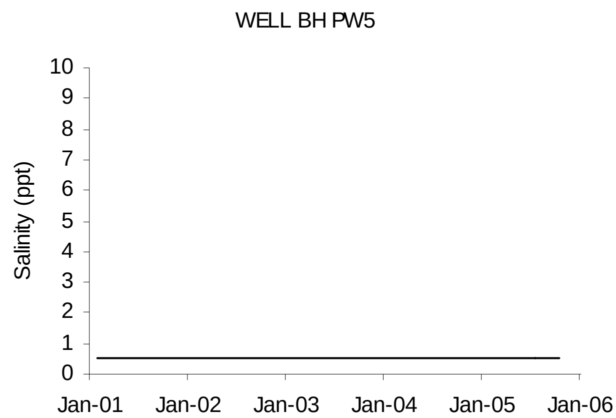


Figure 6-4. Big Hill Ground Water Monitoring Well Salinities (continued)

6.3 BRYAN MOUND

Site monitoring wells in two water bearing zones, 6 and 15 m (20 and 50 ft) bls indicate that no shallow fresh water exists over the salt dome in the uppermost inter-connected aquifer. This generalization was confirmed by the additional salinity data from the verification well study (VWS) in 1995-96. However, the Chicot and Evangeline Aquifers are fresh to slightly saline in the Bryan Mound area, and fresh water for Brazoria County is obtained from the upper portions of the Chicot up gradient of the Bryan Mound salt dome.

Fifteen monitoring wells have been drilled at Bryan Mound in four phases between 1981 and 1990 (Figure 6-5). Sampling began shortly after installation. Bryan Mound did not begin using the modified low flow sampling technique for these wells until September 1995. Wells BM BP1S, BM BP2S, and BM PZ2S have been removed from monitoring service due to casing damage. BM BP1S is discussed further below. Five additional shallow well locations and one additional deep well were installed in 1996 as part of the VWS, and all of these have been incorporated into the site's monitor well net.

The wide salinity fluctuations previously observed in the graphs occurring prior to the year 1997 have been moderating due to the implementation of a site-wide sampling methodology change. All 5-year traces this year reflect only the low-flow sampling method, producing less data variability attributed to more consistent and representative sampling of the shallow aquifers across the SPR. The resulting trending graphs should now more accurately reflect the site’s ground water conditions. With the exception of BM PW4 and BM PW2, all shallow zone wells reveal decreasing trends or freshening conditions for this 5 –year window. Three of the 6 total deep wells reveal this same general trend, with the exceptions being: BM BP1D, BM MW1D, and BM PW 2D (because of a single anomalous point this year).

Salinity trends are evident in both salt-affected and unaffected areas. Elevated ground water salinity measurements in both the deep and shallow zones near the former brine pond and pump pad area have remained relatively constant overall.

After the overall step change in salinity evident back in 1995 at the paired wells BM MW1S and BM MW1D, a decidedly consistent and similar freshening trend was noted in both zones at this location. However, commencing with this year, the deep zone well BM MW1D, is trending upwards while the shallow zone well screened above it, BM MW1S, maintains a consistent freshening trace. This may be the result of a slug of salty water passing the position in the deeper monitored zone that is not affecting the shallow zone. Both the water level measurements and now the test results support the idea that the two zones are hydraulically separate or at best very poorly connected.

High salinity measurements (>20 ppt) observed in the shallow zone near the SOC (BM MW5) and in the deep and shallow well pair near the maintenance building (BM MW2S and BM MW2D) are decreasing over the long term and are not indicative of any significant or noteworthy recent releases or events. In fact the 5-year salinity trace for BM MW2S has actually gone below the 10 ppt cut-off for most of the year. Salinity observed in the unaffected (<20 ppt) deep and shallow well pair at the northwest corner of the site (BM MW4S and BM MW4D) continue to trace decreasing five year trends below 10 ppt; with the shallow well showing a decided freshening and the underlying deep well remaining almost flat indicative of differing waters even though the water level measurements in this single pair, do not show the hydraulic separation noted with all the other deep and shallow well pairs on the site. BM MW3, also remaining under 10 ppt, shows a freshening or decreasing salinity trend over this 5-year period even with a single measured spike in the dataset occurring at the beginning of 2005.

Site ground water movement in the shallow, 6 m bls (20 ft), zone is in the northerly direction toward Blue Lake while that of the deep, 15 m bls (50 ft), zone is in the southeasterly direction toward Mud Lake. Local ground water movement is primarily affected by the domal upthrusting. The newer, more peripheral wells indicate that the shallower zone is influenced more by the topography and appears to be flowing radially (in all directions) off the dome (see Figure 6-5). The flow direction in the deeper zone results from a NW-SE trending recharge zone causing flow to move in a northeasterly manner over half the site and in a southwesterly manner for the remaining half (see Figure 6-6). The water level data for 2005 were contoured using the new re-leveled measuring points from 2003. and again this year the re-leveled data did not produce any dramatic changes in flow direction interpretation but revealed gradients that appear to have steepened on portions of the site near the edges of the dome. Most notably the area of generalized mounding in the shallow zone near well BM PZ1S is now completely smoothed and regular revealing no discernable anomalies or tendencies versus the previous years. These shallow zone conditions will be watched for subtle changes, as a return to more normal rainfall amounts and patterns, could also produce the same effect through localized recharge.

The water level contouring of the deeper zone wells is now tending to show a response consistent with lack of local recharge with time as the gradients are flattening, especially in the center of the site, as the contour lines expand outward towards the edge of the dome.

Both of these aquifers exhibit a very low average linear velocity ranging from an estimated 1.5 m/yr (5 ft/yr) in the shallow zone to 3 m/yr (10 ft/yr) in the deeper zone. This slow movement is due to the combined effects of the clay content of the water bearing strata and very low hydraulic gradients which range from 0.0006 m/m to 0.001 m/m (0.002 ft/ft to 0.004 ft/ft). This low average velocity characteristic reduces the risk of contaminating any fresh and potable water bearing zones known to exist off the flanks of the subsurface dome.

When contoured two major areas emerge where ground water salinity exceeds ambient conditions (>20 ppt) for the Bryan Mound site. The first area stretches from the former brine pond eastward to the brine pump pads and to the vicinity of an older brine pond demolished by DOE in 1989, and then southward towards the center of the site and below the maintenance building already discussed. Operations pre-dating DOE ownership included brine retention in two separate unlined elongated abandoned ponds reclaimed (filled) by DOE in this same area. The second and considerably smaller area lies southeast of the security operations center (SOC) adjacent to a closed anhydrite confinement area.

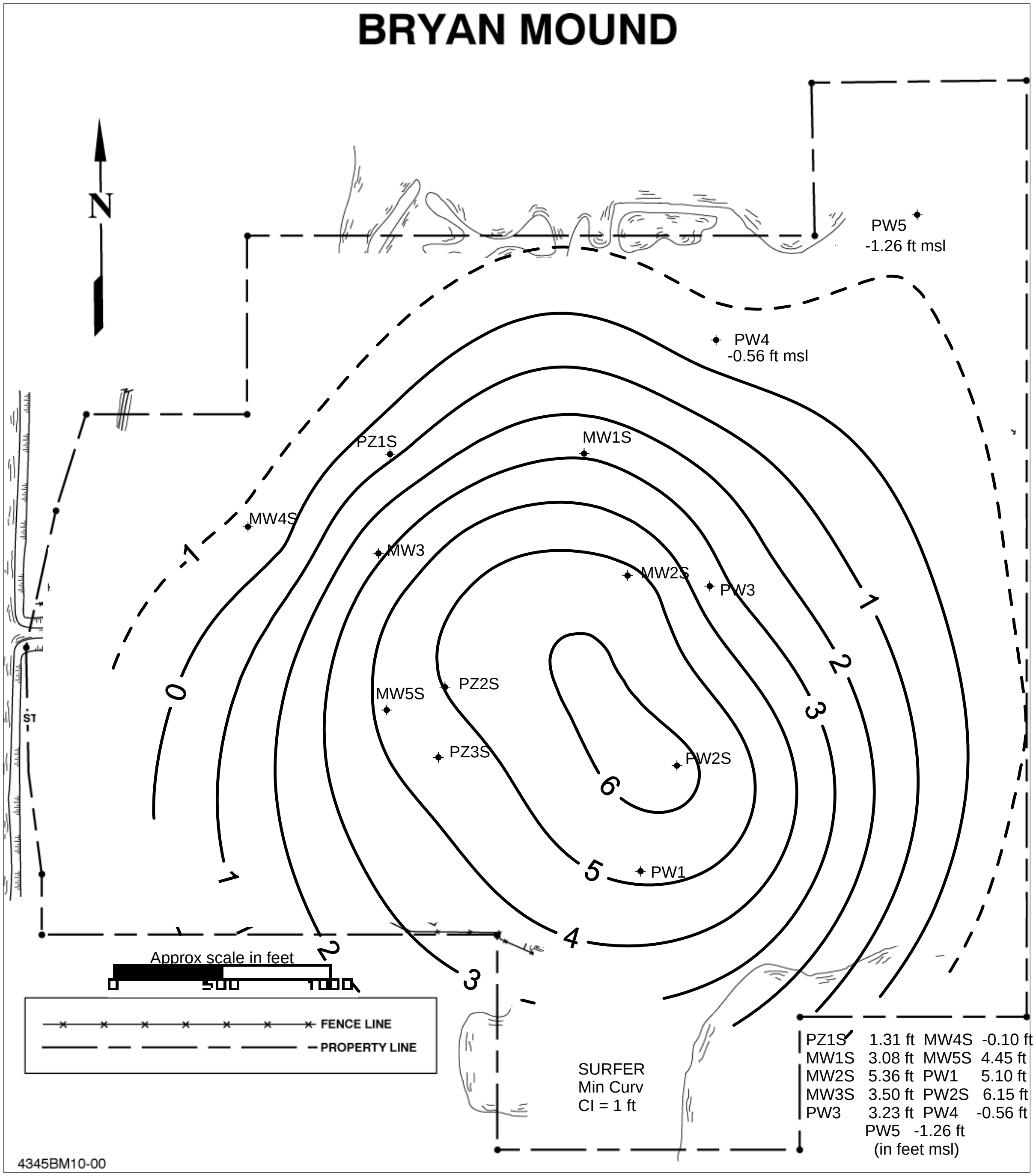


Figure 6-5. Bryan Mound Ground Water Monitoring Wells And Shallow Ground Water Zone Contoured Elevations Summer 2005

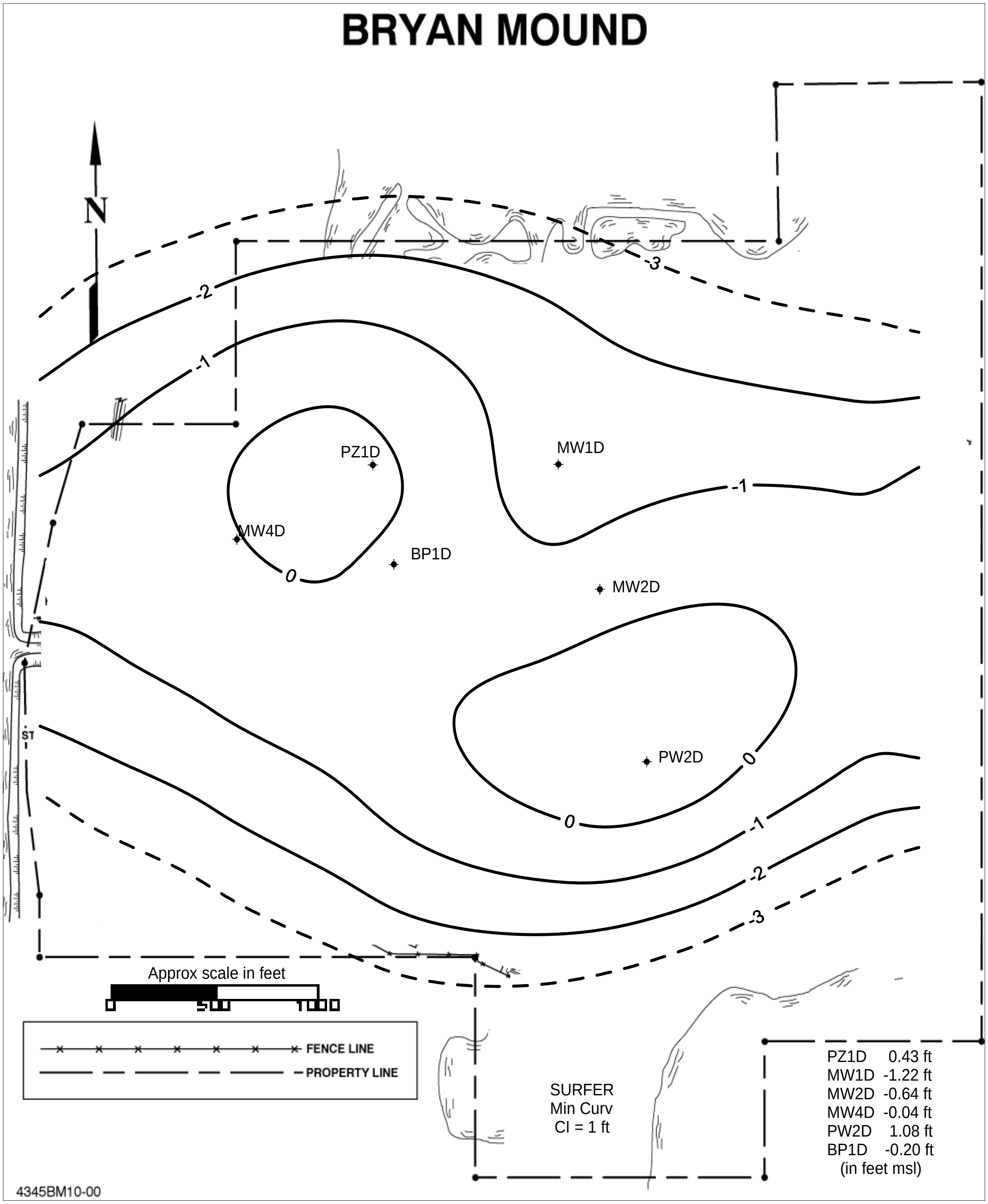
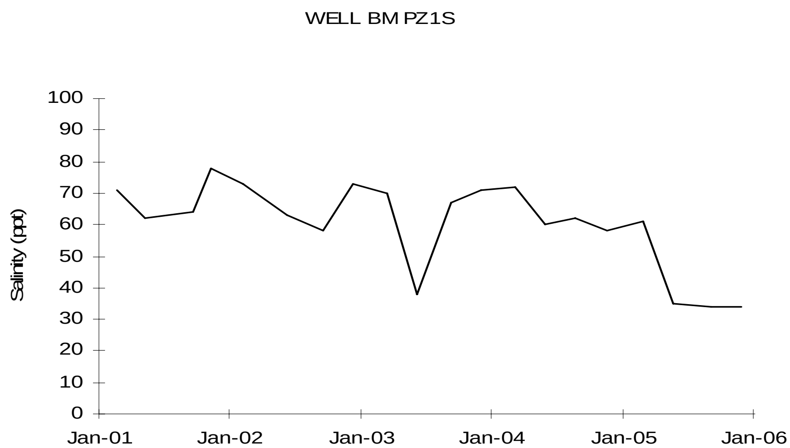
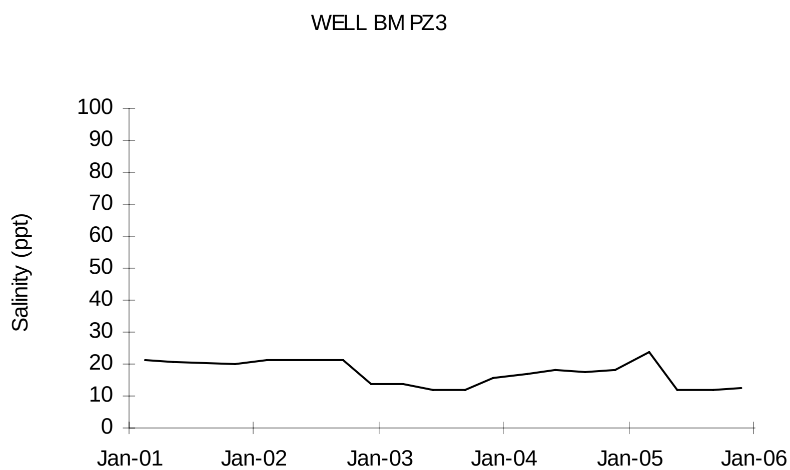


Figure 6-6. Bryan Mound Deep Ground Water Zone Contoured Elevations
Summer 2005





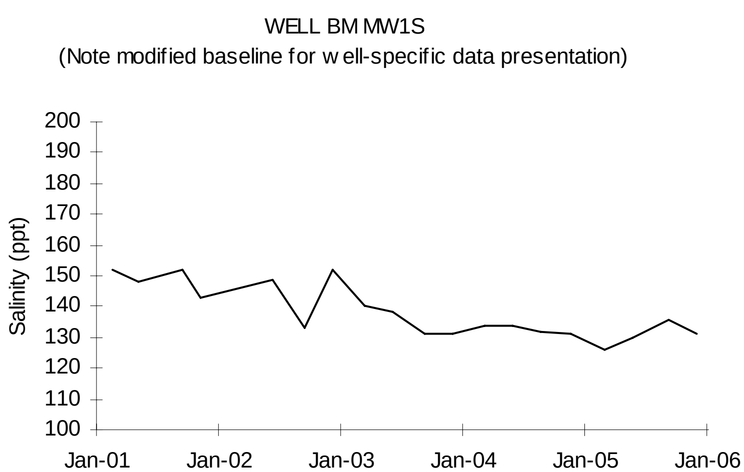


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities

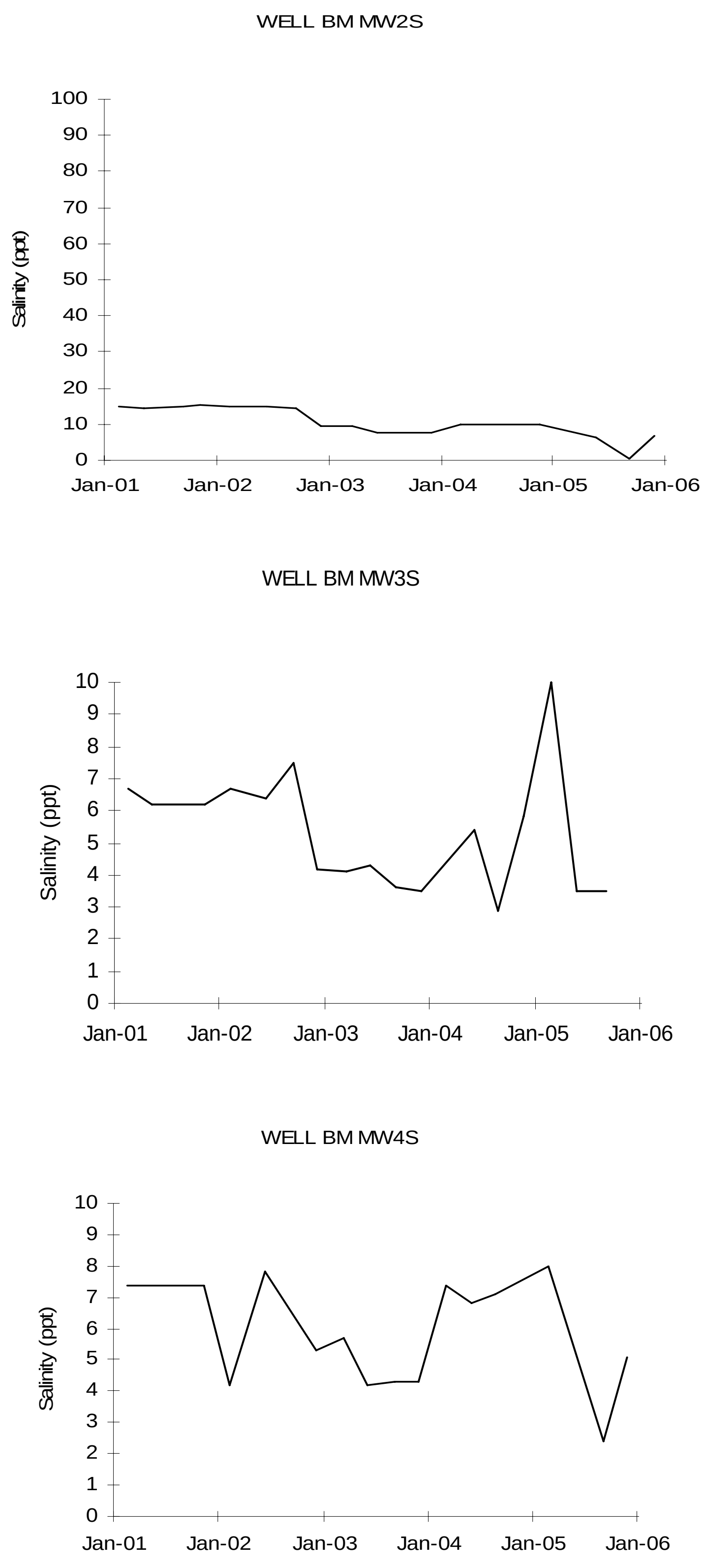
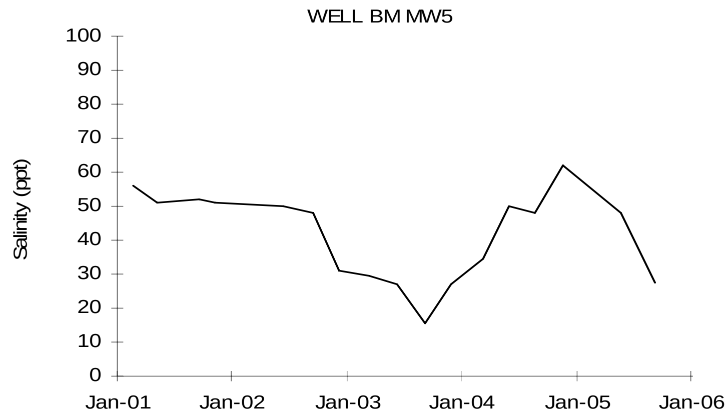
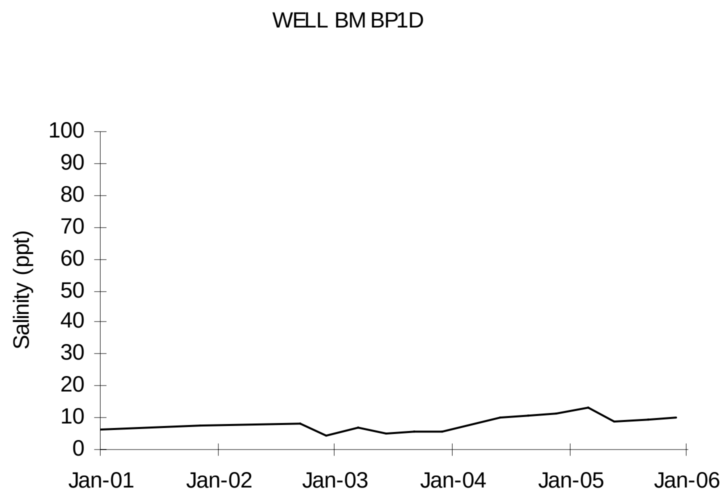


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities (continued)





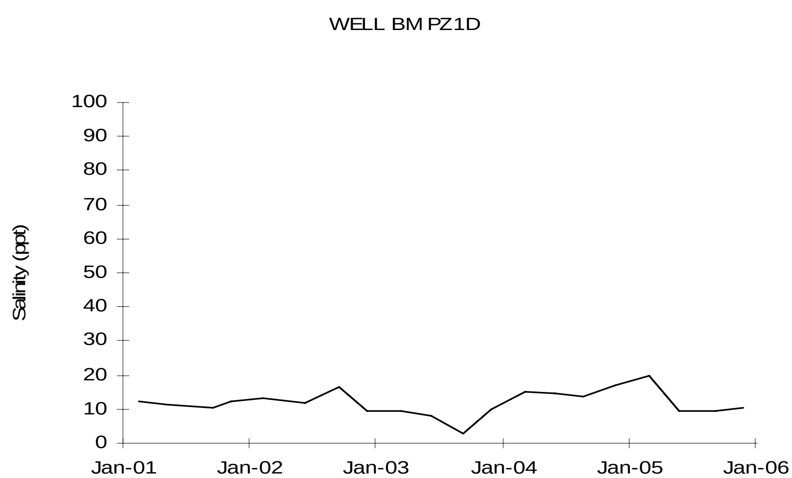
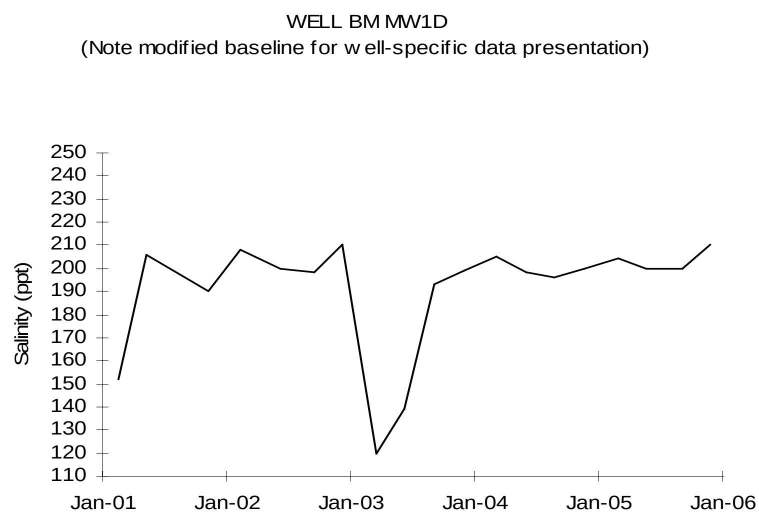
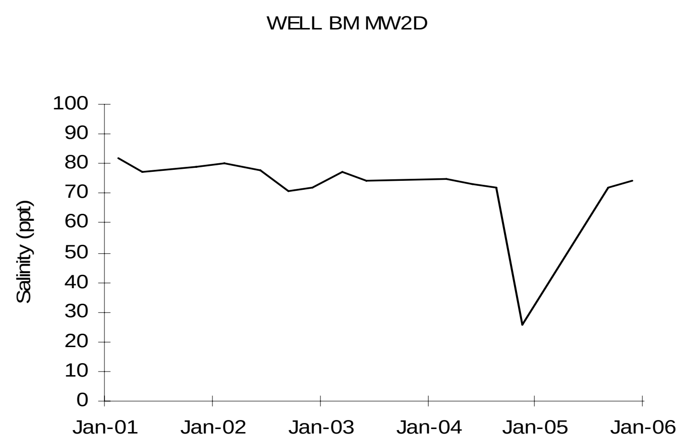


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities (continued)





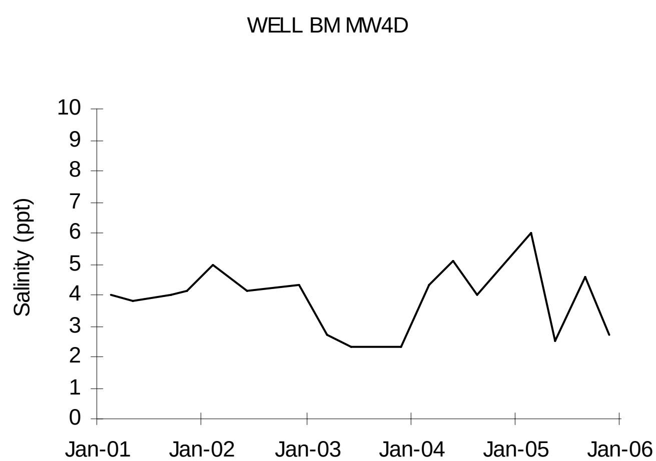
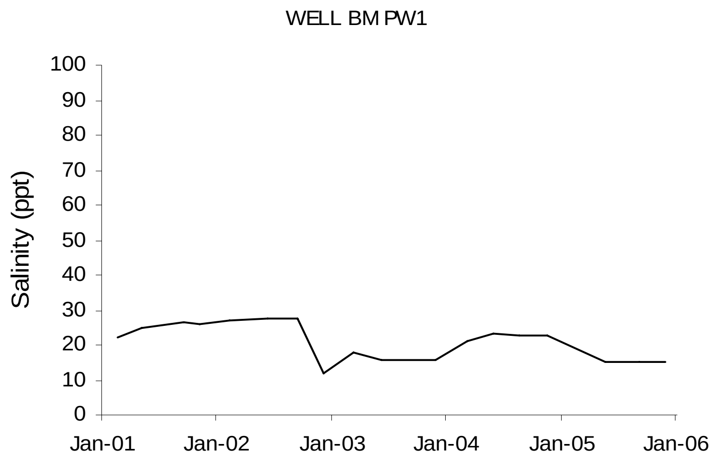
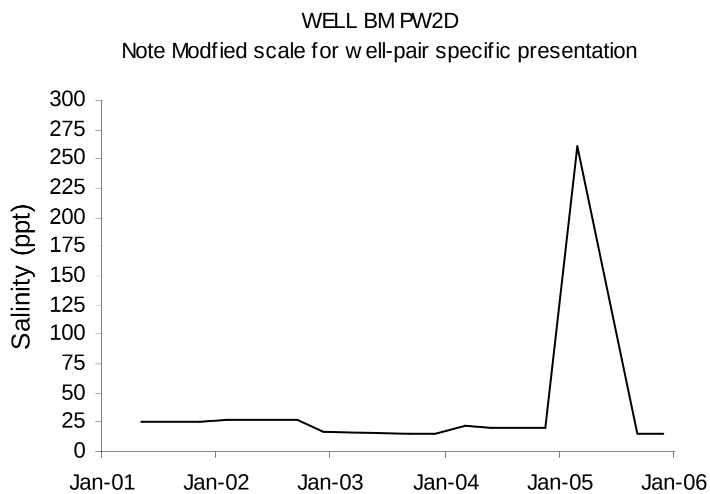


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities (continued)





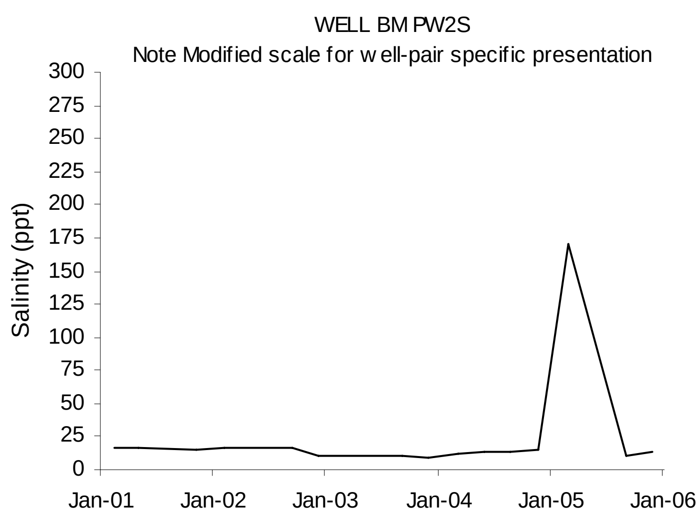


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities (continued)

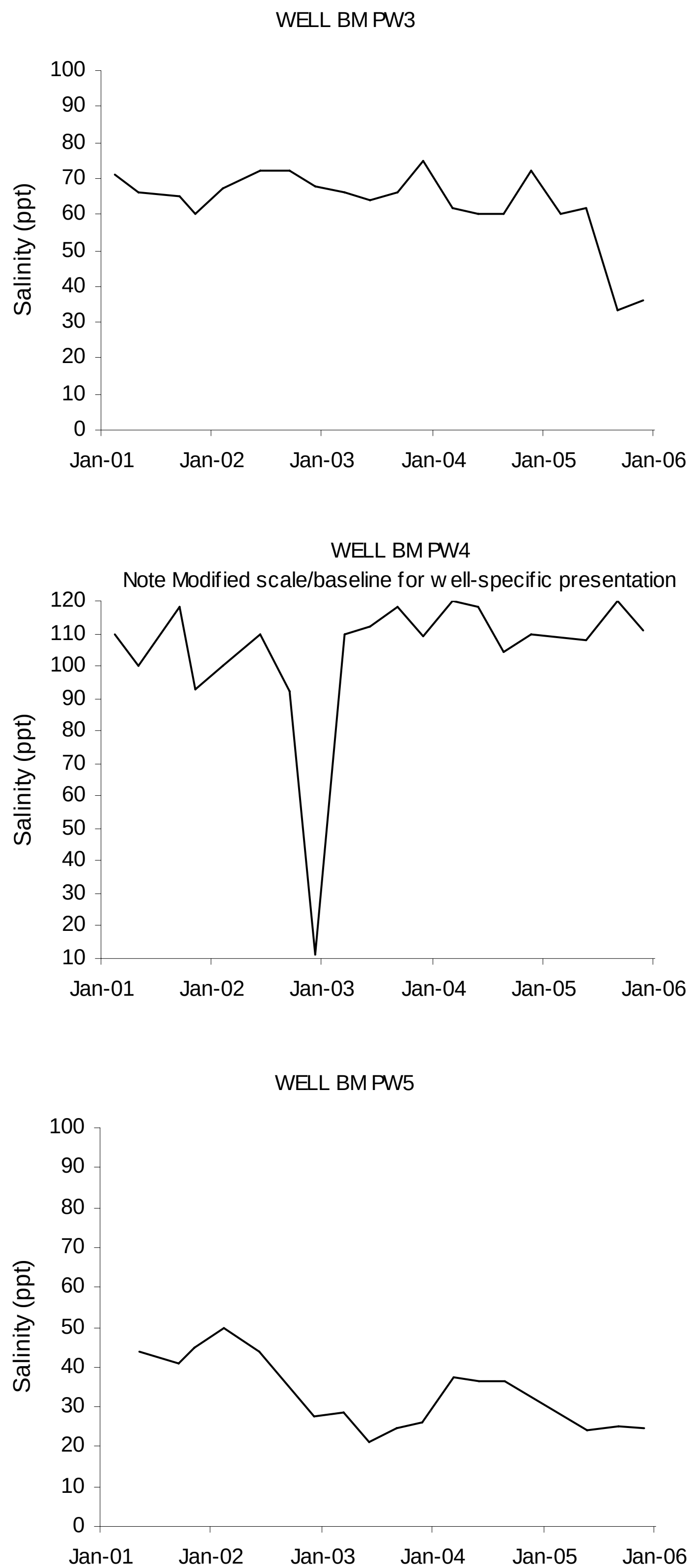


Figure 6-7. Bryan Mound Ground Water Monitoring Well Salinities (continued)

The trending lines for the wells at each of these locations reveal a downward slope of freshening conditions (see graphs for BM MW1S; BM MW2S; BM MW2D;BM MW3S; BM MW4S, and BM MW 5S. The notable exception to this group is well BM MW1D, which is showing an increasing trend with time in this year's 5-year charting, and which is at a position down gradient of previously mentioned unlined ponds. Elevated salinity observed at shallow monitor wells since their installation, BM PZ1S, BM MW1S, and former BM BP1S, has been speculated to be associated with SPR brine storage pond activity. The large brine pond with a Hypalon® (chlorosulfonated polyethylene) membrane was originally constructed in 1978. The pond was subsequently renovated and enlarged (raised levee for capacity) with installation of a new Hypalon® liner and a concrete weight coat in 1982. The Bryan Mound brine pond was removed from brine storage service in September 1998. Removal of solids and closure construction activities concluded in the early spring of 1999. Because of the very slow ground water movement rates and the estimated long lag-time needed for vertical migration, the salinity measurements observed in the pond area and especially those to the northeast and east could be the result of seepage from before 1982 renovations of the pond, or from operations occurring before the SPR. Salinity of deep complements to wells BM PZ1S and former BM BP1S (BM PZ1D and BM BP1D) are much lower and considered ambient (<20 ppt) for the site. They indicate no contamination of the deep zone around the immediate vicinity of the former pond and no apparent direct communication with the shallow zone in this area. The shallow zone wells BM MW1S and BM PZ1S reveal downward or freshening trends now with the consistent sampling regimen and the well directly down gradient of the former SPR brine pond, shallow zone well BM PZ1S reveals a steadily freshening trend for the current 5-year window. Well BM BP1D, located south of the former SPR brine pond continues to trend slowly upward, but overall remaining below 20 ppt.

Data from the VWS completed in the summer of 1996 indicate that the primary location of shallow zone salinity impact is in the area of well BM MW1S, which is mirrored by elevated salinity in the underlying deep zone around BM MW1D. This is the location of former below grade unlined brine retention ponds from pre-SPR operations. The high salinity of the deep well may also indicate limited hydraulic communication of the two ground water zones in or just up gradient of that location. It is also possible that complete saturation and permeation of the clayey separation layer between the two zones by a dense and strongly ionic salt solution has occurred in a very limited area, as the water levels indicate hydraulic separation (4.2 feet of head difference) between the two zones at these two closely spaced wells.

The former SPR brine pond was closed in 1999. The final annual structural inspection of the brine pond, made in November 1998, concluded that no obvious structural compromises of the pond's integrity had occurred. From the time when the pond had all its contained liquids and solids removed late in 1998 until the close of CY 2005, the shallow ground water has not moved more than about 35 feet laterally. Given the anticipated long lag-time for vertical migration and then the lateral distance required to be covered to the nearest wells, it may be some time for any potential post-closure salinity changes to become evident in the monitoring.

Southeast of the SOC and adjacent to an anhydrite disposal area used during early construction is a second area where elevated salinity ground water is found. The limited area of contamination is intercepted in the shallow zone by well BM MW5S and perhaps BM

PZ3S and has been relatively consistent over the history of long term monitoring. The VWS study indicated these wells may be affected more by diffusion than by flow gradient, especially at well BM PZ3S which is somewhat on the up-flow side of the anhydrite disposal pit. The 5-year trending charts for both of these wells indicate a general freshening with time continuing into 2005 although in the short-term (CY2004) there is an "up-tick" evident with the data from BM MW5 which in CY2005 reveals an equally substantial downward swing which may be related to the return to more normal (post drought) rainfall conditions.

A suspect brine contamination source south of the site's maintenance building may be producing another area of elevated salinity. A definite source has not been identified or associated with any known historical SPR operations or incidents, and therefore most likely predating SPR activity. Salinity measurements exceeding ambient levels (> 20ppt) have been observed historically in both zones at wells BM MW2S and BM MW2D, with the shallow well BM MW2S remaining below 20 ppt from 2000 through 2005 with continuing improving quality. This area is masked when contoured, falling under the general "blanket" of the effects associated with the pre-SPR brining operations located in the north central portion of the site already described. This area may therefore be considered part and parcel of that historic saltwater release; being affected more by diffusion and dispersion rather than direct flow.

Brine contamination is not evident at the northwest corner of the site. Shallow zone monitor wells BM MW3S and BM MW4S near the southwest corner and west of the former brine pond, respectively, have historically remained relatively stable in the unaffected 5 to 10 ppt range. The ground water salinity at the northwest corner of the site is consistent or better than the salinity observed in Blue Lake, the adjoining surface water feature. These two wells are also down gradient of the anhydrite disposal area and do not reveal any impacts at this time. During CY2005 two anomalous spikes in salinity were observed at the paired deep and shallow wells BM PW2S and BM PW2D. These wells are located near the center of the site and are both therefore situated atop apparent site recharge areas based on the water level contouring. Not being down gradient of any known or potential salinity source and because these spikes were similarly noted and also found to be ephemeral (as normal levels were measured in subsequent samplings) they will be closely monitored until some patterns or trends emerge. This observation reinforces the interpretation that current activities are not a contributing factor to the salinity levels observed at this site. Returning rainfall may also be recharging the wells locally but any surface soil sources would percolate downward. And most wells at this site are showing marked improvements with increasing regular rainfall.

6.4 SAINT JAMES

The Chicot Aquifer is the principal regional aquifer at St. James. The upper strata of the Chicot Aquifer are in direct hydrologic contact with the Mississippi River. Much of the ground water contained in this aquifer is slightly brackish. In the St. James area only the uppermost units contain fresh water.

St. James was leased to Shell Pipeline on January 31, 1997. No permanent ground water monitoring wells have been installed at the St. James site due to the absence of brine and chronic crude oil spills. Underground diesel and gasoline tanks were removed in 1995. As a result of due diligence studies undertaken prior to property transfer to Shell Pipeline, crude oil contamination identified on the shallowest perched water table at two limited areas at St. James. Notification was made to LDEQ in January 1997.

Additional investigations and actions have been implemented including removal of free product and excavation of contaminated soil leading to approval of "no further action needed" by the state. Due to limited access and congested below and above ground piping in the BPS area a combination of hydro-excavation and insitu contaminant attenuation activities have been undertaken.

Remediation efforts toward clean closure through bioremediation under the Risk Evaluation/Corrective Action Program (RECAP) are ongoing. The SPR is proceeding under RECAP Management Option 1, with LDEQ recommended additional steps to be taken to assist in the remediation of this site.

1. Continue reduction of constituent (crude oil) concentration, toxicity, mobility, mass and volume to acceptable levels by monitored natural attenuation per section 2.12 (Monitored Natural Attenuation) of the RECAP.
2. Continue oil removal (if present) from the three monitoring wells at a frequency of once every six months until remediation goals are met.
3. Conduct total petroleum hydrocarbon (TPH) analyses on soil samples to be taken from the contaminated area once per year until TPH concentrations comply with the RECAP MO-1 limit.

4. Conduct gas chromatography (GC) analyses on oil removed from the three monitoring wells for the presence of light-end hydrocarbons to confirm the presence/absence of fresh oil once per year until TPH concentrations comply with the RECAP MO-1 limit.
5. Submit an annual report delineating oil/water volumes removed, analytical data, and applicable site activities to the LDEQ.

As of 2005, two data sets for groundwater and soil indicated Management Option 1 closure criteria have been achieved. A third data set will be collected in 2006, consistent with LDEQ requirements for 3 consecutive clean data sets. If this data proves consistent with the previous data sets the SPR will prepare the necessary documentation to request LDEQ concurrence with clean closure of the St. James remediation action.

6.5 WEEKS ISLAND

The Chicot formation is the principal aquifer in the Weeks Island area. The aquifer's potentiometric surface is generally at or just below sea level upon the domal structure of Weeks Island and is found to slope slightly west southwesterly producing a very mild but noticeable gradient towards Vermilion and Weeks Bays in the southwest quadrant where the majority of the island is occupied. The fresh water bearing sand layers that occur above the salt provide usable water for the local area.

The Weeks Island Decommissioning Plan contained a proposed a five-year post-closure ground water monitoring phase that concluded in November 2004. The final quarterly Long-Term Monitoring Report was provided to the LDNR in February 2005, and a Final Summary Report of all aspects of the monitoring at Weeks Island was provided to the Office of Conservation in June for evaluation in petition of fulfillment of all the original approved site monitoring. In October 2005, LDNR accepted the petition and the cessation of all monitoring, including ground water and subsidence, was approved.

6.6 WEST HACKBERRY

The Chicot Aquifer, which occurs closest to the surface in the Hackberry area, contains predominantly fresh water with salinity increasing with depth and with proximity to the Gulf of Mexico. The majority of the ground water pumping from the Chicot Aquifer takes place in the Lake Charles area. Pumping is so great that a cone of depression has been created which has reversed the flow direction to the north. The fresh/saline water interface is approximately 213 m (700 ft) bls off the sides of the dome and more shallow directly over the dome where our site is situated. Areally limited zones found affected and monitored at the West Hackberry site are much nearer the ground surface, with a shallow zone at roughly 6 m (20 ft) bls and a deeper zone at roughly 15 m (50 ft) bls. Details provided by the VWS in 1996 indicate that the two zones contrast sharply in permeability, and as a result, their estimated linear velocity measurements are quite different. The range of flow rates estimated for the shallow zone is from 50 to 200 feet of movement per year, which results from both variable permeability values and varying gradients across the site. The deep zone exhibits a generalized flow rate estimate of only 7.5 feet per year, which is largely due to the more clayey nature of the sands conveying these waters and the lower gradients evident within the site’s limited well net.

Situated directly atop the salt dome and given the long industrialized history of the site and the immediate area, a 10 ppt cut-off for salinity is used in comparisons for determining affected and unaffected waters as historical ambient conditions have been found highly variable across the site.

The 1991 Contamination Assessment Report and Remedial Alternatives Analysis identified the former brine pond as a source of ground water contamination. The decommissioned brine pond was one of five adjoining ponds comprising a pond system and solids management system that handled brine and anhydrite solids pumped from the storage caverns. Early in its history, cracks in the liner's concrete weight-coat walls and floor were grouted to stop leakage. Ground water recovery around the pond was also increased at this time, which was to be maintained until a brine tank system could be constructed as a replacement. The state approved brine pond-decommissioning plan was concluded in November 1999.

Eleven monitoring wells and 15 former recovery wells (Figure 6-8) have been installed on the West Hackberry site in five phases. All were used to either monitor or control brine contamination movement beneath the brine pond system. Salinity data gathered over the past five years at all wells is depicted in Figure 6-10. Four of the seven wells originally installed for VWS were retained for additional water level measurement around the periphery of the main site bringing the site total up to thirty. Salinity data are depicted in the five-year trending graphs for all of these wells, however, certain wells are tested for salinity only once per year per our 2002 monitoring proposal for resumption of site-wide monitoring approved by LDNR in early 2004.

West Hackberry personnel began using the low flow technique for sampling all non-pumping wells in December 1995. Water level measurements from both zones for the summer quarter timeframe of 2005 have been reduced to elevations, contoured, and are presented as

Figures 6-8 and 6-9, Shallow Zone and Deep Zone, respectively. The effects of the long-term pumping have dissipated in both zones over time and the current data appear to reflect unaffected flow regimes. The contour map of the water levels in the underlying deep zone reveals a rather flat pressure derived gradient within the semi-confined water bearing zone. The low permeability of the deeper zone routinely produced very pronounced draw down levels at the former pumping wells, which in turn produced an unusually deep and pronounced cone of depression as an artifact of the contouring. The slow recharge to this lower permeability zone has been monitored closely for a number of years. The pressure gradient evident is very low and continues to maintain very slow travel times and indecisive (ephemeral) travel paths with no hard and fast direction beneath the site on this portion of the dome. The general appearance is that of a recovered confined water bearing zone, receiving some recharge potential in the vicinity of wells WH P1D, WH P4D, and WH P2D.

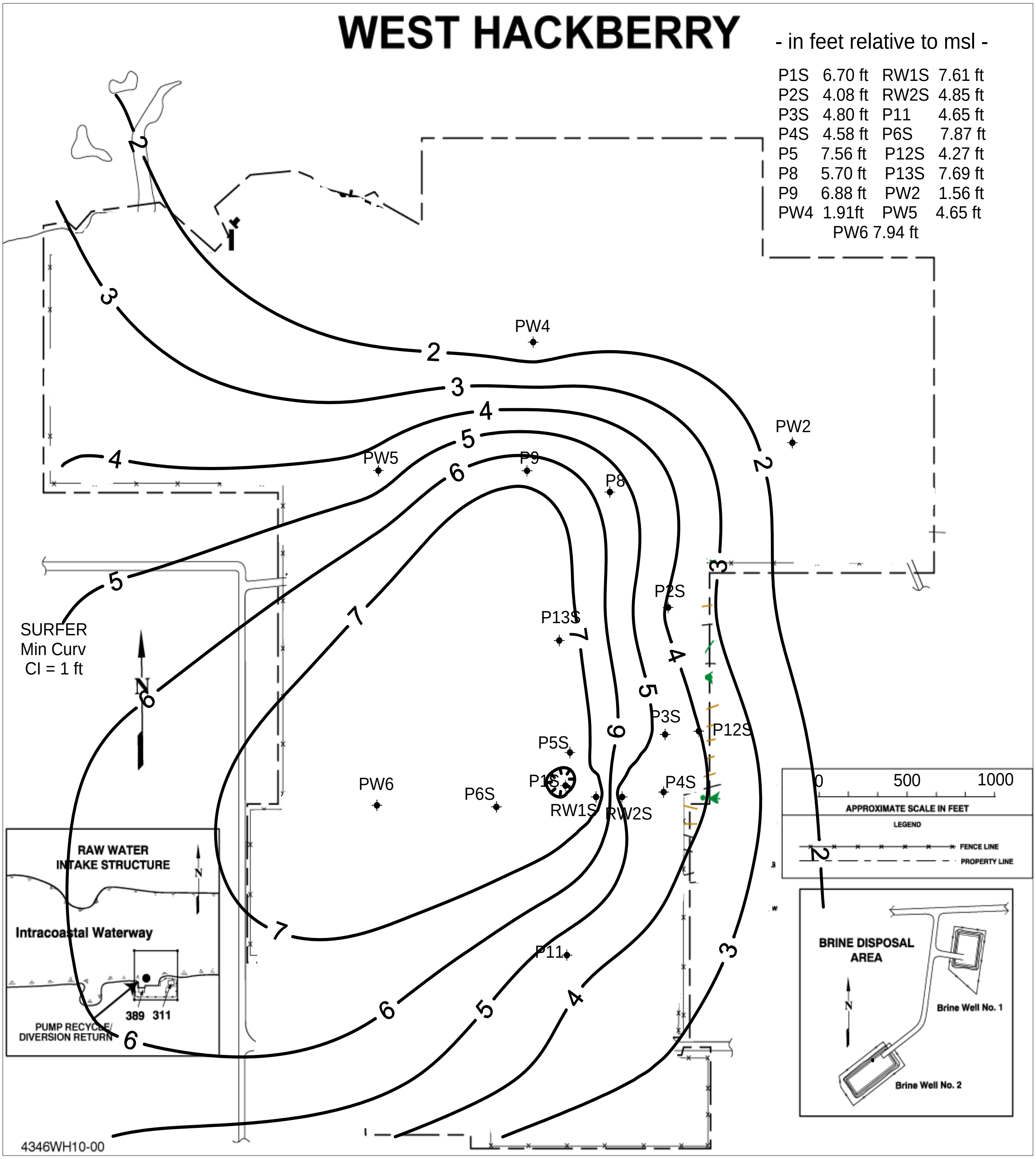


Figure 6-8. West Hackberry Ground Water Monitoring Wells and Shallow Ground Water Zone Contoured Elevations Summer 2005

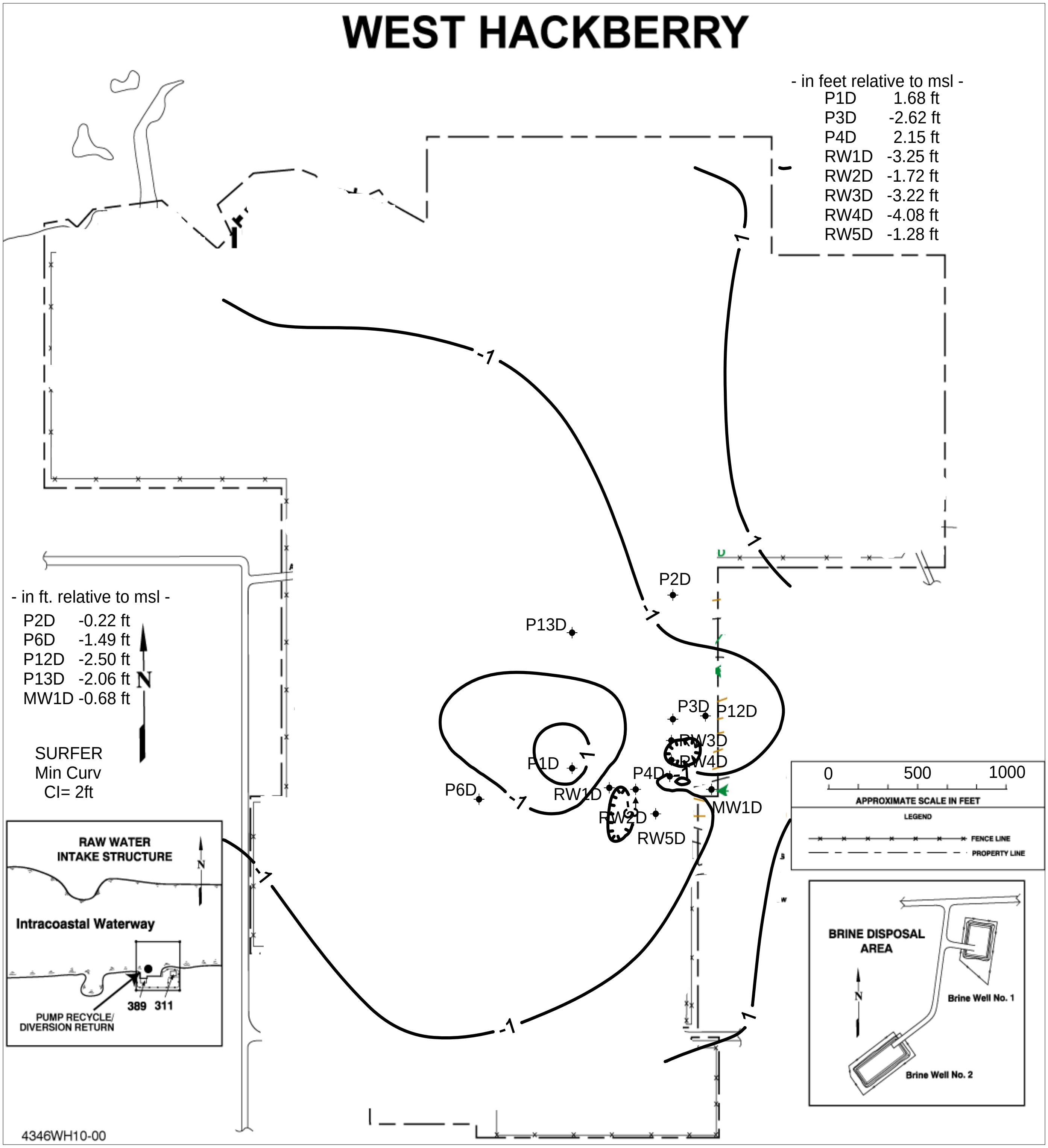
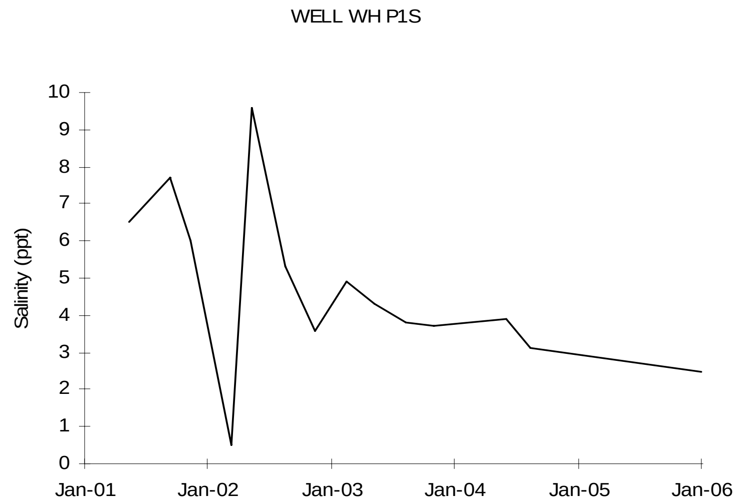
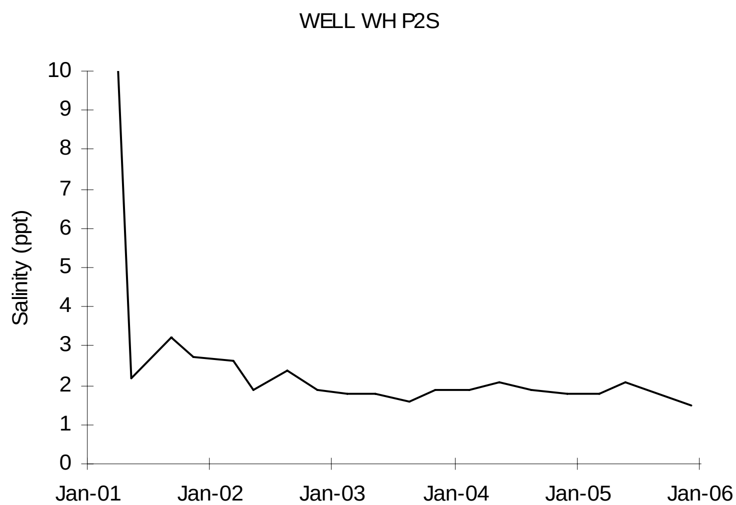


Figure 6-9. West Hackberry Ground Water Monitoring Wells and Deep Ground Water Zone Contoured Elevations Summer 2005





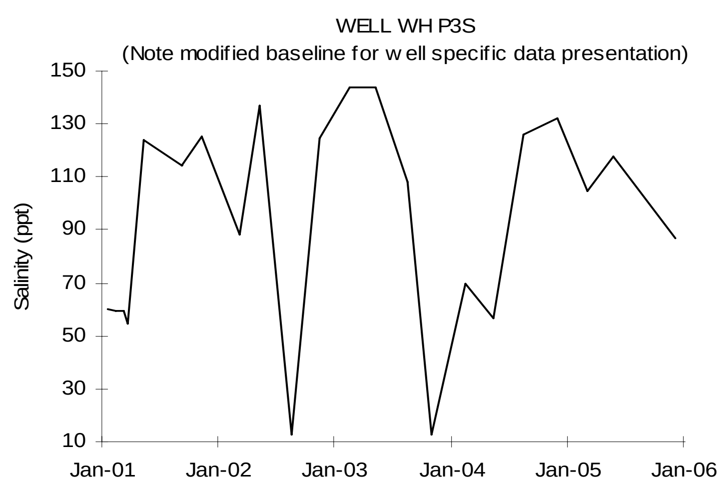
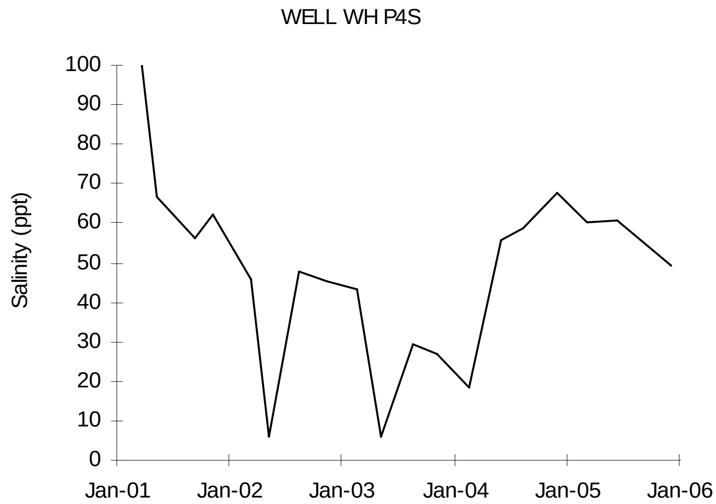
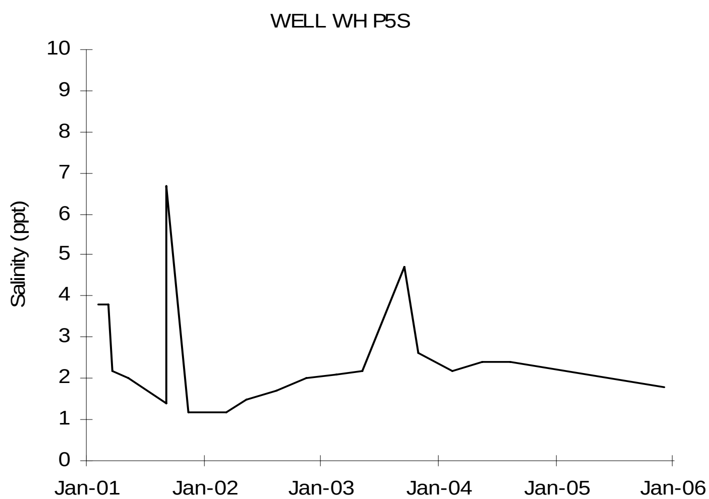


Figure 6-10. West Hackberry Ground Water Monitoring Well Salinities





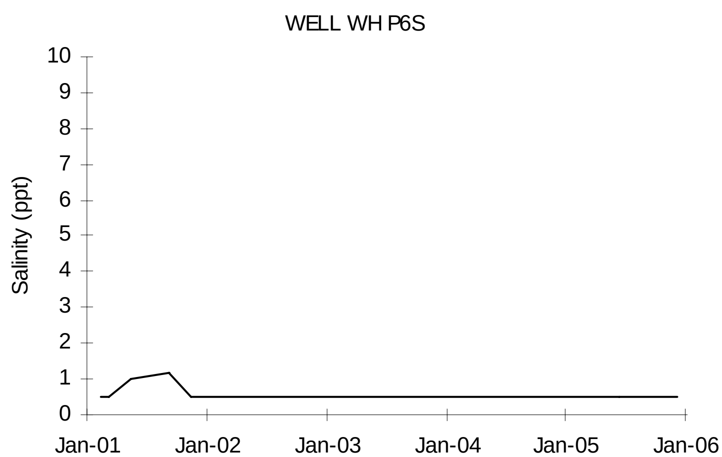
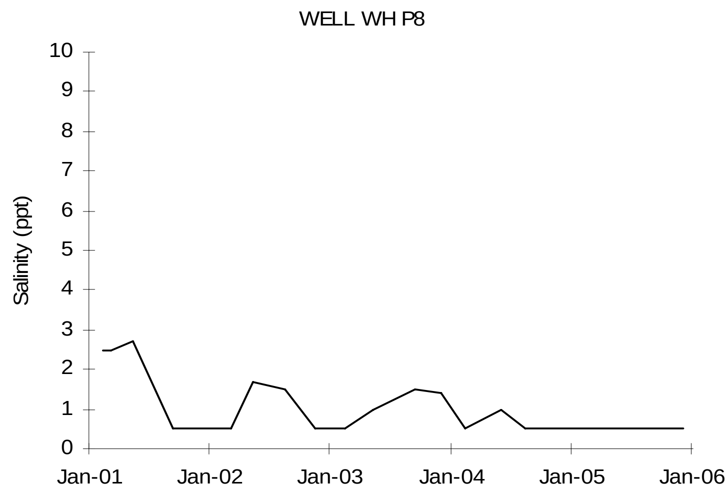
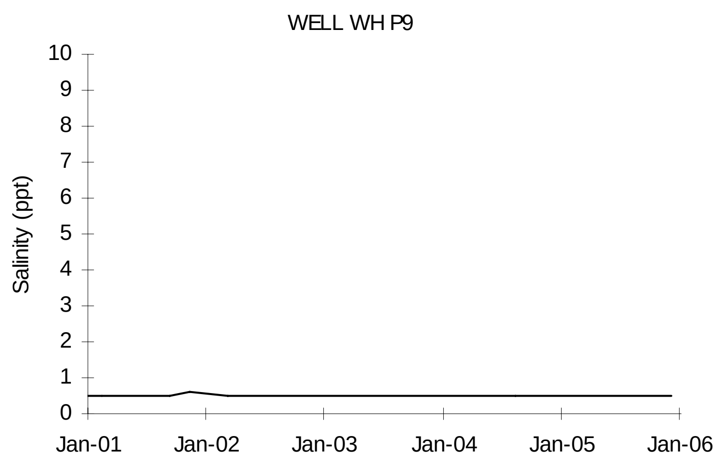


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)





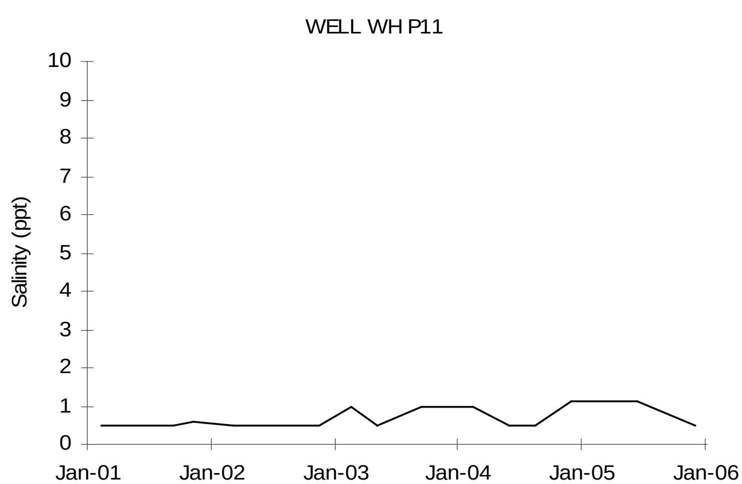
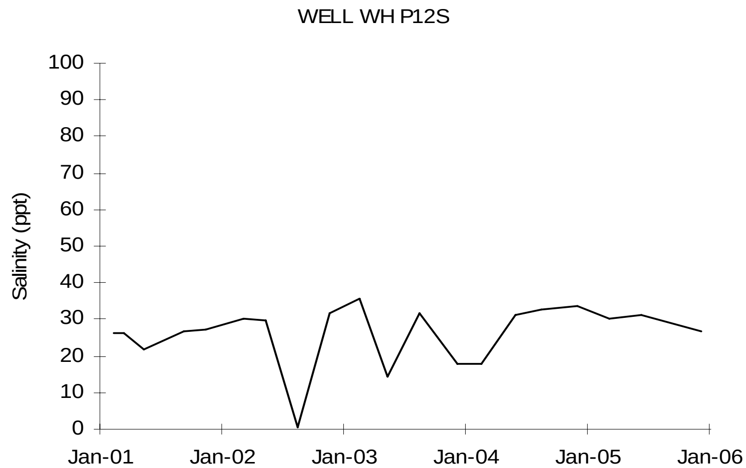
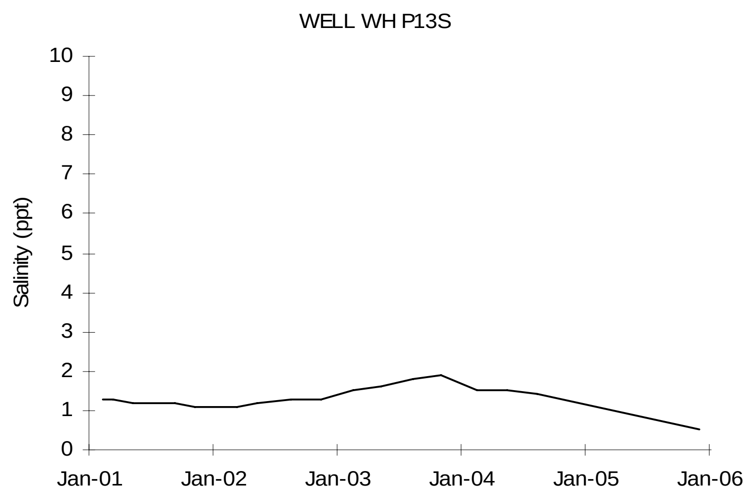


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)





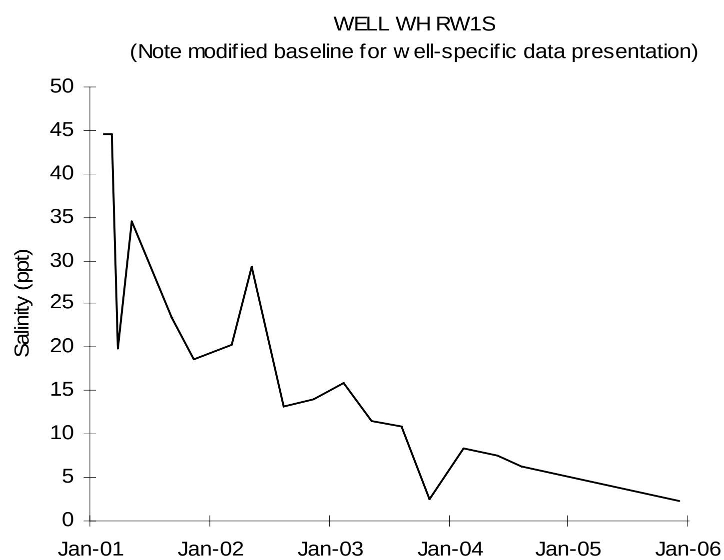
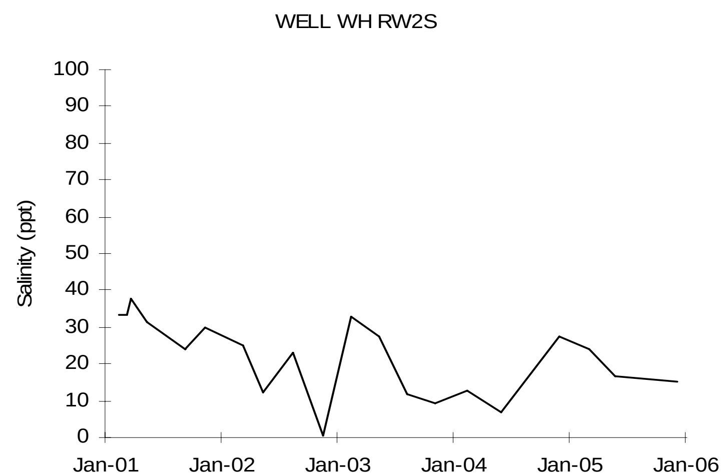
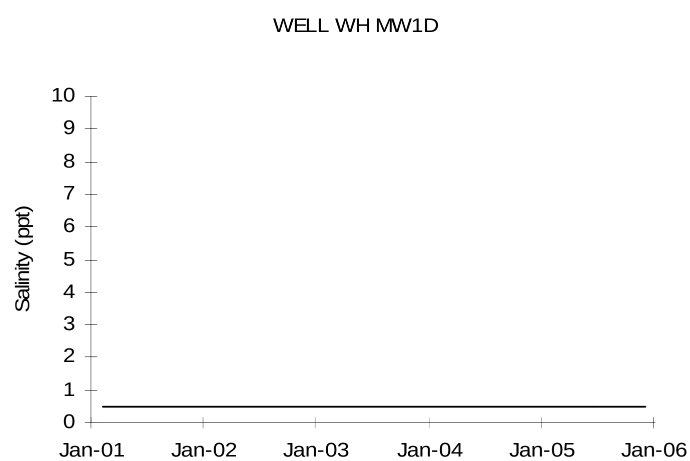


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)





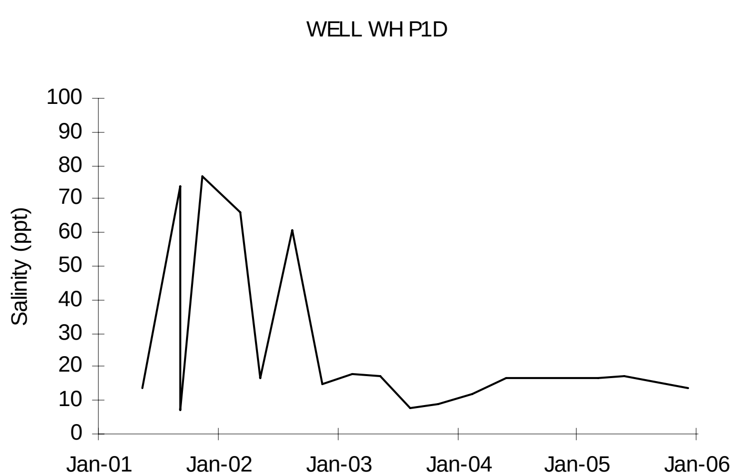
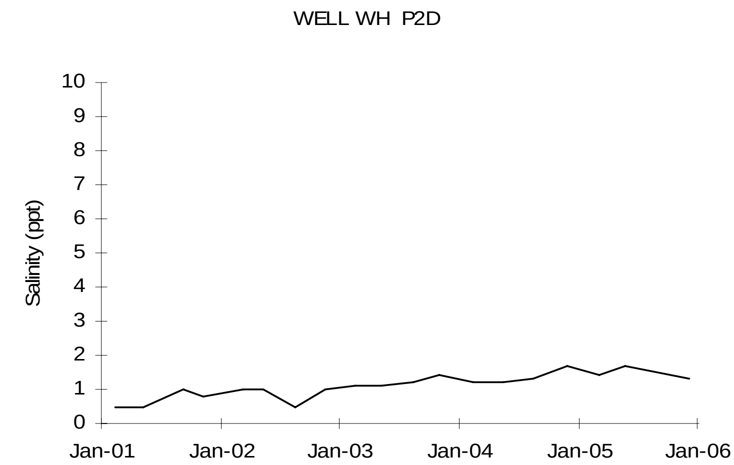
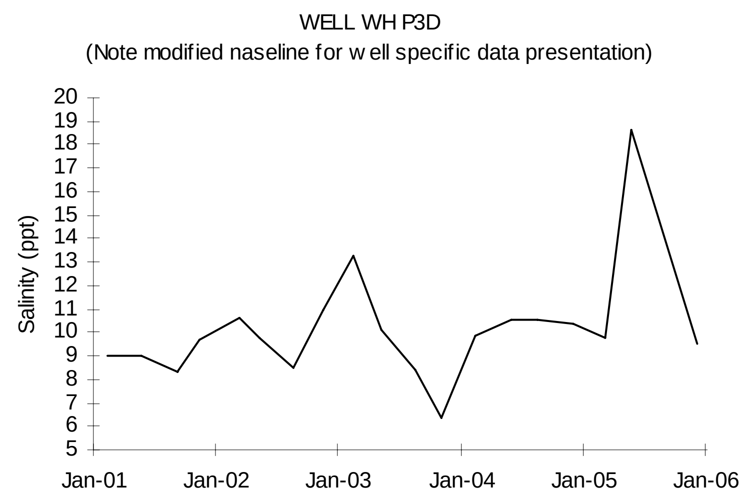


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)





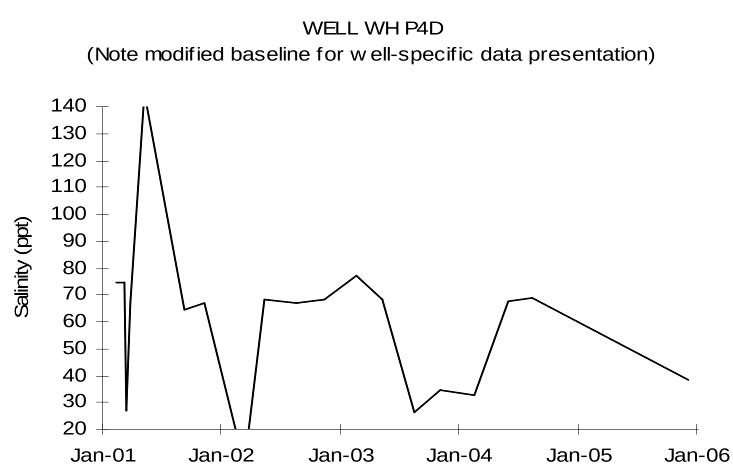
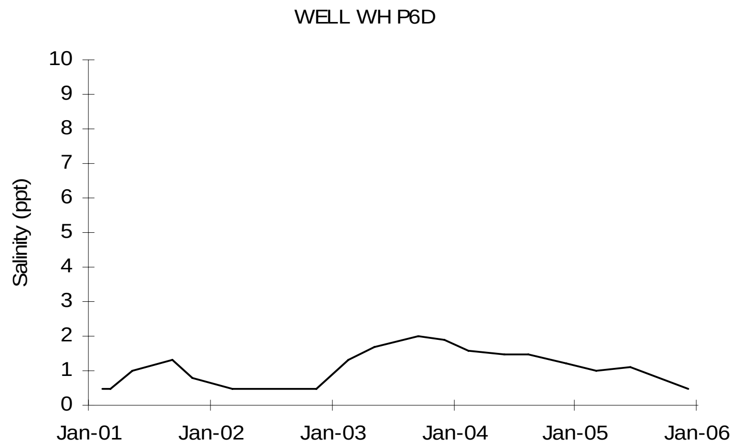
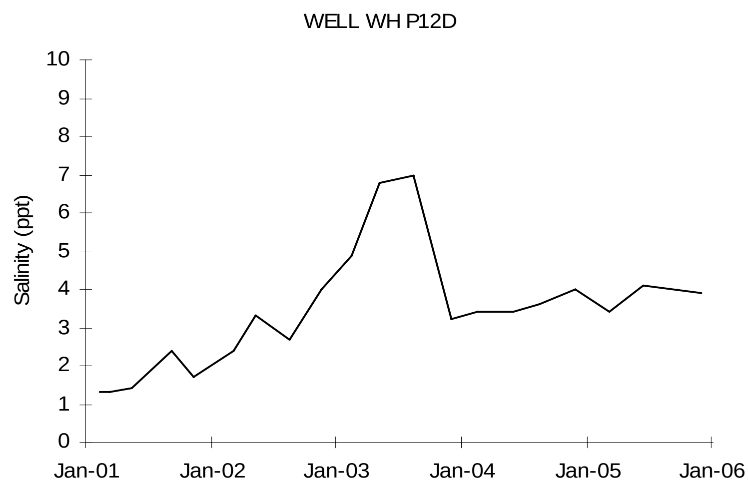


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)





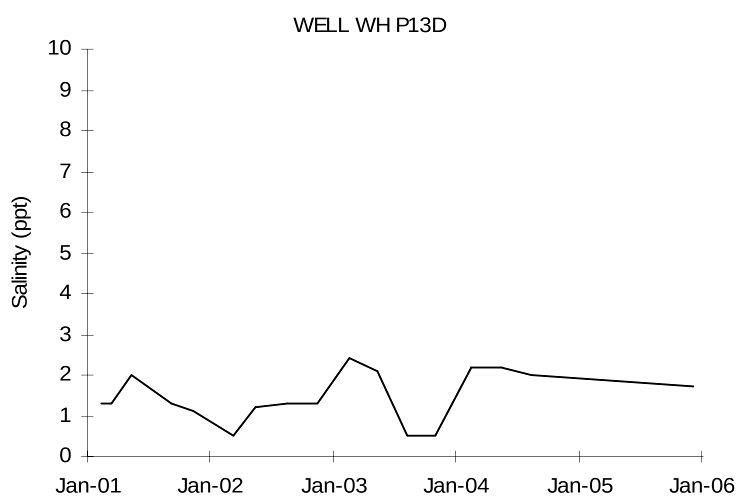
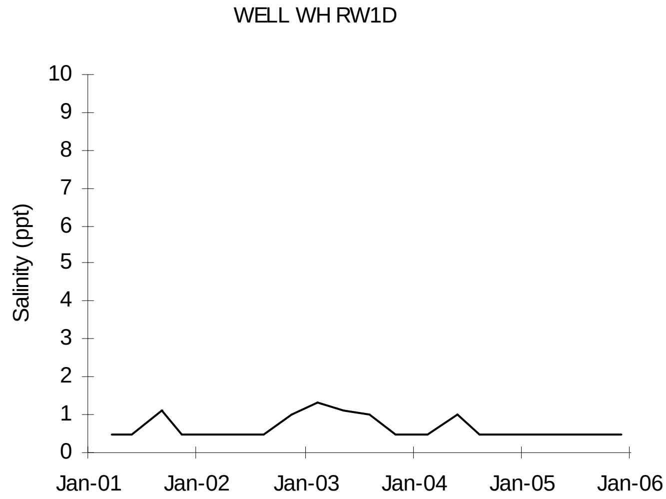
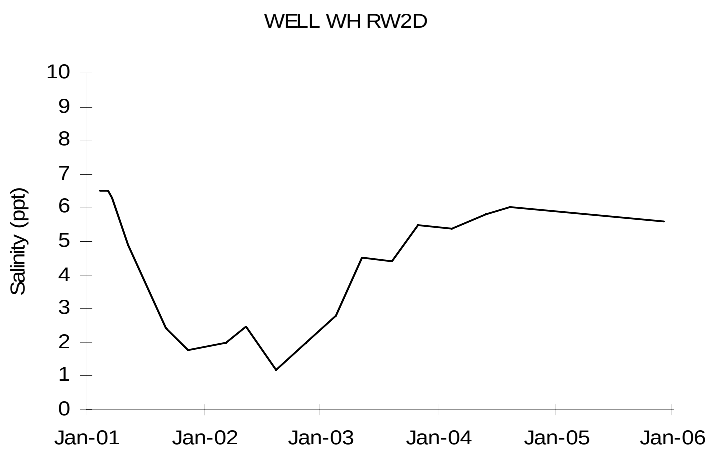


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)





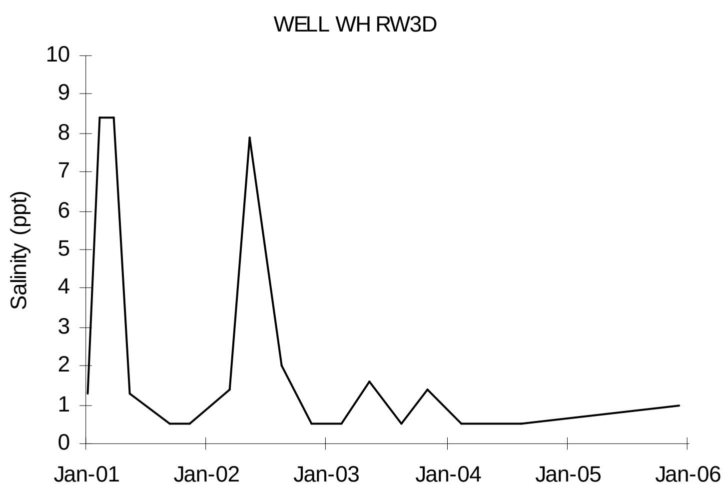
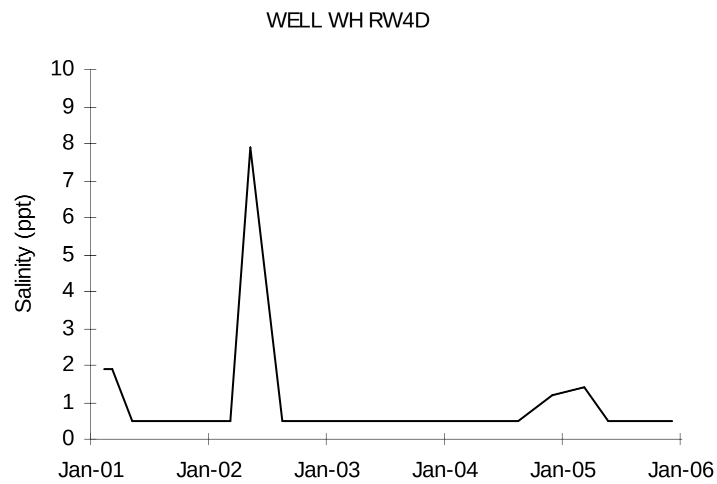
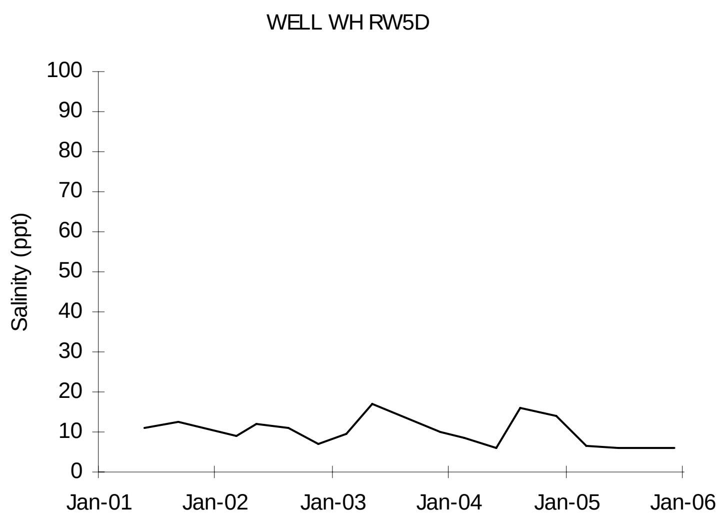
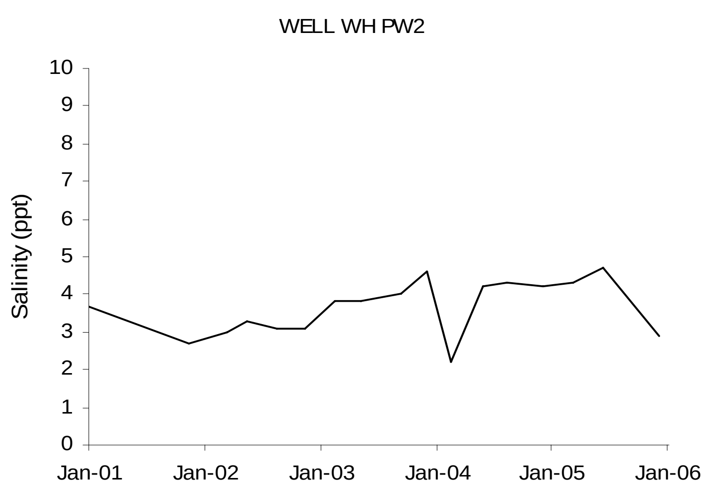


Figure 6-10. West Hackberry Ground Water Well Salinities (continued)







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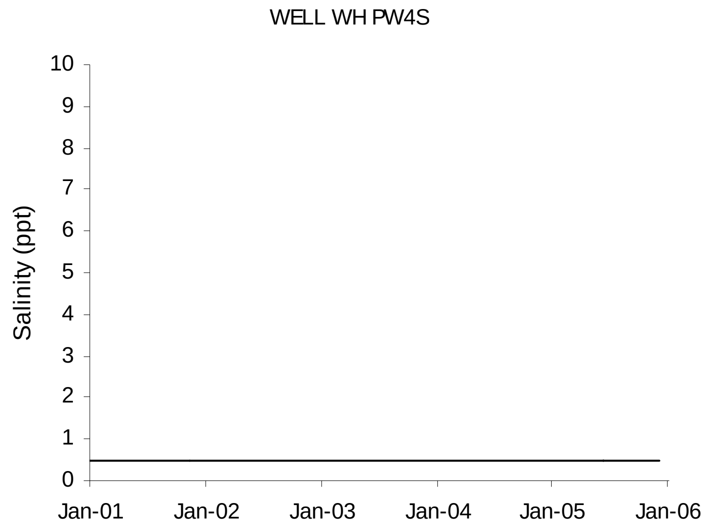

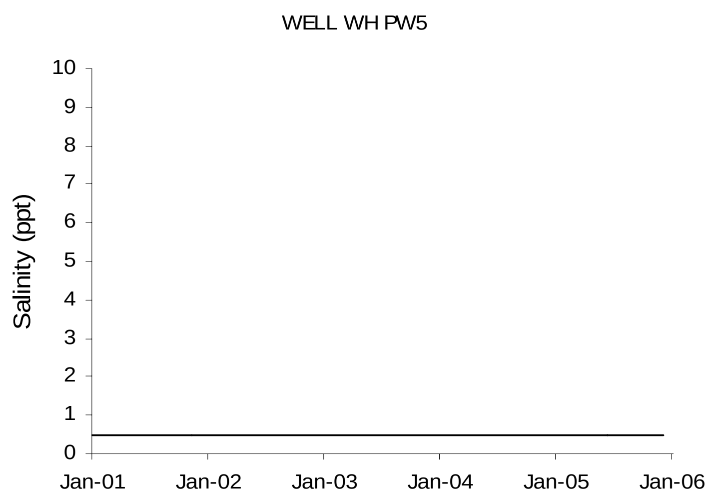

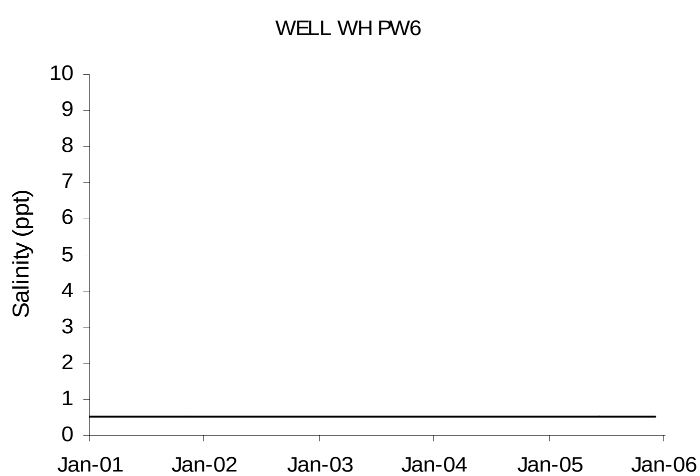

Figure 6-10. West Hackberry Ground Water Well Salinities (continued)

Once the pumping wells were shut-in at the end of the continued pumping commencing in 2001, a 5 quarter evaluation interval was conducted that would cover 4 complete reporting periods under full shut-in, the routine physicochemical data were collected and reported with very little interpretation leading to a detailed Summary Report at the conclusion. This Summary Report, mailed to LDNR in September, 2002, presented all of the resulting data in both tabular and graphical forms and made direct comparisons to historical averages compiled during recovery as well as to the last pumping data points on a well by well basis.

The primary focus was on any discernible changes in salinity at the wells around the site; however, water elevation changes within both monitored zones were showcased with time series hydrographs and with quarter by quarter contour mapping. The year of no pumping produced no dramatic salinity ramifications as some wells around the immediate former pond area noticeably improved (freshened) while others became more saline. The cones of depression previously developed in both zones collapsed (filled in) more rapidly and noticeably in the shallow zone, however, this phenomenon was quite lengthy in duration which supported the long held suspicion that the zone is at best a leaky or semi-confined water bearing unit receiving some recharge locally perhaps even on the site. The underlying (less permeable) deep zone required a longer period to reveal a reversion to more ambient conditions. Again, this observation supports the concept of this water bearing unit being recharged primarily offsite, although leak-by at the limited deeper well locations cannot be discounted. A Second-Year, Year-Long Evaluation Report was prepared in 2003 representing a comprehensive review of the continued changes resulting from the cessation of recovery pumping for a second year and which also proposed the same reinstatement of long-term site-wide ground water detection monitoring, which was not officially acted upon by the agency until early in 2004. After several exchanges of information via email a final letter was issued from LDNR's Office of Conservation that authorized the West Hackberry ground water recovery to revert to site-wide ground water monitoring per the proposal of September 2002, and which also concurred with the closure complete petition made for the interconnected brine pond system. This letter authority effectively allowed the site to re-commence site wide detection monitoring activities and also terminated the permits issued for the brine storage and management pits and the raw water holding pit.

Former recovery well salinity measurements depict a complex picture of ground water impacts beneath the former pond system. Salinity remains more elevated and spatially variable in the shallow zone than the deep zone with the exception of the two deep zone wells WH P1D and WH P4D on opposing west and east sides of the brine pond, respectively, where salinity, even though highly variable, has in the past inexplicably exceeded that of any other well. Both of these wells have shown marked improvement since recovery cessation and WH P1D has approached 10 ppt cut-off.

An essentially stable brine plume exists in an east-northeastward shaped ellipse beneath the brine pond in the shallow zone from the southwest corner over to well WH P3-S. The saline ground water is defined primarily by five wells now. Recovery wells WH P1S and WH P5S formerly tugging on the plume from the west side of the pond show notable freshening once the pumping ceased. Salinity in wells WH RW1S and WH RW2S on the south side, and WH P4S on the east side each now trend. However, only WH P3S, in the center of the historic plume, now traces an apparent trend of increasing salinity over this year's five-year window presumably due to the rather large fluctuations in the historic dataset. Wide salinity fluctuations seen on the data traces of these affected wells are attributed to salinity/density stratification occurring within each well and to the oscillating cones of depression affecting both zones over time since recovery shut-in especially for those wells where fresher water mixes occurred when pumping was in effect. Wide salinity swings were also noted with both of the wells WH P2S and WH P3S as these were the only two wells where the high volume submersible pumps were used near the end of the recovery program.

Until sporadic spikes of elevated salinity were experienced with pond closure construction early in 1999, a slight decreasing salinity trend had been observed at wells WH P1S, WH P5S, and WH RW1S along the west side of the former brine pond. Each of the wells exhibits a response to closure construction that eventually began to subside sometime in 2000 and even more so since recovery cessation. This time-series signature is especially noticeable in well WH P5S and is reflected in the post-closure data of the other two. In fact, wells WH P1S and WH P5S both began exhibiting salinity below the 10 ppt cut-off within CY2002 with nearby well WH RW1S joining them in that range for 2004 and remaining so for CY2005.

Many shallow wells reveal an obvious salinity drop upon cessation of active recovery, this would be indicative of fresher recharge and to wells no longer pulling salty water through the formation to their screens. Relatively few (most notably hard pumped well WH P3S) responded with an abrupt salinity spike at shut-in. These wells were formerly pulling a fresher water mix across their screened length when actively pumping. With the pre-recovery ground water movement to the east now returning, it is expected that wells on the west side of the pond will eventually capture fresher, uncontaminated ground water from the western recharge area as the source of brine contamination was removed with pond closure in late 1999. The two shallow pumping wells WH P1S and WH P5S have already responded this way. This improving salinity response will undoubtedly be delayed to the wells on the east and situated directly in the core of the plume as the overlying salt impregnated soils slowly respond to the now diminished available percolation and to the slow post-closure recharge.

Ground water salinity conditions over most of the site have improved and have also settled into a gradual freshening trend. As the five-year window for each well progresses beyond the former recovery operations, the graphs should reveal a very “quiet” shallow ground water monitoring regime similar to the response which began to occur shortly after the pond system was closed in early 1999 and also when the recovery pumping was ceased in the spring of 2001.Shallow monitoring wells WH P8, WH P9, and WH P11 at caverns 8, 9, and 11, respectively, are located away from the brine pond and intercept unaffected waters that are near ambient levels, compared to up-gradient well WH P6S. Two of these wells (WH P8 and WH P11) have detected minor localized impacts from former firewater line leakage and have since returned to ambient unaffected levels over the present five-year history. These two wells are tested annually now for salt content per the approved monitoring plan.

Shallow zone monitoring wells WH P6S, WH P12S, and WH P13S, and deep zone monitoring wells WH P2D, WH P6D, WH P12D, WH P13D, and WH MW1D are nearer the brine pond than wells at the caverns and along the site's perimeter and with the exception of well WH P12S, also intercept ambient ground water. Well WH P12S is the only down gradient monitoring well that is affected by the shallow zone brine plume, extending eastward from the former brine pond. Its salinity remains elevated (29.4 ppt annual average in 2005) which has been generally consistent since sampling began in 1992 (range 13.1 to 39 ppt, Std. D = 6.36 ppt, avg. = 27.88 ppt, n = 54); however, the well has shown a reversal of an historic freshening trend that commenced the last half of 1998. An overall gradual rise in salinity noted for 2000 and continuing into 2005 may have been a delayed (travel time) response to the closure construction spikes seen nearer the former pond early in 1999 and perhaps the gradual down gradient plume movement towards this well. The overall trend since 1992 to present is slightly downward, however, the annual data for 2004 which revealed an "up tick" at the close of the year was reversed in 2005, and the general trace of the 5-year window (2001 to 2005), although quite variable, indicates a gradual rise in salinity for the period. This monitoring position is about 300 feet east and down gradient of the closed brine pond system. As defined in the final approved closure plan, the liner beneath the pond's weight was required to be pierced to preclude any future concerns with long-term hydraulics. As a result, the soils beneath this liner, presumably, continue to respond to rainfall conditions and events.

7. QUALITY ASSURANCE

The SPR sites undergo periodic evaluation throughout the year in the form of annual internal audits as well as inspections by outside federal and state agencies. The structured laboratory quality assurance program has continued through the systematic application of acceptable accuracy and precision criteria at SPR laboratories. Compliance with this and other environmental program requirements was reviewed and evaluated at each site by means of DM's Organizational Assessments and program inspections at selected sites by state and federal environmental agencies. Results from the environmental program assessments are addressed in Section 2 of this report.

7.1 FIELD QUALITY CONTROL

All field environmental monitoring and surveillance activities are performed in accordance with standard procedures, which are maintained in DM’s Laboratory Programs and Procedures Manual, the Environmental Monitoring Plan and in individual sampling and analytical work instructions. These procedures include maintenance of chain-of-custody, collection of quality control (QC) samples, and field documentation.

7.2 DATA MANAGEMENT

SPR and contractor laboratories generate SPR data. All data generated by SPR laboratories are recorded and maintained in bound, numbered, and signed laboratory notebooks. Contractor laboratory data and accompanying QC data are received by the site laboratory or environmental department and retained on site as part of the original data file.

Water quality data are added to the SPR ES&H Management Information System (SEMIS) for retention, manipulation, and interpretation. The data are compiled and appear in various reports such as this Site Environmental Report, in support of assessments of the SPR, evaluations of explained events, and development of appropriate responses.

7.3 LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY LABORATORY ACCREDITATION PROGRAM (LELAP)

The Louisiana Department of Environmental Quality (LDEQ) has mandated that any commercial laboratory submitting environmental results from samples to the state must be accredited by the state. DOE requested that all SPR laboratories, including those in Texas, participate in the accreditation program on a voluntary basis as the SPR laboratories are not by definition "commercial". As part of this program the laboratories are required to analyze Performance Evaluation samples twice per calendar year, once in each the first and third quarter. Through this program, LDEQ ensures verifiable and consistent data generation by requiring the environmental analytical laboratories of permitted dischargers to perform analysis on blind samples for each of the permit parameters. The Bayou Choctaw, Big Hill, Bryan Mound and West Hackberry laboratories have completed and renewed their accreditations annually sense the inception of the program (CY2001). The Texas sites are accredited through this program because they may serve as a backup to the Louisiana site laboratories. The laboratories have successfully completed the first and third quarter 2005 round of blind samples. Resultant data was provided to LDEQ, via the Performance Evaluation (PE) sample contractor/provider, on a standard report form. The results of this study indicate that all SPR laboratories performed acceptably and are approved for continued DMR/LPDES analyses.

7.4 SPR LABORATORY ACCURACY AND PRECISION PROGRAM

The SPR laboratory quality assurance program is based on the U.S. EPA Handbook for Analytical Quality Control in Water and Wastewater Laboratories. This program focuses on the use of solvent or standard and method blanks, check standards, and for instrumental methods, final calibration blanks and final calibration verification standards with each analytical batch to verify quality control. Additionally, replicate and spiked samples are analyzed at a 10 percent frequency to determine precision and accuracy, respectively.

Analytical methodology is based on the procedures listed in Table 7-1. Over two thousand of these quality assurance analyses were performed in 2005 to verify the continuing high quality of SPR laboratory data.

The EPA quality control document advocates use of quality control charts to maintain and evaluate accuracy and precision data. The SPR uses a computer program to allow rapid and exact determinations of accuracy and precision without the necessity of manual quality control chart preparation.

7.5 CONTROL OF SUBCONTRACTOR LABORATORY QUALITY ASSURANCE

The M&O Contractor subcontracts some of the required analytical work. The Laboratories Programs and Procedures Manual contains mandatory guidelines by which such contracts must be prepared. In addition, the respective laboratory staff and M&O Contractor Quality Assurance, Operations and Maintenance, and Environmental staff review laboratory procurement documents.

Subcontractor laboratory service vendors are selected from an approved vendors list maintained by the M&O Contractor Quality Assurance organization. The successful bidder must be on the approved vendors list prior to the start of the laboratory contract. Vendors on the approved list are periodically reassessed by the M&O Contractor Quality Assurance and Operations and Maintenance organizations for adequacy of their analytical and quality assurance program.

Table 7-1. SPR Wastewater Analytical Methodology

Parameter	**Method**	**Source***	**Description**
Biochemical Oxygen Demand	5210(B) 405.1	APHA EPA-1	5 Day, 20°C 5 Day, 20° C
Chemical Oxygen Demand	D1252-88(B) 410.4 5220(D)	ASTM EPA-1 APHA	Micro Spectrophotometric Proc. Colorimetric, Manual Closed Reflux, Colorimetric
Fecal Coliform	Part III-C-2 9222(D)	EPA-2 APHA	Direct Membrane Filter Method Membrane Filter Procedure
Residual Chlorine	4500-C1(G) 330.5 8021	APHA EPA-1 Hach	DPD Colorimetric Spectrophotometric, DPD DPD Method
Oil & Grease (Total, Recoverable)	413.1	EPA-1	Gravimetric, Separatory Funnel Extraction
Oil & Grease (Partition, Gravimetric)	5520-(B)	APHA	Gravimetric, Separatory Funnel Extraction
Total Organic Carbon	415.1 D4839-88 5310(C) D2579(A) 5310(B)	EPA-1 ASTM APHA ASTM APHA	Combustion or Oxidation Persulfate – UV Oxidation, IR Combustion – IR
Dissolved Oxygen	D888-87(D) 360.1 360.2 4500-O(C) 4500-O(G)	ASTM EPA-1 EPA-1 APHA APHA	Membrane Electrode Membrane Electrode Winkler Method with Azide Mod. Winkler Method with Azide Mod. Membrane Electrode
Hydrogen Ion conc. (pH)	D1293-84(A&B) 150.1 4500-H^+(B)	ASTM EPA-1 APHA	Electrometric Electrometric Electrometric
Total Dissolved Solids (Residual, Filterable)	160.1 2540(C)	EPA-1 APHA	Gravimetric, Dried at 180°C Gravimetric, Dried at 180°C
Total Suspended Solids (Residual, Non-Filterable)	160.2 2540(D)	EPA-1 APHA	Gravimetric, Dried at 103-105°C Gravimetric, Dried at 103-105°C
Salinity	D4542-85 (Sect. 7) 2520(B) & 2510 210B	ASTM APHA APHA (16th Ed.)	Refractometric Electrical Conductivity Hydrometric

Table 7-1. SPR Wastewater Analytical Methodology (continued)

Parameter	Method	Source*	Description
Biomonitoring	1006.0 1007.0	EPA-3 EPA-3	Menidia beryllina 7 day survival Mysidopsis bahia 7 day survival
Copper	200.7	EPA-1	Inductively coupled plasma atomic emission spectrometric method for trace element analysis of water and waste.

EPA-1 = U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Wastes, Document No. EPA - 600/4-79-020, March 1983.

APHA = American Public Health Association, et al., Standard Methods for the Examination of Water and Wastewater, 17th Ed., 1989.

EPA-2 = U.S. EPA, Microbiological Methods for Monitoring the Environment: Water and Wastes, Document No. EPA-600/8-78-017, December 1978.

ASTM = American Society for Testing and Materials, Annual Book of Standards, Section 11 - Water, Volumes 11.01 and 11.02, 1990.

Hach = Hach Company, Hach Water Analysis Handbook, 2nd Ed., 1992

EPA-3 = U.S. EPA, Short Term Methods for Estimnating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Document No. EPA/600/4-87/028.

Appendix A
SPR - DM ENVIRONMENTAL STANDARDS

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STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
07 USC Chapter 6	CS	Insecticides And Environmental Pesticide Control
10 CFR 1021	MR	National Environmental Policy Act Implementing Procedures
10 CFR 1022	MR	Compliance With Floodplain And Wetland Environmental Review Requirements
10 CFR 835	RP	Occupational Radiation Protection
10 USC 2692	HW	Storage, treatment, and disposal of nondefense toxic and hazardous materials
14 CFR 121	IS	Operating Requirements: Domestics, Flag, And Supplemental Operations
14 CFR 125	IS	Certification And Operations: Airplanes Having A Seating Capacity Of 20 Or More Passengers Or A Maximum Payload Capacity Of 6,000 Pounds Or More; And Rules Governing Persons On Board Such Aircraft
14 CFR 129	IS	Operations: Foreign Air Carriers And Foreign Operators Of U.S.-Registered Aircraft Engaged In Common Carriage
14 CFR 133	IS	Rotorcraft External-Load Operations
14 CFR 135	IS	Operating Requirements: Commuter And On Demand Operations And Rules Governing Persons On Board Such Aircraft
14 CFR 137	IS	Agricultural Aircraft Operations
14 CFR 139	IS	Certification Of Airports
14 CFR 145	IS	Repair Stations
14 CFR 077	IS	Objects Affecting Navigable Airspace
14 CFR 091	IS	General Operating And Flight Rules
27 CFR 555	IS, CS, FP	Commerce In Explosives
29 CFR 1903.13	IS	Imminent Danger
29 CFR 1903.2	IS	Posting Of Notice; Availability Of The Act, Regulations And Applicable Standards
29 CFR 1904	MO	Recording And Reporting Occupational Injuries And Illnesses
29 CFR 1910 Subpart A	IS, FP	General
29 CFR 1910 Subpart B	IS	Adoption And Extension Of Established Federal Standards
29 CFR 1910 Subpart D	IS	Walking-Working Surfaces
29 CFR 1910 Subpart E	IS	Exit Routes, Emergency Action Plans, And Fire Prevention Plans
29 CFR 1910 Subpart F	IS	Powered Platforms, Manlifts, And Vehicle-Mounted Work Platforms
29 CFR 1910 Subpart G	IS	Occupational Health And Environmental Control
29 CFR 1910 Subpart H	IS, CS, FP	Hazardous Materials
29 CFR 1910 Subpart I	IS	Personal Protective Equipment
29 CFR 1910 Subpart J	IS, FP	General Environmental Controls

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
29 CFR 1910 Subpart K	MS	Medical And First Aid
29 CFR 1910 Subpart L	IS, FP	Fire Protection
29 CFR 1910 Subpart M	IS	Compressed Gas And Compressed Air Equipment
29 CFR 1910 Subpart N	IS	Materials Handling And Storage
29 CFR 1910 Subpart O	IS	Machinery And Machine Guarding
29 CFR 1910 Subpart P	IS	Hand And Portable Powered Tools And Other Hand-Held Equipment
29 CFR 1910 Subpart Q	IS	Welding, Cutting, And Brazing
29 CFR 1910 Subpart R	IS	Special Industries (Electric Power Generation, Transmission, And Distribution)
29 CFR 1910 Subpart R	IS	Special Industries (Telecommunications)
29 CFR 1910 Subpart S	IS	Electrical
29 CFR 1910 Subpart T	IS	Commercial Diving Operations
29 CFR 1910 Subpart Z	IH	Toxic And Hazardous Substances
29 CFR 1926 Subpart A	MO	General
29 CFR 1926 Subpart B	IS	General Interpretations
29 CFR 1926 Subpart C	IS, FP	General Safety And Health Provisions
29 CFR 1926 Subpart D	IS	Occupational Health And Environmental Controls
29 CFR 1926 Subpart E	IS, FP	Personal Protective And Life Saving Equipment
29 CFR 1926 Subpart F	IS, FP	Fire Protection And Prevention
29 CFR 1926 Subpart G	IS	Signs, Signals, And Barricades
29 CFR 1926 Subpart H	IS	Materials Handling, Storage, Use, And Disposal
29 CFR 1926 Subpart I	IS	Tools-Hand And Power
29 CFR 1926 Subpart J	IS	Welding And Cutting
29 CFR 1926 Subpart K	IS	Electrical
29 CFR 1926 Subpart L	IS	Scaffolds
29 CFR 1926 Subpart M	IS	Fall Protection
29 CFR 1926 Subpart N	IS	Cranes, Derricks, Hoists, Elevators, And Conveyors
29 CFR 1926 Subpart O	IS	Motor Vehicles, Mechanized Equipment, And Marine Operations
29 CFR 1926 Subpart P	IS	Excavations
29 CFR 1926 Subpart Q	IS	Concrete And Masonry Construction
29 CFR 1926 Subpart R	IS	Steel Erection
29 CFR 1926 Subpart S	IS	Underground Construction, Caisson, Cofferdams And Compressed Air

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
29 CFR 1926 Subpart T	IS	Demolition
29 CFR 1926 Subpart U	IS	Blasting And Use Of Explosives
29 CFR 1926 Subpart V	IS	Power Transmission And Distribution
29 CFR 1926 Subpart W	IS	Rollover Protective Structures; Overhead Protection
29 CFR 1926 Subpart X	IS	Stairways And Ladders
29 CFR 1926 Subpart Y	IS	Commercial Diving Operations
29 CFR 1926 Subpart Z	IH	Toxic And Hazardous Substances
29 CFR Appendix A To Part 1926	IS	New Designations For General Industry Standards Incorporated Into Body Of Construction Standards
33 CFR 126	CW	Handling Of Dangerous Cargo At Waterfront Facilities
33 CFR 153	CW	Control Of Pollution By Oil And Hazardous Substances, Discharge Removal
33 CFR 154	CW	Facilities Transferring Oil Or Hazardous Material In Bulk
33 CFR 156	CW	Oil And Hazardous Material Transfer Operations
33 CFR 158	CW	Reception Facilities For Oil, Noxious Liquid Substances, And Garbage
33 CFR 322	CW	Permits For Structures Or Work In Or Affecting Navigable Waters Of The United States
33 CFR 323	CW	Permits For Discharges Of Dredged Or Fill Material Into Waters Of The United States
33 CFR 325	CW	Processing Of Department Of The Army Permits
33 CFR 326	CW	Enforcement
33 CFR 328	CW	Definition Of Waters Of The United States
33 CFR 329	CW	Definition Of Navigable Waters Of The United States
33 CFR 330	CW	Nationwide Permit Program
33 CFR 064	CW	Marking Of Structures, Sunken Vessels And Other Obstructions
33 CFR 066	CW	Private Aids To Navigation
33 CFR 067	CW	Aids To Navigation On Artificial Islands And Fixed Structures
36 CFR 800	MR	Protection Of Historic Properties
40 CFR Appendix A To Part 60	CA	Test Methods
40 CFR 109	CW	Criteria For State, Local And Regional Oil Removal Contingency Plans
40 CFR 110	CW	Discharge Of Oil
40 CFR 112	CW	Oil Pollution Prevention
40 CFR 116	CW	Designation Of Hazardous Substances

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
40 CFR 117	CW	Determination Of Reportable Quantities For Hazardous Substances
40 CFR 121	CW	State Certification Of Activities Requiring A Federal License Of Permit
40 CFR 122	CW	EPA Administered Permit Programs: The National Pollutant Discharge Elimination System
40 CFR 124	CW	Procedures For Decision Making
40 CFR 125	CW	Criteria And Standards For The National Pollutant Discharge Elimination System
40 CFR 129	CW	Toxic Pollutant Effluent Standards
40 CFR 130	CW	Water Quality Planning And Management
40 CFR 131	CW	Water Quality Standards
40 CFR 133	CW	Secondary Treatment Regulation
40 CFR 136	CW	Guidelines Establishing Test Procedures For The Analysis Of Pollutants
40 CFR 141	CW	National Primary Drinking Water Regulations
40 CFR 142	CW	National Primary Drinking Water Regulations Implementation
40 CFR 143	CW	National Secondary Drinking Water Regulations
40 CFR 144	CW	Underground Injection Control Program
40 CFR 146	CW	Underground Injection Control Program: Criteria And Standards
40 CFR 147	CW	State Underground Injection Control Programs
40 CFR 149	CW	Sole Source Aquifers
40 CFR 1500	MR	Purpose, Policy, And Mandate
40 CFR 1501	MR	NEPA And Agency Planning
40 CFR 1502	MR	Environmental Impact Statement
40 CFR 1503	MR	Commenting
40 CFR 1504	MR	Predecision Referrals To The Council Of Proposed Federal Actions Determined To Be Environmentally Unsatisfactory
40 CFR 1505	MR	NEPA And Agency Decisionmaking
40 CFR 1506	MR	Other Requirements Of NEPA
40 CFR 1507	MR	Agency Compliance
40 CFR 1508	MR	Terminology And Index
40 CFR 1515	MR	Freedom Of Information Act Procedures
40 CFR 1516	MR	Privacy Act Implementation
40 CFR 152	CS	Pesticide Registration And Classification Procedures
40 CFR 156	CS	Labeling Requirements For Pesticides And Devices

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
40 CFR 170	CS	Worker Protection Standards For Agricultural Pesticides
40 CFR 171	CS	Certification Of Pesticide Applicators
40 CFR 220	CW	General (Ocean Dumping)
40 CFR 228	CW	Criteria For The Management Of Disposal Sites For Ocean Dumping
40 CFR 243	HW	Guidelines For The Storage And Collection Of Residential, Commercial, And Institutional Solid waste
40 CFR 247	HW	Guidelines For Procurement Of Products That Contain Recycled Material
40 CFR 260	HW	Hazardous Waste Management System: General
40 CFR 261	HW	Identification And Listing Of Hazardous Waste
40 CFR 262	HW	Standards Applicable To Generators Of Hazardous Waste
40 CFR 263	HW	Standards Applicable To Transporters Of Hazardous Waste
40 CFR 264	HW	Standards For Owners And Operators Of Hazardous Waste Treatment, Storage, And Disposal Facilities
40 CFR 266	HW	Standards For The Management Of Specific Hazardous Wastes And Specific Types Of Hazardous Waste Management Facilities
40 CFR 268	HW	Land Disposal Restrictions
40 CFR 272	HW	Approved State Hazardous Waste Management Programs
40 CFR 273	HW	Standards For Universal Waste Management
40 CFR 279	HW	Standards For The Management Of Used Oil
40 CFR 280	HW	Technical Standards And Corrective Action Requirements For Owners And Operators Of Underground Storage Tanks
40 CFR 282	HW	Approved Underground Storage Tank Programs
40 CFR 300	CS	National Oil And Hazardous Substances Pollution Contingency Plan
40 CFR 302	CS	Designation, Reportable Quantities, And Notification
40 CFR 355	CS	Emergency Planning And Notification
40 CFR 370	CS	Hazardous Chemical Reporting: Community Right-To-Know
40 CFR 372	CS	Toxic Chemical Release Reporting: Community Right-To-Know
40 CFR 373	CS	Reporting Hazardous Substance Activity When Selling Or Transferring Federal Real Property
40 CFR 401	CW	General Provisions (Effluent Guidelines And Standards)
40 CFR 403	CW	General Pretreatment Regulations For Existing And New Sources Of Pollution
40 CFR 52	CA	Approval And Promulgation Of Implementation Plans
40 CFR 53	CA	Ambient Air Monitoring Reference And Equivalent Methods
40 CFR 60	CA	Standards Of Performance For New Stationary Sources

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
40 CFR 61	CA	National Emission Standards For Hazardous Air Pollutants
40 CFR 63	CA	National Emission Standards For Hazardous Air Pollutants For Source Categories
40 CFR 66	CA	Assessment And Collection Of Noncompliance Penalties By EPA
40 CFR 70	CA	State Operating Permit Programs
40 CFR 700	CS	General (Toxic Substances Control Act)
40 CFR 761	CS	Polychlorinated biphenyls (PCBs) Manufacturing, Processing, Distribution In Commerce, And Use Prohibitions
40 CFR 763	IH, CS	Asbestos
40 CFR 80	CA	Regulation Of Fuels And Fuel Additives
40 CFR 81	CA	Designation Of Areas For Air Quality Planning Purposes
40 CFR 82	CA	Protection Of Stratospheric Ozone
42 USC Chapter 55	MR	National Environmental Policy
42 USC Chapter 85	CA	Air Pollution Prevention And Control
49 CFR 130	CS	Oil Spill Prevention And Response Plans
49 CFR 171	TS	General Information, Regulations, And Definitions
49 CFR 172	TS	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, And Training Requirements
49 CFR 173	TS	Shippers--General Requirements For Shipments And Packagings
49 CFR 177	TS	Carriage By Public Highway
49 CFR 178	TS	Specifications For Packagings
49 CFR 194	TS	Response Plans For Onshore Oil Pipelines
49 CFR 195	TS	Transportation Of Hazardous Liquids By Pipeline
49 CFR 199	TS	Drug And Alcohol Testing
49 CFR 383	TS	Commercial Driver's License Standards; Requirements And Penalties
50 CFR 10	MR	General Provisions (Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, And Importation Of Wildlife And Plants)
50 CFR 17	MR	Endangered And Threatened Wildlife And Plants
EO 11988	CW	Floodplain Management
EO 11990	CW	Protection of Wetlands
EO 11991	MR	Protection and Enhancement of Environmental Quality
EO 12088	MR	Federal Compliance with Pollution Control Requirements
EO 12898	MR	Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
EO 13101	PP	Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition
EO 13123	PP, MR	Greening the Government Through Efficient Energy Management
EO 13134	MR	Developing and Promoting Bio-Based Products and Bio-energy
EO 13148	MR	Greening the Government Through Leadership in Environmental Management
EO 13149	PP	Greening the Government Through Federal Fleet and Transportation Efficiency
EO 13158	CW	Marine Protected Area
EO 13186	MR	Responsibilities of Federal Agencies to Protect Migratory Birds
EO 13221	PP	Energy Efficient Standby Power Devices
LAC 07: XXIII	CS	Advisory Commission On Pesticides
LAC 07: XXV	CS	Structural Pest Control Commission
LAC 33: I.Chapter 03	MR	Adjudications
LAC 33: I.Chapter 13	MR	Risk Evaluation/Corrective Action Program
LAC 33: I.Chapter 14	MR	Groundwater Fees
LAC 33: I.Chapter 15	MR	Permit Review
LAC 33: I.Chapter 39	MR	Notification Regulations And Procedures For Unauthorized Discharges
LAC 33: I.Chapter 45	MR	Policy And Intent
LAC 33: I.Chapter 47	MR	Program Requirements
LAC 33: I.Chapter 49	MR	Organization And Personnel Requirements
LAC 33: I.Chapter 51	MR	On-Site Inspection/Evaluation
LAC 33: I.Chapter 53	MR	Quality System Requirements
LAC 33: I.Chapter 55	MR	Sample Protocol/Sample Integrity
LAC 33: I.Chapter 57	MR	Maintenance Of Accreditation
LAC 33: I.Chapter 69	MR	Emergency Response Regulations
LAC 33: III.Chapter 01	CA	General Provisions
LAC 33: III.Chapter 02	CA	Rules And Regulations For The Fee System Of The Air Quality Control Programs
LAC 33: III.Chapter 05	CA	Permit Procedures
LAC 33: III.Chapter 06	CA	Regulations On Control Of Emissions Through The Use Of Emission Reduction Credits Banking
LAC 33: III.Chapter 07	CA	Ambient Air Quality
LAC 33: III.Chapter 09	CA	General Regulations On Control Of Emissions And Emission Standards
LAC 33: III.Chapter 11	CA	Control Of Emissions Of Smoke
LAC 33: III.Chapter 13	CA	Emission Standards For Particulate Matter

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
LAC 33: III.Chapter 14	CA	Conformity
LAC 33: III.Chapter 15	CA	Emission Standards For Sulfur Dioxide
LAC 33: III.Chapter 17	CA	Control Of Emissions Of Carbon Monoxide (New Sources)
LAC 33: III.Chapter 21	CA	Control Of Emission Of Organic Compounds
LAC 33: III.Chapter 22	CA	Control Of Emissions Of Nitrogen Oxides (NOx)
LAC 33: III.Chapter 29	CA	Odor Regulations
LAC 33: III.Chapter 30	CA	Standards Of Performance For New Stationary Sources (NSPS)
LAC 33: III.Chapter 51	CA	Comprehensive Toxic Air Pollutant Emission Control Program
LAC 33: III.Chapter 53	CA	Area Sources Of Toxic Air Pollutants
LAC 33: III.Chapter 56	CA	Prevention Of Air Pollution Emergency Episodes
LAC 33: III.Chapter 59	CA	Chemical Accident Prevention And Minimization Of Consequences
LAC 33: IX.Chapter 01	CW	General Provisions
LAC 33: IX.Chapter 03	CW	Permits
LAC 33: IX.Chapter 05	CW	Enforcement
LAC 33: IX.Chapter 07	CW	Effluent Standards
LAC 33: IX.Chapter 09	CW	Spill Prevention And Control
LAC 33: IX.Chapter 11	CW	Surface Water Quality Standards
LAC 33: IX.Chapter 13	CW	Louisiana Water Pollution Control Fee System Regulation
LAC 33: IX.Chapter 15	CW	Water Quality Certification Procedures
LAC 33: IX.Chapter 17	CW	Rules Governing Disposal Of Waste Oil, Oil Field Brine, And All Other Materials Resulting From The Drilling For, Production Of, Or Transportation Of Oil, Gas Or Sulfur (As Amended January 27, 1953)
LAC 33: IX.Chapter 19	CW	State Of Louisiana Stream Control Commission
LAC 33: IX.Chapter 23	CW	Definitions And General LPDES Program Requirements
LAC 33: IX.Chapter 25	CW	Permit Application And Special LPDES Program Requirements
LAC 33: IX.Chapter 27	CW	LPDES Permit Conditions
LAC 33: IX.Chapter 29	CW	Transfer, Modification, Revocation And Reissuance, And Termination Of LPDES Permits
LAC 33: IX.Chapter 31	CW	General LPDES Program Requirements
LAC 33: IX.Chapter 33	CW	Specific Decisionmaking Procedures Applicable To LPDES Permits
LAC 33: IX.Chapter 49	CW	Incorporation By Reference
LAC 33: IX.Chapter 51	CW	Criteria For Extending Compliance Dates Under Section 301(i) Of The Act--Reserved
LAC 33: IX.Chapter 53	CW	Criteria And Standards For Best Management Practices Authorized Under Section 304(e) Of The Act--

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
		Reserved
LAC 33: IX.Chapter 55	CW	Criteria And Standards For Imposing Conditions For The Disposal Of Sewage Sludge Under Section 405 Of The Act--Reserved
LAC 33: IX.Chapter 57	CW	Toxic Pollutant Effluent Standards And Prohibitions
LAC 33: IX.Chapter 59	CW	Secondary Treatment Under The LPDES Program
LAC 33: IX.Chapter 61	CW	General Pretreatment Regulations For Existing And New Sources Of Pollution
LAC 33: IX.Chapter 65	CW	Additional Requirements Applicable To The LPDES Program
LAC 33: IX.Chapter 69	CW	Standards For The Use Or Disposal Of Sewage Sludge
LAC 33: IX.Chapter 71	CW	Appendices
LAC 33: V.Chapter 001	HW	General Provisions And Definitions
LAC 33: V.Chapter 009	HW	Manifest System For TSD Facilities
LAC 33: V.Chapter 011	HW	Generators
LAC 33: V.Chapter 013	HW	Transporters
LAC 33: V.Chapter 015	HW	Treatment, Storage, And Disposal Facilities
LAC 33: V.Chapter 017	HW	Air Emission Standards
LAC 33: V.Chapter 018	HW	Containment Buildings
LAC 33: V.Chapter 019	HW	Tanks
LAC 33: V.Chapter 020	HW	Integration With Maximum Achievable Control Technology (MACT) Standards
LAC 33: V.Chapter 021	HW	Containers
LAC 33: V.Chapter 022	HW	Prohibitions On Land Disposal
LAC 33: V.Chapter 024	HW	Hazardous Waste Munitions And Explosives Storage
LAC 33: V.Chapter 026	HW	Corrective Action Management Units And Special Provisions For Cleanup
LAC 33: V.Chapter 030	TS	Hazardous Waste Burned In Boilers And Industrial Furnaces
LAC 33: V.Chapter 037	HW	Financial Requirements
LAC 33: V.Chapter 038	HW	Universal Wastes
LAC 33: V.Chapter 040	PP	Used Oil
LAC 33: V.Chapter 041	PP	Recyclable Materials
LAC 33: V.Chapter 049	HW	Lists Of Hazardous Waste
LAC 33: V.Chapter 051	HW	Fee Schedules
LAC 33: V.Chapter 101	HW	Hazardous Material Information Development, Preparedness, And Response Act
LAC 33: V.Chapter 103	HW	Motor Carrier Safety And Hazardous Materials

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
LAC 33: V.Chapter 105	HW	Hazardous Waste Regulations For Carriage By Highway, Rail, Air, And Vessel
LAC 33: V.Chapter 301	HW	Transportation Of Hazardous Liquids By Pipeline [49 CFR Part 195]
LAC 33: V.Chapter 302	HW	Transportation Of Hazardous Liquids By Pipeline--Construction [49 CFR Part 195 Subpart D]
LAC 33: V.Chapter 303	HW	Transportation Of Hazardous Liquids By Pipeline--Pressure Testing [49 CFR Part 195 Subpart E]
LAC 33: V.Chapter 304	HW	Transportation Of Hazardous Liquids By Pipeline--Operation And Maintenance [49 CFR Part 195 Subpart F]
LAC 33: V.Chapter 305	HW	Transportation Of Hazardous Liquids By Pipeline--Qualification Of Pipeline Personnel [49 CFR Part 195 Subpart G] And Corrosion Control [49 CFR Part 195 Subpart H]
LAC 33: V.Chapter 309	HW	Transportation Of Hazardous Liquids By Pipeline--Appendices [49 CFR Part 195]
LAC 33: VII.Chapter 01	HW	General Provisions And Definitions
LAC 33: VII.Chapter 03	HW	Scope And Mandatory Provisions Of The Program
LAC 33: VII.Chapter 05	HW	Solid Waste Management System
LAC 33: VII.Chapter 07	HW	Solid Waste Standards
LAC 33: VII.Chapter 09	HW	Enforcement
LAC 33: VII.Chapter 103	PP	Recycling And Waste Reduction Rules
LAC 33: VII.Chapter 105	PP	Waste Tires
LAC 33: XI.Chapter 01	HW	Program Applicability And Definitions (UST)
LAC 33: XI.Chapter 03	HW	Registration Requirements, Standards And Fee Schedule
LAC 33: XI.Chapter 05	HW	General Operating Requirements
LAC 33: XI.Chapter 07	HW	Methods Of Release Detection And Release Reporting Investigation, Confirmation And Response
LAC 33: XI.Chapter 09	HW	Out-Of-Service UST Systems And Closure
LAC 33: XI.Chapter 15	HW	Enforcement
LAC 33: XV.Chapter 01	RP	General Provisions (Radiation Protection)
LAC 33: XV.Chapter 02	RP	Registration Of Radiation Machines And Facilities
LAC 33: XV.Chapter 03	RP	Licensing Of Radioactive Material
LAC 33: XV.Chapter 04	RP	Standards For Protection Against Radiation
LAC 33: XV.Chapter 05	RP	Radiation Safety Requirements For Industrial Radiographic Operations
LAC 33: XV.Chapter 08	RP	Radiation Safety Requirements For Analytical X-Ray Equipment
LAC 33: XV.Chapter 10	RP	Notices, Instructions, And Reports To Workers; Inspections
LAC 33: XV.Chapter 14	RP	Regulation And Licensing Of Naturally Occurring Radioactive Material (NORM)
LAC 33: XV.Chapter 15	RP	Transportation Of Radioactive Material
LAC 33: XV.Chapter 17	RP	Licensing And Radiation Safety Requirements For Irradiators

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
LAC 33: XV.Chapter 20	RP	Radiation Safety Requirements For Wireline Service Operations And Subsurface Tracer Studies
LAC 33: XV.Chapter 25	RP	Fee Schedule
LAC 43: I.Chapter 07	CW	Coastal Management
LAC 43: VI.Chapter 01	CW	General Provisions (Ground Water Management)
LAC 43: VI.Chapter 03	CW	Critical Ground Water Area Application Procedure
LAC 43: VI.Chapter 05	CW	Hearings
LAC 43: VI.Chapter 07	CW	Water Well Notification Requirements in Non-Critical Ground Water Areas
LAC 43: XIX.Chapter 01	CW	General Provisions Statewide Order No. 29-B
LAC 43: XIX.Chapter 03	CW	Pollution Control--Onsite Storage, Treatment And Disposal Of Nonhazardous Oilfield Waste (NOW) Generated From The Drilling And Production Of Oil And Gas Wells (Oilfield Pit Regulations)
LAC 43: XVII.Chapter 01	CW	Regulations For Class I, III, IV And V Injection Wells Statewide Order No. 29-N-1
LAC 43: XVII.Chapter 03	CW	Regulations For Hydrocarbon Storage Wells In Salt Dome Cavities Statewide Order No. 29-M
LAC 48: V.Chapter 73	CW	Certification Water And Wastewater Operator
LAC 48: V.Chapter 77	CW	Drinking Water Program
TAC 04: I.Chapter 07	CS	Pesticides
TAC 16: I.Chapter 03	CW, HW, TS	Oil And Gas Division
TAC 25: I.Chapter 289	IH, IS, RP	Radiation Control
TAC 28: I.Chapter 034	FP	State Fire Marshall Flammable Liquids
TAC 30: I.Chapter 025	CW, MR	Environmental Testing Laboratory Accreditation And Certification
TAC 30: I.Chapter 030	CW	Occupational Licenses And Registrations
TAC 30: I.Chapter 090	MR	Regulatory Flexibility
TAC 30: I.Chapter 101	CA	General Air Quality Rules
TAC 30: I.Chapter 106	CA	Permits By Rule
TAC 30: I.Chapter 111	CA	Control Of Air Pollution From Visible Emissions And Particulate Matter
TAC 30: I.Chapter 112	CA	Sulfur Compounds
TAC 30: I.Chapter 113	CA	Control Of Air Pollution From Toxic Materials
TAC 30: I.Chapter 114	CA	Control Of Air Pollution From Motor Vehicles
TAC 30: I.Chapter 115	CA	Control Of Air Pollution From Volatile Organic Compounds
TAC 30: I.Chapter 116	CA	Control Of Air Pollution By Permits For New Construction Or Modification
TAC 30: I.Chapter 117	CA	Control Of Air Pollution From Nitrogen Compounds

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
TAC 30: I.Chapter 118	CA	Control Of Air Pollution Episodes
TAC 30: I.Chapter 122	CA	Federal Operating Permits
TAC 30: I.Chapter 279	CW	Water Quality Certification
TAC 30: I.Chapter 281	CW	Applications Processing
TAC 30: I.Chapter 285	CW	On-Site Sewage Facilities
TAC 30: I.Chapter 290	CW	Public Drinking Water
TAC 30: I.Chapter 294	CW	Underground Water Management Areas
TAC 30: I.Chapter 295	CW	Water Rights, Procedural
TAC 30: I.Chapter 297	CW	Water Rights, Substantive
TAC 30: I.Chapter 307	CW	Texas Surface Water Quality Standards
TAC 30: I.Chapter 312	HW	Sludge Use, Disposal, And Transportation
TAC 30: I.Chapter 324	CW	Used Oil Standards
TAC 30: I.Chapter 327	CW	Spill Prevention And Control
TAC 30: I.Chapter 328	PP	Waste Minimization And Recycling
TAC 30: I.Chapter 330	PP	Municipal Solid Waste
TAC 30: I.Chapter 334	HW	Underground And Aboveground Storage Tanks
TAC 30: I.Chapter 335	HW	Industrial Solid Waste And Municipal Hazardous Waste
TAC 30: I.Chapter 336	RP	Radioactive Substances Rules
TAC 30: I.Chapter 339	CW	Groundwater Protection Recommendation Letters And Fees
TAC 31: I.Chapter 015	CW	Coastal Area Planning
TAC 31: I.Chapter 016	CW	Coastal Protection
TAC 31: I.Chapter 019	CW	Oil Spill Prevention And Response
TAC 31: I.Chapter 020	CW	Natural Resources Damage Assessment
TAC 31: II.Chapter 057	MR	Fisheries
TAC 31: II.Chapter 065	MR	Wildlife
TAC 31: II.Chapter 069	MR	Resource Protection
TAC 31: XVI.Chapter 501	CW	Coastal Management Program
No number	CA	Technical Guidance Package for Chemical Sources, Storage Tanks, TNRCC, Feb 1995
No number	CA	Technical Guidance Package for Chemical Sources, Equipment Leak Fugitives, TNRCC, Mar 1995
RS 30:2361-2379 SARA Title III	CS	Hazardous Materials Information Development, Preparedness and Response Act

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
RS 32:173	TS	Certain vehicles must stop at all railroad grade crossings (Explosives)
RS 32:251 Subpart J. Vehicles Transporting Explosives or Inflammables	TS	Permission for operation; crossing railroad grade crossings; markings
RS 32:252	TS	Equipment and inspection (Explosives)
RS 40:1472.3	IS	License; manufacturer-distributor, dealer, user, or blaster of explosives
RS 40:1472.4	IS	Possession without license prohibited; exceptions (Explosives)
RS 40:1472.7	IS	Reports of losses or thefts; illegal use or illegal possession (Explosives)
RS 40:1472.11	IS	Confiscation and disposal of explosives
RS 40:1472.12	IS	Unlawful storage of explosives
RS 40:1472.13	IS	Abandonment of explosives
RS 40:1472.18	IS	Careless use of explosives
RS 40:1472.19	IS	Reckless use of explosives
TCRA, 505-507 SARA Title III	CS	Texas Tier Two Reporting Forms and Instructions
TRCR part 11	RP	Texas Regulations for Control of Radiation - General provisions
TRCR part 12	RP	Texas Regulations for Control of Radiation - Fees
TRCR part 13	RP	Texas Regulations for Control of Radiation - Hearing and Enforcement Procedures
TRCR part 21	RP	Standards for Protection Against Radiation - Permissible Doses, Precautionary Procedures, Waste Disposal
TRCR part 22	RP	Notices, Instructions and Reports to Workers; Inspections
TRCR part 31	RP	Radiation Safety Requirements and Licensing and Registration Procedures for Industrial Radiography
TRCR part 41	RP	Licensing of Radioactive Material -Exemptions, Licenses, General Licenses, Specific Licenses, Reciprocity, Transport
ANSI Standards	IS	OSHA Referenced Standards
ANSI/ISO 14001-1996	MR	Environmental Management Systems Specification With Guidance For Use
ASME Standards	IS	OSHA Referenced Standards
Chapter 13 Jefferson Parish Code of Ordinances	FP	Fire Prevention and Protection; Emergency Services and Communication (Explosives)
Chapter 235 TX Statutes, Local Government, Title 7	IS	County Regulation of Matters Relating to Explosives and Weapons Subchapter A. Explosives

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
Chapter 417TX Statutes, Government, Council	FP	State Fire Marshall (Explosives)
Chapter 545 TX Statutes, Transportation, Title 7	TS	Operation and Movement of Vehicles (Explosives)
Chapter 547 TX Statutes, Transportation, Title 7	TS	Vehicle Equipment (Explosives)
EPA 453/R-93-026	CA	Protocol for Equipment Leak Emission Estimates, Jun 1993
EPA 530/R-93-001	CW	RCRA Groundwater Monitoring; Draft Technical Guidance
EPA 600/2-85/105	CW	Practical Guide for Groundwater Sampling
EPA 600/4-78-012	CW	Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms
EPA 600/4-79-019	CW	Handbook for Analytical Quality Control in Water and Wastewater Laboratories
EPA 600/4-79-020	CW	Methods for Chemical Analysis of Water and Wastes
EPA 600/4-82-029	CW	Handbook for Sampling and Sample Preservation of Water and Wastewater
EPA/600/4-83-039	CW	Addendum to Handbook for Sampling and Sample Preservation, EPA 600/4-82-029
EPA/600/8-78-017	CW	Microbiological Methods for Monitoring the Environment, Water and Wastes
EPA/600/R-92/088	PP	Facility Pollution Prevention Guide
EPA 833-R-92-002	PP	Storm Water Management for Industrial Activities
EPA, ISBN:0-86587-279-1	CW	EPA Groundwater Handbook
EPA, ISBN:0-86587-752-1	PP	EPA Waste Minimization Opportunity Assessment Manual
EPA Region IV	MR	Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual, 4/1/86
FAA AC 150/5345-27	IS	Specification for 8’ and 12’ Unlighted and Externally Lighted Wind Cone Assembly
FAA AC 150/5390-2	IS	Heliport Design, January 4, 1988
FAA AC 70/7460-1G	IS	Obstruction Marking and Lighting, October 1985
NFPA	FP	Fire Protection Handbook
NFPA 1	FP	Uniform Fire Code
NFPA 10	FP	Standard for Portable Fire Extinguishers
NFPA 11	FP	Standard for Low-, Medium-, and High-Expansion Foam Systems
NFPA 12	FP	Standard on Carbon Dioxide Extinguishing Systems
NFPA 12A	FP	Standard on Halon 1301 Fire Extinguishing Systems
NFPA 13	FP	Standard for the Installation of Sprinkler Systems
NFPA 14	FP	Standard for the Installation of Standpipe and Hose Systems

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
NFPA 15	FP	Standard for Water Spray Fixed Systems for Fire Protection
NFPA 16	FP	Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems
NFPA 20	FP	Standard for the Installation of Stationary Pumps for Fire Protection
NFPA 24	FP	Standard for the Installation of Private Fire Service Mains and Their Appurtenances
NFPA 25	FP	Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
NFPA 30	FP	Flammable and Combustible Liquids Code
NFPA 37	FP	Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
NFPA 45	FP	Standard on Fire Protection for Laboratories Using Chemicals
NFPA 51B	FP	Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 54	FP	National Fuel Gas Code
NFPA 55	FP	Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks
NFPA 70	FP, IS	National Electrical Code
NFPA 70B	FP	Recommended Practice for Electrical Equipment Maintenance
NFPA 70E	FP	Standard for Electrical Safety in the Workplace
NFPA 72	FP	National Fire Alarm Code
NFPA 75	FP	Standard for the Protection of Information Technology Equipment
NFPA 77	FP	Recommended Practice on Static Electricity
NFPA 80A	FP	Recommended Practice for Protection of Buildings from Exterior Fire Exposures
NFPA 90A	FP	Standard for the Installation of Air-Conditioning and Ventilating Systems
NFPA 92A	FP	Recommended Practice for Smoke-Control Systems
NFPA 96	FP	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
NFPA 101	FP, IS	Life Safety Code®
NFPA 101A	FP	Guide on Alternative Approaches to Life Safety
NFPA 110	FP	Standard for Emergency and Standby Power Systems
NFPA 122	FP	Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities
NFPA 170	FP	Standard for Fire Safety Symbols
NFPA 204	FP	Standard for Smoke and Heat Venting
NFPA 220	FP	Standard on Types of Building Construction
NFPA 221	FP	Standard for Fire Walls and Fire Barrier Walls

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
NFPA 232	FP	Standard for the Protection of Records
NFPA 241	FP	Standard for Safeguarding Construction, Alteration, and Demolition Operations
NFPA 253	FP	Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
NFPA 255	FP	Standard Method of Test of Surface Burning Characteristics of Building Materials
NFPA 291	FP	Recommended Practice for Fire Flow Testing and Marking of Hydrants
NFPA 302	FP	Fire Protection Standard for Pleasure and Commercial Motor Craft
NFPA 306	FP	Standard for the Control of Gas Hazards on Vessels
NFPA 307	FP	Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves
NFPA 326	FP	Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair
NFPA 329	FP	Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases
NFPA 385	FP	Standard for Tank Vehicles for Flammable and Combustible Liquids
NFPA 418	FP	Standard for Heliports
NFPA 430	FP	Code for the Storage of Liquid and Solid Oxidizers
NFPA 471	FP	Recommended Practice for Responding to Hazardous Materials Incidents
NFPA 472	FP	Standard for Professional Competence of Responders to Hazardous Materials Incidents
NFPA 495	FP	Explosive Materials Code
NFPA 505	FP	Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operation
NFPA 550	FP	Guide to the Fire Safety Concepts Tree
NFPA 600	FP	Standard on Industrial Fire Brigades
NFPA 601	FP	Standard for Security Services in Fire Loss Prevention
NFPA 703	FP	Standard for Fire Retardant Impregnated Wood and Fire Retardant Coatings and Building Materials
NFPA 704	FP	Standard System for the Identification of the Hazards of Materials for Emergency Response
NFPA 780	FP	Standard for the Installation of Lightning Protection Systems
NFPA 820	FP	Standard for Fire Protection in Wastewater Treatment and Collection Facilities
NFPA 901	FP	Standard Classifications for Incident Reporting and Fire Protection Data
NFPA 921	FP	Guide for Fire and Explosion Investigations
NFPA 1000	FP	Standard for Fire Service Professional Qualifications Accreditation and Certification Systems

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
NFPA 1021	FP	Standard for Fire Officer Professional Qualifications
NFPA 1031	FP	Standard for Professional Qualifications for Fire Inspector and Plan Examiner
NFPA 1033	FP	Standard for Professional Qualifications for Fire Investigator
NFPA 1401	FP	Recommended Practice for Fire Service Training Reports and Records
NFPA 1404	FP	Standard for Fire Service Respiratory Protection Training
NFPA 1410	FP	Standard on Training for Initial Emergency Scene Operations
NFPA 1500	FP	Standard on Fire Department Occupational Safety and Health Program
NFPA 1561	FP	Standard on Emergency Services Incident Management System
NFPA 1582	FP	Standard on Comprehensive Occupational Medical Program for Fire Departments
NFPA 1901	FP	Standard for Automotive Fire Apparatus
NFPA 1911	FP	Standard for Service Tests of Fire Pump Systems on Fire Apparatus
NFPA 1932	FP	Standard on Use, Maintenance, and Service Testing of In-Service Fire Department Ground Ladders
NFPA 1961	FP	Standard on Fire Hose
NFPA 1962	FP	Standard for the Inspection, Care and Use of Fire Hose, Couplings and Nozzles; and the Service Testing of Fire Hose
NFPA 1963	FP	Standard for Fire Hose Connections
NFPA 1964	FP	Standard for Spray Nozzles
NFPA 1971	FP	Standard on Protective Ensemble For Structural Fire Fighting
NFPA 1976	FP	Standard on Protective Ensemble for Proximity Fire Fighting
NFPA 1981	FP	Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services
NFPA 1983	FP	Standard on Fire Service Life Safety Rope and System Components
NFPA 1991	FP	Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies
NFPA 1992	FP	Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies
NFPA 1999	FP	Standard on Protective Clothing for Emergency Medical Operations
DOE/EH-0350	CA	Management of Polychlorinated Biphenyls (PCBs)
DOE/EH-0358	MR	Performance Objectives and Criteria for Conducting DOE Environmental Audits
DOE G 450.4-1B	MR	Integrated Safety Management System Guide, March 2001
DOE G 414.1-1A	MR	Management Assessment And Independent Assessment Guide, May 2001
DOE/EM-0276	PP	Annual report on Waste Generation and Waste Minimization Progress

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
DOE/EP-0108	FP	Standard for Fire Protection of DOE Electronic Computer/Data Processing Systems
DOE/FM-0145	PP	Waste Minimization/Pollution Prevention Crosscut Plan 1994
DOE Guideline	PP	DOE Waste Minimization reporting Requirements, Nov. 1994
DOE Handbook	PP	Guidance for the Preparation of the Waste Minimization and Pollution Prevention Awareness Plan, Dec 1993
DOE Handbook	PP	Pollution Prevention Handbook
DOE Handbook	PP	Waste Minimization Reporting System (Wmin) User's Guide
DOE HDBK, 1090-9	IS	Hoisting And Rigging Handbook
DOE Memorandum	PP	EPA's Interim Final Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program
DOE Orders	MO,MR	For all applicable DOE Orders See Contract No. DE-AC96-03PO92207 Applicable Standards List
SPRMO 220.2	MO	Observations report
DOE S-0118	PP	Pollution Prevention Program Plan
DOE-STD-1088-95	FP	Fire Protection for Relocatable Structures
DOE Standard Spec. 17900	PP	Paint Repair of Exterior Metal Surfaces
SPRPMO O 3790.1	MR	Employee Occupational Medical and Counseling Programs
No number	MO,MR	Environmental, Safety, and Health Management Plan (FY 1998 - FY 2002)
SEN-15-90	MR	National Environmental Policy Act
SEN-22-90	HW	DOE Policy on Signatures of RCRA Permit Applications
SEN-37-92	PP	Waste Minimization Crosscut Plan Implementation
AL 5500.11	MO,MR	Drill and Exercise Program Plan
ASE 5400.48	MR	Annual Site Environmental Report
ASI 3400.1	MO, MR	Conduct of Training for the SPR M&O Contractor
ASI 4000.10	FP	Integrated Logistics Support Procedures
ASI 4330.16	FP,IS	Work Order System Procedures
ASI 4400.4	PP	Supply Services Manual
ASI 5400.15	MR	Environmental Instructions Manual
ASI 5480.19	MO,MR	Conduct of Operations at the SPR
ASI 5480.22	IS	Accident Prevention Manual
ASI 5600.1	FP	Security Operations Manual
ASI 5700.11	IS	Root Cause Analysis Instruction
ASI 5700.15	MR	Quality Assurance Manual

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
ASI 6410.2	FP	Construction Management Procedures Manual
ASI 6430.15	MO,MR	Design Review Procedure
ASL 1000.15	MR	Self-Assessment Program Implementation Plan
ASL 4700.1	MO,MR	Configuration Management Plan and Procedures
ASL 5480.18	FP	Fire Protection Manual
ASL 5480.44	IS	Electrical Safety Program Plan
ASL 6400.30	CW	Cavern Inventory & Integrity Control Plan
ASL 5500.1	MO,MR	Emergency Management Plan
ASL 5500.10	MO,MR	Emergency Readiness Assurance Plan
ASL 5500.25	MO,MR	Emergency Response Team Organization and Training Plan
ASL 5500.58	EM, FP	Emergency Management Plan and Implementing Procedures
ASL 6400.18	MO,MR	Drawdown Management Plan
ASL 6400.31	MO,MR	Drawdown Readiness Program Plan
ASP 4000.11	FP	Integrated Logistics Support Master Plan
ASP 5000.8	MO,MR	Master Action Tracking Management and Control System
ASP 5400.2	MR	Environmental
ASR 4330.5	FP	Interim Repair/Mitigation Authorization
ASR 5480.49	MO,MR	Environmental, Safety and Health (ES&H) Orientation Video Program
ASR 5700.3	MO,MR	Independent Quality Assurance Assessments
ASR 5700.4	FP	Deviation and Waiver Requests
ASR 7000.1	MO,MR	Readiness Review Board
ASR 7000.2	MO,MR	SPR Crosstalk Information Exchange Program
BCL 5400.16	CW	Bayou Choctaw Spill Prevention, Control, and Countermeasures Plan
BCI 5500.3	EM, FP	Bayou Choctaw Emergency Response Procedures
BHL 5400.21	CW	Big Hill Spill Prevention, Control, and Countermeasures Plan
BHI 5500.4	EM, FP	Big Hill Emergency Response Procedures
BMI 6420.27	FP	Bryan Mound Foam Deluge System Interim Operations Manual
BML 5400.17	CW	Bryan Mound Spill Prevention, Control, and Countermeasures Plan
BMI 5500.5	EM, FP	Bryan Mound Emergency Response Procedures
D506-01162-02	FP	Bryan Mound: Preventive Maintenance Procedures Manual
D506-01163-03	FP	West Hackberry: Preventive Maintenance Procedures Manual

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
D506-01164-04	FP	Bayou Choctaw: Preventive Maintenance Procedures Manual
D506-01167-07	FP	St. James: Preventive Maintenance Procedures Manual
D506-01168-08	FP	Big Hill: Preventive Maintenance Procedures Manual
D506-02569-09	TSM, CS	Hazardous Materials Packaging & Transportation Plan
D506-03287-09	HW,PP,CW	Pollution Prevention Plan
MSL 7000.133	CW, HW	Laboratory Programs & Procedures
NOL 5400.44	CW	New Orleans Warehouse Spill Prevention, Control, and Countermeasures Plan
NOI 1000.72	MR	Organizational and Management Assessments
No number	CW,PP,CA, HW,CS	Environmental Exhibit 6.6
No number	CW	SPR Groundwater Protection Management Program
No number	PP,HW	SPR Qualified Products List
No number	MO, MR	SPRPMO Environmental, Safety and Health Manual
No number	MO, MR	SPRPMO Level III Design Criteria
WHL 5400.20	CW	West Hackberry Spill Prevention, Control, and Countermeasures Plan
WHI 5500.9	EM,FP	West Hackberry Emergency Response Procedures
120 IAC	IS	Boiler And Pressure Vessels - Degas Project Only
055-001-01049-4	CW	Quality Criteria for Water
ACGIH TLV	IH	Threshold Limit Values For Chemical Substances - Current Year & Applicable Substances
ACP USCG	CW	Area Contingency Plan for New Orleans
ACP USCG	CW	Area Contingency Plan for Lake Charles
ACP USCG	CW	Area Contingency Plan for Port Arthur
ACP USCG	CW	Area Contingency Plan for Galveston
ACP-EPA	CW	Area Contingency Plan for EPA Region 6
AIHMM	PP	Hazardous Materials Management Education Program Observations and Recommendations: Environmental Mgmt, Hazardous Waste Minimization, and Pollution Prevention for the SPR Operations
American Public Health Assoc.	CW	Standard Methods for the Examination of Water and Wastewater
AP-42	CA	Compilation of Air Pollutant Emission Factors, Mobile Sources
APC-S-2	CA	Permit Regulations for the Construction and/or Operation of Air Emissions Equipment (Mississippi)
API	MR	Amer. Petroleum Institute - Recommended Practices and Guides

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
API - Standard	CA	API Standard 653 for Tank Inspection, Repair, Alteration, and Reconstruction
AR 200-2	MR	Environmental Effects of Army Actions
CERI-89-224	CW	Seminar on Site Characterization for Subsurface Remediations
FM	FP	Factory Mutual - Approval Guide and Loss Prevention Data Sheets
HW-1	HW	Hazardous Waste Management Regulations (Mississippi)
ICIMF	IS	Oil Cos. International. Marine Forum - International Oil Tanker and Terminal Safety Guide
IEEE Standards	IS	OSHA Referenced Standards
LP 92-03	PP	Pollution Prevention Assessment Manual for Texas Businesses
LW-1	CW	Surface Water and Ground Water Use and Protection Regulations (Mississippi)
MIL-HDBK-1008	FP	Fire Protection for Facilities - Engineering, Design and Construction
MP 94W0000131	CA	SPR Gas and Geothermal Heat Effects on Crude Oil Vapor Pressure, Dec. 1994
NACE	FP, IS	National Association of Corrosion Engineers
NEC	FP, IS	National Electric Safety Code
No number	CW	Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook (LDOTD and LDEQ)
No number	CW	Earth Manual, 2nd Ed.
No number	CW	Engineering Geology Field Manual
No number	CW, CA	Environmental Monitoring Plan
No number	CW	Groundwater Manual
No number	CW	Groundwater Program
No number	CA	Louisiana Air Permit Procedures Manual, Jun 1995
No number	CW	Louisiana’s Suggested Chemical Weed Control Guide for 1994 (LA Cooperative Extension Services)
No number	CA	Nonattainment New Source Review Guidance Manual, Oct 1993
No number	CW	The Sterling Brine Handbook (Int’l Salt Co.)
No number	CW	Water Measurement Manual
OSWER-9950.1 (1986)	CW	RCRA Groundwater Technical Enforcement Guidance Document (TEGD)
RBCA (OS21)	CW	Proposed Approach for Implementing a Louisiana Dept. of Env. Quality Risk-Based Corrective Action Program
RG-133	PP	Pollution Prevention Assessment Manual
SW-2	HW	Nonhazardous Solid Waste Management Regulations and Criteria (Mississippi)
UFC/UBC	FP	International Conference of Building Officials - Uniform Building Code and Uniform Fire Code
UL	FP	Underwriter’s Laboratory - Building Materials, Fire Resistance, Fire Prot. Equip., & Haz. Location Equip. Directories

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

STANDARD	AREA	DESCRIPTION
Water Supply Paper 1473	CW	Study and Interpretation of the Chemical Characteristics of Natural Water (HEM)
Y-87-1	CW	Corps. of Engineers Wetlands Delineation Manual
No number	MR	Membership in Clean Texas, Cleaner World Program http://www.cleantexas.org/index.cfm
No number	MR	Membership in EPA National Environmental Performance Track Program http://www.epa.gov/performancetrack/program/index.htm
No number	MR	Membership in Louisiana Environmental Leadership Program (LaELP) http://www.deq.state.la.us/assistance/elp

STRATEGIC PETROLEUM RESERVE - DM ES&H STANDARDS

KEY TO ACRONYMS:

AIHMM	American Institute of Hazardous Materials Mgmt.
API	American Petroleum Institute
CA	Protection of Air Quality
CFR	Code of Federal Regulations
CS	Control of Toxic Substances
CW	Protection of Water Quality
EO	Executive Order
ESH	Environmental, Safety, and Health Directorate
FM	Factory Mutual
FP	Fire Protection
HW	Solid and Hazardous Waste Generation and Control
IH	Industrial Hygiene
IS	Industrial Safety
LAC	Louisiana Administrative Code
M	Manual (DOE)
MO	Management and Oversight
MR	Management, Oversight, and Reporting
MS	Medical Services
NEC	National Electric Code
NFPA	National Fire Protection Association
O	Order (DOE)
P	Policy (DOE)
PP	Pollution Prevention and Waste Minimization
RCRA	Resource Conservation and Recovery Act
RP	Radiation Protection
SEN	Secretary of Energy Notice
TAC	Texas Administrative Code
TRCR	Texas Regulations for the Control of Radiation
TS	Transportation Safety
UBC	Uniform Building Code
UFC	Uniform Fire Code
UL	Underwriter's Laboratory

Appendix A-1
SPRPMO ES&H Directives

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SPRPMO ES&H Directives

Directive	Description
DOE O 151.1A	Comprehensive Emergency Management System
DOE O 225.1A	Accident Investigations
DOE O 231.1 Change 2	Environment, Safety and Health Reporting
DOE O 232.1A	Occurrence Reporting and Processing of Operations Information
DOE O 420.1 Change 1-3	Facility Safety
DOE O 430.1A	Life-Cycle Asset Management
DOE O 430.2A	Departmental Energy and Utilities Management
DOE O 440.1A	Worker Protection Management for DOE Federal and Contractor Employees
DOE O 440.2A	Aviation Management Safety
DOE O 451.1B Change 1	National Environmental Policy Act Compliance Program
DOE O 460.1A	Packaging and Transportation Safety
DOE O 460.2 Change 1	Departmental Materials Transportation and Packaging Management
DOE 1300.3	Policy on the Protection of Human Subjects
DOE O 450.1 Change 1	General Environmental Program
DOE 5400.5 Change 1&2	Radiation Protection of the Public and the Environment
DOE 5480.4 Change 1-4	Environmental Protection, Safety, and Health Protection Standards
DOE 5480.19 Change 1	Conduct of Operations Requirements for DOE Facilities
DOE 5480.22 Change 1&2	Technical Safety Requirements
DOE 5530.1A	Accident Response Group
DOE 6430.1A	General Design Criteria
DOE M 232.1-1A	Occurrence Reporting and Processing of Operations Information
DOE M 440.1-1	DOE Explosives Manual

SPRPMO ES&H Directives

Directive	Description
DOE P 411.1	Safety Management Functions, Responsibilities, and Authorities Policy
DOE P 441.1	DOE Radiological Health and Safety Policy
DOE P 450.1	Environment, Safety and Health Policy for the DOE Complex
DOE P 450.2 A	Identifying, Implementing, and Complying with ES&H Requirements
DOE P 450.3	Authorizing Use of the Necessary and Sufficient Process For Standards based ES&H
DOE P 450.4	Safety Management System Policy
DOE P 450.5	Line Environment, Safety, and Health Oversight
DOE P 450.6	Secretarial, Policy Statement Environmental, Safety, and Health

Appendix B
SPR Environmental Policy

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U. S. Department of Energy
STRATEGIC PETROLEUM RESERVE PROJECT MANAGEMENT OFFICE
New Orleans, La.

POLICY

SPRPMO P 451.1A

APPROVED: 07-15-05
REVIEW DATE: 07-15-06

SUBJECT: ENVIRONMENTAL POLICY STATEMENT

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1. **PURPOSE AND SCOPE.** The purpose of this Environmental Policy Statement is to confirm the commitment of the Department of Energy (DOE) Strategic Petroleum Reserve Project Management Office (SPRPMO) to the goal of environmental protection for all PMO activities, including management and oversight of contractors, and decision-making for concept, design, development, construction, operations, and decommissioning.

2. **POLICY.** It is the policy and practice of the SPRPMO, as an operating unit of DOE, to conduct its operations in an environmentally sound manner. Protection of the environment and protection of the public are responsibilities that are of paramount importance to our facilities and their environmental programs.

   The SPRPMO top management establishes the Environmental Management System (EMS) to implement this policy, including the following:

   a. **Regulatory Compliance** with applicable Federal, state, and local environmental legal, regulatory, and other requirements that relate to the environmental aspects of the SPRPMO.

   b. **Pollution Prevention** to undertake appropriate measures to prevent the generation of wastes, and other residual materials requiring disposal or release to the environment through recycling, reuse, and source reduction. Where the generation of such wastes cannot be avoided, the SPRPMO will take actions to reduce their volume and toxicity and ensure proper disposal.

   c. **Continual Improvement** of the EMS and environmental performance, as appropriate, by establishing and maintaining documented environmental objectives and targets.

   Our EMS strengthens environmental accountability in the decision-making process and is designed to comply with DOE Order 450.1, Environmental Protection Program; and the principles of the International Organization for Standardization, ISO 14001, *Environmental Management Systems – Specification with Guidance for Use* (2004). The SPRPMO's EMS provides a formal, organized process to plan, perform, assess, and improve environmental performance.

DISTRIBUTION: All SPRPMO Employees INITIATED BY: APM, Technical Assurance

We will communicate this policy to all DOE employees and all other persons working for or on behalf of the DOE at the SPR, make it available to the public, and maintain procedures to receive and respond to inquiries from external interested parties. This policy will be reviewed periodically and revised to reflect changing conditions and information. The policy provides the framework for setting and reviewing environmental objectives and targets.

We will also be an **environmentally responsible neighbor** in the communities where we operate and act quickly and responsibly to correct incidents or conditions that endanger health, safety, or the environment, report them to authorities promptly, and inform everyone who may be affected by them. We will minimize harm to endangered species and their habitats, ecologically sensitive areas, and cultural resources, and will strive to conserve energy and natural resources.

DOE Management and Operating, Construction Management, Architect-Engineering (A&E) and other contractors also share our responsibilities for good environmental management. We expect our contractors to conduct facility operations in an environmentally sound manner that limits the risk to the environment and protects the public health.

We will work cooperatively and openly with the appropriate Federal, state, and local agencies, public stakeholders, and site employees to prevent pollution, ensure environmental compliance, and enhance environmental quality.

It is our goal to design, develop, construct, operate, and maintain facilities and operations in a manner that shall be resource-efficient and will protect the quality of the environment consistent with our mission.

William C. Gibson, Jr.

William C. Gibson, Jr.
Project Manager
Strategic Petroleum Reserve

1 Attachment:
Attachment 1, Contractor Requirements Document

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SPRPMO P 451.1A Attachment 1
07-15-05

CONTRACTOR REQUIREMENTS DOCUMENT

The Strategic Petroleum Reserve (SPR) contractors shall comply with the requirements of SPRPMO P 451.1A, including:

1. Conduct operations in an environmentally sound manner.
2. Implement the SPRPMO's environmental policy, including the following:
   a. **Regulatory Compliance** with applicable Federal, state, and local environmental legal, regulatory, and other requirements that relate to the environmental aspects of the SPRPMO.
   b. **Pollution Prevention** to undertake appropriate measures to prevent the generation of wastes, and other residual materials requiring disposal or release to the environment through recycling, reuse, and source reduction. Where the generation of such wastes cannot be avoided, take actions to reduce their volume and toxicity and ensure proper disposal.
   c. **Continual Improvement** of environmental performance, as appropriate, by establishing and maintaining documented environmental objectives and targets.
3. Communicate this policy to all contractor and sub-contractor employees.
4. Be an **environmentally responsible neighbor** in the communities where the SPR operates and act quickly and responsibly to correct incidents or conditions that endanger health, safety, or the environment, report them to authorities promptly, and inform everyone who may be affected by them.
5. Minimize harm to endangered species and their habitats, ecologically sensitive areas, and cultural resources, and strive to conserve energy and natural resources.
6. Work cooperatively and openly with the appropriate Federal, state, and local agencies, public stakeholders, and site employees to prevent pollution, ensure environmental compliance, and enhance environmental quality.

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POLICY

DynMcDermott Petroleum Operations Company

RESPONSIBLE FUNCTION:	SUPERSEDES:	POLICY NO: ASP5400.2
RESPONSIBLE FUNCTION: ENVIRONMENTAL **AUTHOR:** MICHAEL HUFF EMS Specialist **OWNER:** KIRKLAND JONES ES&H Director	**SUPERSEDES:** ASP5400.2, J0, "ENVIRONMENTAL POLICY" **APPROVED BY:** See E-Mail Approval R. MCGOUGH, PROJECT MANAGER	**POLICY NO: ASP5400.2** **VERSION: K1** **PAGE 4**

TITLE: ENVIRONMENTAL POLICY

Effective Date: 12/20/05

Policy Statement: **DynMcDermott operates only in an environmentally responsible manner.**

Functional Oversight: The Environmental Department is responsible for the annual review and update of this policy.

DynMcDermott Petroleum Operations Company (DM) is committed to continued excellence, leadership, and stewardship in protecting the environment through its environmental management system (EMS). DM will manage, operate, and maintain the Strategic Petroleum Reserve (SPR) sites with the highest regard for the protection of human health and the environment within the confines of the SPR sites and the community. Top management considers this commitment, as well as the commitment to compliance and continual improvement, essential to DM's operation of the SPR.

A. **Scope.** DM manages the transport and storage of crude oil in an environmentally safe and sound manner for the U.S. Department of Energy's Strategic Petroleum Reserve. This environmental policy and DM's environmental management system applies to four Gulf Coast underground salt dome oil storage facilities (two in Louisiana and two in Texas) that hold over 700 million barrels of crude oil, off-site crude oil, brine, and raw water pipelines, a leased warehouse that provides space for heavy equipment storage and as-needed office activities at the Stennis Space Center (near Picayune, Mississippi), and a project management facility, or headquarters (in New Orleans, Louisiana) with a nearby small warehouse. While DM does not own these capital assets, it is responsible for their management and operation under its contract with DOE. DM also oversees its subcontracted activities, maintains specified DOE facilities, and provides technical assistance to DOE in the oversight of their subcontracted construction activities.

Significant negative environmental impacts recognized with SPR activities include the potential for contamination of water (surface and groundwater), soil, and air; waste generation; and damage to biota. Significant positive environmental impacts result from environmental awareness, environmental protection, and emergency response.

B. **Line Responsibility.** Environmental protection is a line responsibility and the responsibility of every DM employee and person who works on behalf of DM. This policy is communicated to all DM employees, and environmental protection is an important measure of employee performance. DM Subcontractors and others who work on behalf of DM are furnished pertinent policy information as it relates to specific activities, products, and services they provide.

C. **Policy Commitments.** In keeping with this policy and the nature and scale of SPR activities and their impact on the environment, DM pledges, through excellence in environmental management, to:

- comply with applicable legal and other requirements to which we subscribe which relate to our environmental aspects
- prevent pollution through processes, practices, techniques, materials, products and services so that detrimental environmental impact is reduced
- continually improve our overall environmental performance through enhancing our environmental management system.

DM incorporates these commitments, from top management down, in all phases of its activities, including concept, design, development, construction, operations, and decommissioning. DM fully complies with federal, state, and local environmental laws, regulations, statutes, and permits, and with other requirements including the Department of Energy (DOE), industry, and internal environmental standards, as applicable.

Prevention of pollution has been and continues to be a core consideration in process design and operations and is viewed by management as a fundamental activity, as are safety and loss prevention. It is accomplished as practicable through 1) source reduction or elimination, 2) changes in processes, products, and services, 3) efficient use of resources, 4) material and energy substitution, and 5) reuse, recovery, recycling, reclamation, or treatment. DM strives to continually improve processes and systems through decision-making, implementation, and training.

DM also commits to local community environmental outreach through establishing, supporting, or sponsoring local environmental partnerships, programs, or projects that meet local needs.

D. **Environmental Impacts, Aspects, Objectives, and Targets.** Significant environmental impacts of SPR activities are controlled through recognizing the environmental aspects related to these impacts and setting and achieving environmental objectives and targets to protect the environment. Objectives and targets are consistent with this policy. They are based on specific Work Authorization Directives (a part of the DOE/DM contract), legal and other environmental requirements that DM subscribes to, significant environmental aspects; technological options; financial, operational, and business considerations; and the views of interested parties. Objectives and targets are set annually and evaluated at least annually to measure environmental performance and facilitate continual improvement.

E. Policy and EMS Information Availability. This policy is available to the public on request, on the DM internet website (www.dynmcdermott.com), and from the SPR Site Environmental Report, which is published and distributed annually (see - http://www.spr.doe.gov/esh/Default.htm). Information about DM's environmental performance and the operation of the EMS is shared with the community and other external interested parties on request and through local public meetings, site newsletters, the Site Environmental Report, the DM Environmental Advisory Committee, and pollution prevention advocacy groups in Louisiana and Texas.

F. Review and Approval. This policy is reviewed annually by the Management Review Team and approved by the project manager. It is revised, as necessary, in response to changing conditions, EMS audit results, and the commitment to continual improvement.

Version History – Significant Changes		
Version	Description	Effective Date
K1	Minor revisions include deletion of “Draft” from header on pages 2 through 4 of the document and addition of effective date for K0 on this version history table. No significant content changes were made. Revision bars from the K0 version were left in this version.	12/20/05
K0	Policy was revised to support requirements of the ISO 14001:2004 Standard.	12/02/05
J0	Policy was re-formatted in accordance with the DM Document Control and Management Program. Functional oversight for the policy was added. The policy is now more accessible to the Public through the DM website (added web address in paragraph D).	12/15/04
I0	Added wording that more explicitly states that DM will be involved in community environmental outreach in section B. Revision bars in the right margin mark the changed paragraphs.	12/05/03
H0	Added wording that more clearly states: top management's commitment to compliance and continual improvement (see B below), the framework for establishing and reviewing objectives and targets (C), and requirements for revision of the policy (E). Revision bars in the right margin mark the changed paragraphs.	11/11/02
G0	Deleted specific responsibilities from this document and revised to contain only policy information. The deleted information is covered in other documents.	11/29/01

Version History – Significant Changes		
Version	Description	Effective Date
F0	Changed “ES&H’ to “ES&Q”. Deleted section 4.J, Quality Assurance, and moved 4.J.[1] under 4.B, ES&Q Director. Changed the term “independent assessment” under 4.J.[1] to “management appraisal”. Deleted section 4.M., Information Systems. Other minor changes were made to sentence structure. Changed paragraphs are marked with a revision bar in the right margin.	5/01/01
E0	Combined subsections 3.3.B and 3.3.C into a single paragraph entitled Prevention of Pollution and added the words “prevent pollution” to 3.2. Expanded wording in 3.3.D., Compliance, regarding other requirements. In section 4, responsibilities, added environmental management system representative and general responsibilities. Changed paragraphs are marked with a revision bar in the right margin.	4/28/00
D0	Added the following policy statement “DynMcDermott operates only in an environmentally responsible manner.” (3.1) Added 4.C.[1]h. which states that the environmental manager will “assign a person to fill the role of environmental management system coordinator.” Changed paragraphs are marked with a revision bar in the right margin.	2/10/00
C0	Completely revised in a new format. Revised the reference list. Incorporated material to conform to the ISO 14001 standard. Incorporated policy on waste management in section 3. Added project manager responsibilities. Added environmental manager responsibility. Added Human Resources and Development and Information Systems responsibilities. Added responsibilities of managers and employees. Changed paragraphs are marked with a revision bar in the right margin.	7/27/98
B0	Annual review with no changes. Version not documented.	1997 Date unknown.
A0	New document. Version not documented.	5/3/96

END OF DOCUMENT

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DISTRIBUTION

This report is distributed widely by the Department of Energy's Strategic Petroleum Reserve Project Management Office to local, state, and federal government agencies, the Congress, the public, and the news media.