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MAJOR MODIFICATION Application Volumes I & II

June 11, 2009

STATE OF NEW MEXICO
DIRECTOR OF OIL CONSERVATION DIVISION

IN THE MATTER OF THE APPLICATION OF BASIN DISPOSAL, INC. FOR A SURFACE WASTE MANAGEMENT FACILITY PERMIT

RECEIVED
JUN 11 2009
Environmental Bureau
Oil Conservation Division

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OCD Permit # NM-01-0005

DECEMBER 2008
(Updated June 2009)

VOLUME I: PERMIT APPLICATION TEXT

VOLUME II: FACILITY MANAGEMENT PLANS

Prepared For:

Basin Disposal, Inc.
200 Montana Street
Bloomfield, NM 87413
(505) 632-8936

Submitted To:

New Mexico Energy, Minerals, and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505
(505) 476-3440

Prepared By:

Gordon Environmental, Inc.
213 South Camino del Pueblo
Bernalillo, NM 87004
(505) 867-6990

BASIN DISPOSAL, INC.
"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"
P.O. BOX 100 - AZTEC, NEW MEXICO 87410 - PHONE: (505) 334-3013

December 10, 2008
(Updated June 10, 2009)

RECEIVED
JUN 11 2009
Environmental Bureau
Oil Conservation Division

Mr. Edward Hansen
Hydrologist
Oil Conservation Division
NM Energy, Minerals and Natural
Resources Department
1220 South St. Francis Dr.
Santa Fe, NM 87505

Re: Basin, Disposal, Inc. [520.01.01/01]
Application for Permit Modification

Dear Mr. Price,

Basin Disposal, Inc. (BDI) is pleased to submit this Application for Permit Modification (the Application) to the Oil Conservation Division (OCD). This Application addresses the requirements of the Part 36 "Surface Waste Management Facility" standards (i.e., §19.15.36.1 - §19.15.36.20) that are applicable to BDI operations. Detailed engineering designs and supporting documentation are provided for two new evaporation ponds, approximately 4 acres each. To facilitate your review, the Application is organized consistent with the new regulatory requirements, and is subdivided into four Volumes provided in two binders:

Volume I: Application Text
Volume II: Facility Management Plans
Volume III: Engineering Design and Calculations
Volume IV: Siting and Hydrogeology

Permit Plans, sealed by a New Mexico Professional Engineer, are provided as a separate 24" x 36" Plan Set; and are also included in 11" x 17" format with Volume III. The Application is also furnished to OCD electronically on a CD disk in PDF format. Also included with this transmittal is a design memorandum (12/10/08) that discusses pond storage volumes specific to the geometry used for the BDI site improvements.

BASIN DISPOSAL, INC.
"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"
P.O. BOX 100 - AZTEC, NEW MEXICO 87410 - PHONE: (505) 334-3013

Gordon Environmental, Inc. (GEI) and Jordan Engineering, Inc. (JEI) are authorized by BDI to communicate with OCD regarding the Application; and to respond to your questions and comments. We look forward to working with you and the Division on the review and approval of the Application for Permit Modifications.

Very truly yours,

Basin Disposal, Inc.

John Volkerding, PhD
General Manager

cc: I. Keith Gordon, P.E.; GEI
Jim Jordan, P.E.; JEI

Attachments:

Application for Modification (2 Binders)
Plan Set (24' x 36", 8 Sheets)
Electronic Copy (CD Disk)

CERTIFICATION OF APPLICATION

The Permit Application submitted for the Basin Disposal, Inc. Oil Field Waste Evaporation Ponds located in San Juan County, New Mexico, was prepared by me and technical staff under my direct supervision. I provided input and review to each of the consultants responsible for the preparation of the other technical reports. I certify that, to the best of my knowledge and belief, the information contained herein is accurate, and that the Permit Application complies with the current New Mexico Energy, Minerals, Natural Resources Department, Oil Conservation Division Regulations (19.15.36 NMAC). I am a registered professional engineer in good standing in the State of New Mexico practicing under License No. 10984.

I. Keith Gordon
New Mexico P.E. No. 10984

I. KEITH GORDON
NEW MEXICO
10984
12/10/08
REGISTERED PROFESSIONAL ENGINEER

SIGNATURE AND VERIFICATION

STATE OF NEW MEXICO)
)
COUNTY OF SAN JUAN)

I, John Volkerding, being first duty sworn, state that I am the General Manager of Basin Disposal, Inc. that I have read the foregoing Application for Permit including the contents of any exhibits, and the same is true and correct to the best of my knowledge and belief.

John Volkerding, PhD
Basin Disposal, Inc.

Subscribed and sworn to before me this 24th day of October 2008.

Notary Public Dora Haston

My Commission Expires 6/30/10

OFFICIAL SEAL
Dora Haston
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 6/30/10

STATE OF NEW MEXICO
DIRECTOR OF OIL CONSERVATION DIVISION

IN THE MATTER OF THE APPLICATION OF BASIN DISPOSAL, INC. FOR A SURFACE WASTE MANAGEMENT FACILITY PERMIT §

RECEIVED
JUN 11 2009
Environmental Bureau
Oil Conservation Division

APPLICATION FOR PERMIT

I. Keith Gordon, P.E.
Gordon Environmental, Inc.
213 South Camino del Pueblo
Bernalillo, New Mexico 87004
(505) 867-6990
Environmental Consultant to and
Representative of
Basin Disposal, Inc.
200 Montana Street
Bloomfield, NM 87413
(505) 632-8936
Applicant

CERTIFICATION OF SERVICE

I hereby certify that a copy of the foregoing Application for Permit was hand-delivered to the following party of record on _____, 2009

Oil Conservation Division
NM Energy, Minerals, and Natural Resources Dept.
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

_____
(Signature of person receiving copy)

_____
(Name of signer)

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

For State Use Only:

Form C-137
Revised March 1, 2007

Submit 1 Copy to Santa Fe Office

APPLICATION FOR SURFACE WASTE MANAGEMENT FACILITY

A meeting should be scheduled with the Division's Santa Fe office Environmental Bureau prior to pursuing an application for a surface waste management facility in order to determine if the proposed location is capable of satisfying the siting requirements of Subsections A and B of 19.15.36.13 NMAC for consideration of an application submittal.

1 Application: ☐ New ☑ Modification ☐ Renewal

2. Type: ☑ Evaporation ☐ Injection ☐ Treating Plant ☐ Landfill ☐ Landfarm ☐ Other

3. Facility Status: ☑ Commercial ☐ Centralized

4. Operator: Basin Disposal, Inc.

Address: 200 Montana Street, Bloomfield, NM 87413

Contact Person: Mr. John Volkerding, PhD, General Manager Phone: 505-334-3013

5. Location: NW 1 /4 /4 Section 3 Township 29 N Range 11 W

6. Is this an existing facility? ☑ Yes ☐ No If yes, provide permit number NM-01-0005

7. Attach the names and addresses of the applicant and principal officers and owners of 25 percent or more of the applicant. Specify the office held by each officer and identify the individual(s) primary responsible for overseeing management of the facility.

19.15.36.8.C.(1)

8. Attach a plat and topographic map showing the surface waste management facility's location in relation to governmental surveys (quarter-quarter section, township and range); highways or roads giving access to the surface waste management facility site; watercourses; fresh water sources, including wells and springs; and inhabited buildings within one mile of the site's perimeter.

19.15.36.8.C.(2); Volume IV, Section 1, Siting Criteria

9. Attach the names and addresses of the surface owners of the real property on which the surface waste management facility is sited and surface owners of the real property within one mile of the site's perimeter.

19.15.36.8.C.(3); Volume I, Attachment B

10. Attach a description of the surface waste management facility with a diagram indicating the location of fences and cattle guards, and detailed construction/installation diagrams of pits, liners, dikes, piping, sprayers, tanks, roads, fences, gates, berms, pipelines crossing the surface waste management facility, buildings and chemical storage areas.

19.15.36.8.C.(4); Volume III, Section 1, Engineering Design

11. Attach engineering designs, certified by a registered professional engineer, including technical data on the design elements of each applicable treatment, remediation and disposal method and detailed designs of surface impoundments.

19.16.36.8.C.(5); Volume III, Section 1, Engineering Design

12. Attach a plan for management of approved oil field wastes that complies with the applicable requirements contained in 19.15.36.13, 19.15.36.14, 19.15.36.15 and 19.15.36.17 NMAC.

19.15.36.8.C.(6); Volume II, Section 2, Oil Field Waste Management Plan

13. Attach an inspection and maintenance plan that complies with the requirements contained in Subsection L of 19.15.36.13 NMAC.

19.15.36.8.C.(7); Volume II, Section 1, Operations, Maintenance, and Inspection Plan

14. Attach a hydrogen sulfide prevention and contingency plan that complies with those provisions of 19.15.3.118 NMAC that apply to surface waste management facilities.

19.15.36.8.C.(8); Volume II, Section 3, Hydrogen Sulfide (H2S) Prevention Plan

15. Attach a closure and post closure plan, including a responsible third party contractor's cost estimate, sufficient to close the surface waste management facility in a manner that will protect fresh water, public health, safety and the environment (the closure and post closure plan shall comply with the requirements contained in Subsection D of 19.15.36.18 NMAC).

19.15.36.8.C.(9); Volume II, Section 4, Closure/Post-closure (C/PC) Plan)

16 Attach a contingency plan that complies with the requirements of Subsection N of 19.15.36.13 NMAC and with NMSA 1978, Sections 12-12-1 through 12-12-30, as amended (the Emergency Management Act).

19.15.36.8.C.(10); Volume II, Section 6, Contingency Plan

17. Attach a plan to control run-on water onto the site and run-off water from the site that complies with the requirements of Subsection M of 19.15.36.13 NMAC.

19.15.36.8.C.(11); Volume III, Section 1, Engineering Design

18. In the case of an application to permit a new or expanded landfill, attach a leachate management plan that describes the anticipated amount of leachate that will be generated and the leachate's handling, storage, treatment and disposal, including final post closure options.

19.15.36.8.C.(12) - NA

19. In the case of an application to permit a new or expanded landfill, attach a gas safety management plan that complies with the requirements of Subsection O of 19.15.36.13 NMAC

19.15.36.8.C.(13) - NA

20. Attach a best management practice plan to ensure protection of fresh water, public health, safety and the environment.

19.15.36.8.C.(14); Volume II, Section 1, Operations, Maintenance, and Inspection Plan

21. Attach a demonstration of compliance with the siting requirements of Subsections A and B of 19.15.36.13 NMAC.

Volume IV, Siting and Hydrogeology

22. Attach geological/hydrological data including:

(a) a map showing names and location of streams, springs or other watercourses, and water wells within one mile of the site;

(b) laboratory analyses, performed by an independent commercial laboratory, for major cations and anions; benzene, toluene, ethyl benzene and xylenes (BTEX); RCRA metals; and total dissolved solids (TDS) of ground water samples of the shallowest fresh water aquifer beneath the proposed site;

(c) depth to, formation name, type and thickness of the shallowest fresh water aquifer;

(d) soil types beneath the proposed surface waste management facility, including a lithologic description of soil and rock members from ground surface down to the top of the shallowest fresh water aquifer;

(e) geologic cross-sections;

(f) potentiometric maps for the shallowest fresh water aquifer; and

(g) porosity, permeability, conductivity, compaction ratios and swelling characteristics for the sediments on which the contaminated soils will be placed.

19.15.36.8.C.(15); Volume IV, Section 2, Hydrogeology

23. In the case of an existing surface waste management facility applying for a minor modification, describe the proposed change and identify information that has changed from the last C-137 filing.

19.15.36.8.D

24. The division may require additional information to demonstrate that the surface waste management facility's operation will not adversely impact fresh water, public health, safety or the environment and that the surface waste management facility will comply with division rules and orders

19.15.36.8.C.(17)

25. CERTIFICATION

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name: John Volkerding, PhD Title: General Manager

Signature: Date: 6/10/09

E-mail Address: bdinc@digii.net

Note: Text provided in Bold Italic format references the corresponding section in the Application for Modification.

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

TABLE OF CONTENTS

STATE OF NEW MEXICO
DIRECTOR OF OIL CONSERVATION DIVISION

IN THE MATTER OF THE APPLICATION OF BASIN DISPOSAL, INC. FOR A SURFACE WASTE MANAGEMENT FACILITY PERMIT

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OCD Permit # NM-01-0005

DECEMBER 2008
(Updated June 2009)

VOLUME I:
PERMIT APPLICATION TEXT

Prepared For:

Basin Disposal, Inc.
200 Montana Street
Bloomfield, NM 87413
(505) 632-8936

Submitted To:

New Mexico Energy, Minerals, and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505
(505) 476-3440

Prepared By:

Gordon Environmental, Inc.
213 South Camino del Pueblo
Bernalillo, NM 87004
(505) 867-6990

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME I: PERMIT APPLICATION TEXT
PART 36: SURFACE WASTE MANAGEMENT FACILITIES

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Table 1
Basin Disposal, Inc.

List of Acronyms and Definitions

ASTM	***American Society for Testing and Materials***
BBL	***Barrels;*** 42 gallons (oil)
BDI	***Basin Disposal, Inc.***
BTEX	***Benzene, Toluene, Ethylbenzene, and Xylenes***
C/PC	***Closure/Post-Closure:*** C/PC refers to two independent steps following completion of facility operations: • Closure typically refers to regrading the surface and repositioning of infrastructure to accommodate the post-closure. • Post-closure care refers to maintenance and monitoring after completion of closure.
CQA	***Construction Quality Assurance:*** CQA is the process of applying field and laboratory testing, and construction observation to confirm that environmental control systems (e.g., liners and covers) are installed according to the design, regulatory requirements, and current industry standards.
FEMA	***Federal Emergency Management Agency,*** which administers the Flood Insurance Rate Map (FIRM) program.
FML	***Flexible Membrane Liner (or geomembrane):*** Geosynthetic plastic liners are the standard design for solid and liquid waste containment facilities.
GCL	***Geosynthetic Clay Liner*** These are composite materials with geotextiles (fabrics) used in conjunction with dense bentonite clays, and are commonly used as the secondary lower layer (i.e., beneath the FML) in the liner system.
H_2S	***Hydrogen Sulfide***
HDPE	***High Density Polyethylene:*** This geomembrane (plastic) is the preferred FML material for waste containment liners, and is typically installed in 40 – 100 mil thicknesses. HDPE is also used for leak detection and pipe systems.
LEL	***Lower Explosive Limit*** is the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 77 degrees Fahrenheit and atmospheric pressure.
mg/l	***Milligrams Per Liter***
NMAC	***New Mexico Administrative Code***

NMPM	***New Mexico Principal Meridian***
NOI	***Notice of Intent:*** Application to USEPA for stormwater discharges associated with industrial activity under the NPDES program. ***Notice of Inspection:*** The written record of a compliance inspection by a regulatory agency.
NORM	***Naturally Occurring Radioactive Material***
NPDES	***National Pollutant Discharge Elimination System:*** The federal permit program which requires all point sources discharging pollutants to waters of the United States to obtain a permit.
NRCS	***Natural Resources Conservation Service:*** The federal agency with local offices that provide guidance on seeding of the final cover.
OCD	***Oil Conservation Division;*** a division of the New Mexico Energy, Minerals, and Natural Resources Department
OSE	***Office of the State Engineer***
PE	***Professional Engineer***
PVC	***Polyvinyl Chloride***
RAI	***Request for Additional Information;*** typically issued by a regulatory agency to an Applicant in response to an Application.
RCRA	***Resource Conservation and Recovery Act;*** the program administered by USEPA that sets national standards for solid waste management and disposal.
TDS	***Total Dissolved Solids;*** a measure of water quality
TPH	***Total Petroleum Hydrocarbons***
USEPA	***United States Environmental Protection Agency:*** The federal entity responsible for administering the RCRA program. USEPA also sets national standards for air quality (NSPS) and stormwater quality (NPDES) protection.
USGS	***United State Geological Survey***
µm	***Micrometers***
UV	***Ultra-violet light;*** one component of sunlight
WQCC or (NMWQCC)	***Water Quality Control Commission;*** responsible for the protection of groundwater and surface water in New Mexico.

1.0 INTRODUCTION

Basin Disposal, Inc. (BDI) is submitting this Application for Modification (Application) for the BDI surface waste management facility (the "Facility"). This Application includes the following existing and proposed surface waste management components on 28 ± acres:

- Existing Pond # 1
- 12 existing receiving tanks
- 3 oily water receiving tanks
- 3 existing skimmed oil tanks
- 3 existing oil heating tanks
- 2 existing sludge settling tanks
- 7 oil sales tanks
- 3 existing filtered water tanks
- 4 existing bleach tanks
- 2 existing sludge pit and sumps
- 1 existing injection well
- Various support facilities including office, maintenance building, roads, and detention basin
- Proposed Ponds #2 and #3
- 6 additional proposed receiving tanks
- 2 additional proposed oil sales tanks

1.1 Site Description

BDI is located on 28 acres ± entirely within Section 3, Township 29 North, Range 11 west approximately 3 miles north of the intersection of Highway 550 and 64 (**Figure 1**). The site is situated about 4 miles north of the San Juan River, and about 6 miles south of the Animas River on Crouch Mesa, about 500 feet and 400 feet above the respective river plains. The site occupies the West Fork of Bloomfield Canyon, an ephemeral drainage the drains south to the San Juan River; the site slopes gently to the east and southeast, from a maximum elevation of 5,750 feet to less than 5,700 feet. Detailed site characterization documentation is provided in **Volume IV**.

SITE LOCATION MAP

SURFACE WASTE MANAGEMENT FACILITY
BASIN DISPOSAL, INC.
SAN JUAN COUNTY, NEW MEXICO

Based on:
FLORA VISTA, NM (1963, PHOTOREVISED 1979),
HORN CANYON, NM (1965 PHOTOREVISED 1979),
AZTEC, NM (1985 PROVISIONAL EDITION), AND
BLOOMFIELD (1985 PROVISIONAL EDITION),
USGS 7.5' SERIES (1:24,000 SCALE TOPOGRAPHIC) QUADRANGLES.

Drawing:P:\acad 2003\520.01.01\02\FIGURES\SITE LOCATION 24K.dwg
Date/Time:Oct. 27, 2008-09:15:21

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 10/27/08	CAD: SITE LOCATION 24K.dwg	PROJECT #: 520.01.01
DRAWN BY: MLH	REVIEWED BY: IKG	FIGURE 1
APPROVED BY: IKG	gei@gordonenvironmental.com	

1.2 Compliance Summary

The BDI facility has operated since 1985 in accordance with Oil Conservation Division (OCD) Permit No. NM-01-0005. The Facility's record has been updated numerous times throughout its existence to expand or upgrade surface waste management services with the latest major modification being approved in May 1999 (**Attachment A**). The existing 110,000 barrel (bbl) evaporation pond (Pond 1) is constructed with a 30-mil geomembrane liner and leak detection system and is equipped with aerators to enhance evaporation. The current injection well system was approved in October 1987 and is designed to dispose of up to 11,000 bbl/day of filtered water. The overall receiving and storage capacity of the Facility is approximately 122,400 bbl.

This Application for Modification is being submitted to the OCD for the approval to construct and operate two additional liquid waste evaporation ponds (Ponds 2 and 3), the addition of six receiving tanks, and two oil sales tanks. In addition this Modification updates the Facility Management Plans and Financial Assurance mechanism required by 19.15.36 NMAC. The proposed evaporation ponds will be constructed with a 60-mil HDPE primary liner, 200-mil geonet leak detection system and sump, and a 60-mil HDPE secondary liner (**Volume III**).

1.3 Permit Application Format

This four-volume set represents an Application for Modification in response to Section 8 of the OCD Surface Waste Management Regulations [19.15.36 NMAC]. More specifically, the BDI Facility is a **"commercial facility"** as defined in Section 19.15.36.7.A.(2). As specified in 19.15.36.12.A.(2) the permit **"...shall remain in effect for 10 years from the date the division approves the major modification".** Because the ultimate projected longevity of the Facility is in excess of 10 years, BDI anticipates renewing the Modification in compliance with 19.15.36.12.A.2.(a), prior to its expiration.

This Application for Modification provides the results of focused site characterization and hydrogeological investigations for the entire 28-acre site. Design data and supporting calculations in accordance with the applicable sections of 19.15.36 NMAC are presented for the area to be developed. The overall design and operating plans address the operation, and

closure of the evaporation ponds, as well as supporting infrastructure (i.e., stormwater drainage). Detailed engineering studies have been compiled and submitted for the BDI Facility, which is designed to accommodate the waste receipts over the ten-year Permit period.

For ease of review and reference, this Application for Permit has been organized in the same order and format as the 19.15.36 NMAC Surface Waste Management Facilities Regulations, Form C-137. **Volume I**, Permit Application Text, addresses the applicable requirements of 19.15.36 NMAC by restating each (**in bold**) followed by the appropriate response (*in italics*).

In many cases, the technical response to a particular item is so sufficiently detailed or complex that a separate graphic, table, report, or plan has been prepared. The applicable technical documents in this Application are cross-referenced in the narrative responses to each of the individual regulatory requirements as delineated in **Volume I**. Each section of each volume also includes, as applicable:

- Table of Contents
- List of Figures
- List of Tables
- List of Attachments

The Table of Contents for the entire four-volume Application for Modification is also included in each volume in order to assist in cross-referencing, along with the List of Permit Plans (**Table 2**). The four-volume Application is provided in two binders. Each binder is divided by tabs which identify the Volume and Section as referenced on the master Table of Contents.

Table 2
List of Permit Plans

Sheet No.	Title
1.	Site Location and Drawing Index
2.	Existing Site Conditions
3.	Grading Plan
4.	Cross Sections
5.	Drainage Plan
6.	Drainage Channel Profiles
7.	Engineering Details
8.	Liner Details

PART 36: SURFACE WASTE MANAGEMENT FACILITIES

19.15.36.8 SURFACE WASTE MANAGEMENT FACILITY PERMITS AND APPLICATION REQUIREMENTS:

A. Permit required. No person shall operate a surface waste management facility (other than a small landfarm registered pursuant to Paragraph (1) of Subsection A of 19.15.36.16 NMAC) except pursuant to and in accordance with the terms and conditions of a division-issued surface waste management facility permit.

*Basin Disposal, Inc. (BDI) has been operating a Surface Waste Management Facility under Permit No. NM-01-0005 since October 16, 1987. During this term BDI has modified the permit to update operations and increase design capacity with the most recent approval granted by OCD on May 19, 1999 (**Attachment A**).*

B. Permitting requirements. Except for small landfarms registered pursuant to Paragraph (1) of Subsection A of 19.15.36.16 NMAC, new commercial or centralized facilities prior to commencement of construction, and existing commercial or centralized facilities prior to modification or permit renewal, shall be permitted by the division in accordance with the applicable requirements of Subsection C of 19.15.36.8 and 19.15.36.11 NMAC.

BDI is requesting a Modification of Permit No. NM-01-0005 for 10 years. The purpose to expand the facility design capacity with the construction of two additional storage/evaporation ponds and the addition of eight processing tanks. This Application provides the applicable information required in 19.15.36 NMAC.

C. Application requirements for new facilities, major modifications and permit renewals. An applicant or operator shall file an application, form C-137, for a permit for a new surface waste management facility, to modify an existing surface waste management facility or for permit renewal with the environmental bureau in the division's Santa Fe office. The application shall include:

(1) the names and addresses of the applicant and principal officers and owners of 25 percent or more of the applicant;

*The completed form C-137 is located as the preface to this **Volume**. The names and addresses of the applicant and principal officers and owners of 25 percent or more of the applicant are:*

President: Jerry Sandel
P.O. Box 100
Aztec, NM 87410

Vice President: David Turner
P.O. Box 358
Farmington, NM 87499

(2) a plat and topographic map showing the surface waste management facility's location in relation to governmental surveys (quarter-quarter section, township and range); highways or roads giving access to the surface waste management facility site; watercourses; fresh water sources, including wells and springs; and inhabited buildings within one mile of the site's perimeter;

Figure 1 *is a Site Location Map that shows the BDI Facility plotted on the most current USGS Quadrangle map. The Site Location Map shows the Facility and the surrounding area.* ***Volume IV, Section 1; Siting Criteria*** *contains a more detailed plat and topographic map illustrating the required items in this Section.*

(3) the names and addresses of the surface owners of the real property on which the surface waste management facility is sited and surface owners of the real property within one mile of the site's perimeter;

The owner of the real property on which the surface waste management facility is sited is:

Mr. Jerry Sandel
P.O. Box 100
Aztec, NM 87410

Mr. David Turner
P.O. Box 358
Farmington, NM 87499

Attachment B *of this* ***Volume, Public Notification,*** *lists the names and addresses of real surface owners of the real property within one mile of the site's perimeter.*

(4) a description of the surface waste management facility with a diagram indicating the location of fences and cattle guards, and detailed construction/installation diagrams of pits, liners, dikes, piping, sprayers, tanks, roads, fences, gates, berms, pipelines crossing the surface waste management facility, buildings and chemical storage areas;

Volume III, Section 1; Permit Plans *provides the required items listed in this Section.*

(5) engineering designs, certified by a registered professional engineer, including technical data on the design elements of each applicable treatment, remediation and disposal method and detailed designs of surface impoundments;

Volume III, Section 1 *is a set of* ***Permit Plans*** *provided at a reduced scale that establishes the engineering design criteria for the Facility. The same drawings are submitted to the Department with this Application as a full-size (24" X 36") plan set:* ***Table 2****, Permit Plans*

Index, is provided with the Table of Contents. These Permit Plans, and the Certification Statement that prefaces this volume, have been signed and sealed by a professional engineer registered in the state of New Mexico. That engineer, who is a specialist in geotechnical engineering, is identified as follows:

I. Keith Gordon, P.E.
New Mexico Professional Engineer #10984
Principal, Gordon Environmental, Inc.
213 South Camino del Pueblo
Bernalillo, NM 87004
(505) 867-6990 Phone
(505) 867-6991 Fax

(6) a plan for management of approved oil field wastes that complies with the applicable requirements contained in 19.15.36.13, 19.15.36.14, 19.15.36.15 and 19.15.36.17 NMAC;

Volume II, Section 2; Oil Field Waste Management Plan, *provides the information required in 19.15.36.13.D, F through I. and 19.15.36.17 NMAC.*

(7) an inspection and maintenance plan that complies with the requirements contained in Subsection L of 19.15.36.13 NMAC;

Volume II, Section 1; Operations, Maintenance, and Inspection Plan provides *the information required in 19.15.36.13.L. (1), (2), and (3) NMAC. In addition, located in* ***Volume III, Section 2*** *is the* ***Liner Construction and Quality Assurance (CQA) Plan*** *for the installation of the geosynthetic liner system proposed for the evaporation ponds.*

(8) a hydrogen sulfide prevention and contingency plan that complies with those provisions of 19.15.11 NMAC that apply to surface waste management facilities;

Volume II, Section 3; Hydrogen Sulfide (H_2S) Prevention and Contingency Plan *provides information to ensure the regulatory thresholds in 19.15.11 NMAC are not exceeded. In addition the* ***Hydrogen Sulfide (H_2S) Prevention and Contingency Plan*** *addresses the requirements of 19.15.36.13.N NMAC concerning contingencies to minimize hazards to fresh water, public health, safety or the environment.*

(9) a closure and post closure plan, including a responsible third party contractor's cost estimate, sufficient to close the surface waste management facility in a manner that will protect fresh water, public health, safety and the environment (the closure and post closure plan shall comply with the requirements contained in Subsection D of 19.15.36.18 NMAC);

Volume II, Section 4; Closure/Post Closure Plan (C/PC) *addresses the information required in this section and 19.15.36.18.D NMAC.* ***Attachment C*** *of this* ***Volume, Financial Assurance,*** *provides estimated the third-party C/PC cost estimate to address the requirements in this section.*

(10) a contingency plan that complies with the requirements of Subsection N of 19.15.36.13 NMAC and with NMSA 1978, Sections 12-12-1 through 12-12-30, as amended (the Emergency Management Act);

Volume II, Section 5; Contingency Plan *provides the information required in this section.*

(11) a plan to control run-on water onto the site and run-off water from the site that complies with the requirements of Subsection M of 19.15.36.13 NMAC;

Volume III, Section 1; Engineering Design *provides the design for conveyance channels and detention pond to control run-on/run-off during the peak discharge from a 25-year, 24 hour storm. The BDI facility is not required to obtain a permit under the Multi-Sector General Permit for Stormwater Discharges promulgated September 29, 2008 as the operation has not had a reportable spill as defined in Subpart I. However, BDI through adherence to the* ***Operations, Maintenance, and Inspection Plan (Volume II, Section 1)*** *and construction of the Detention Pond described in this Application* ***(Volume III, Section 1),*** *will prevent discharge of pollutants to the waters of the state or United States in violation of state water quality standards.*

(12) in the case of an application to permit a new or expanded landfill, a leachate management plan that describes the anticipated amount of leachate that will be generated and the leachate's handling, storage, treatment and disposal, including final post closure options;

Not applicable.

(13) in the case of an application to permit a new or expanded landfill, a gas safety management plan that complies with the requirements of Subsection O of 19.15.36.13 NMAC;

Not applicable.

(14) a best management practice plan to ensure protection of fresh water, public health, safety and the environment;

Volume II, Section 1; Operations, Inspection, and Maintenance Plan *incorporates a best management practices plan to ensure the protection of fresh water, public health, safety, and the environment.*

(15) geological/hydrological data including:

- **(a) a map showing names and location of streams, springs or other watercourses, and water wells within one mile of the site;**
- **(b) laboratory analyses, performed by an independent commercial laboratory, for major cations and anions; benzene, toluene, ethyl benzene and xylenes (BTEX); RCRA metals; and total dissolved solids (TDS) of ground water samples of the shallowest fresh water aquifer beneath the proposed site;**
- **(c) depth to, formation name, type and thickness of the shallowest fresh water aquifer;**
- **(d) soil types beneath the proposed surface waste management facility, including a lithologic description of soil and rock members from ground surface down to the top of the shallowest fresh water aquifer;**
- **(e) geologic cross-sections;**
- **(f) potentiometric maps for the shallowest fresh water aquifer; and**
- **(g) porosity, permeability, conductivity, compaction ratios and swelling characteristics for the sediments on which the contaminated soils will be placed;**

Regional and site-specific hydrogeologic data is provided in ***Volume IV, Section 2; Hydrogeology,*** *in a report and supplements by John Shomaker & Associates (September 2008) entitled "Subsurface and Groundwater Investigation in support of the Modification of a Surface Waste Management Facility, Basin Disposal, Inc., Bloomfield, New Mexico".*

(16) certification by the applicant that information submitted in the application is true, accurate and complete to the best of the applicant's knowledge, after reasonable inquiry; and

The certification is located in the preface of ***Volume I*** *of this Application (Form C-137).*

(17) other information that the division may require to demonstrate that the surface waste management facility's operation will not adversely impact fresh water, public health, safety or the environment and that the surface waste management facility will comply with division rules and orders.

BDI will provide other applicable information requested by the Division in order demonstrate that the surface waste management facility's operation will not adversely impact fresh water, public health, safety or the environment. In addition, BDI will comply with all applicable Division rules and orders.

D. Application requirements for minor modifications. An existing surface waste management facility applying for a minor modification shall file a form C-137 with the environmental bureau in the division's Santa Fe office describing the proposed change and identifying information that has changed from its last C-137 filing.

BDI will comply with this requirement when applicable.

E. Determination that an application is administratively complete. Upon receipt of an application for a surface waste management facility permit or modification or renewal of an existing surface waste management facility permit, the division shall review the application for administrative completeness. To be deemed administratively complete, the application shall provide information required by Subsection C or D (as applicable) of 19.15.36.8 NMAC. The division shall notify the applicant in writing when it deems the application administratively complete. If the division determines that the application is not administratively complete, the division shall notify the applicant of the deficiencies in writing within 30 days after the application's receipt and state what additional information is necessary.

No response required.

19.15.36.9 NOTICE REQUIREMENTS FOR NEW SURFACE WASTE MANAGEMENT FACILITIES, MAJOR MODIFICATIONS OR RENEWALS AND ISSUANCE OF A TENTATIVE DECISION:

A. Upon receipt of notification of the division's determination that the application is administratively complete, the applicant for a new surface waste management facility permit, permit renewal or major modification shall give written notice of the application, by certified mail, return receipt requested, to the surface owners of record within one-half mile of the surface waste management facility, the county commission of the county where the surface waste management facility

site is located, the appropriate city officials if the surface waste management facility site is within city limits or within one-half mile of the city limits, and affected federal, tribal or pueblo governmental agencies. The notice shall contain the information in Paragraphs (1) through (4) of Subsection F of 19.15.36.9 NMAC. The division may extend the distance requirements for notice if the division determines that the proposed surface waste management facility has the potential to adversely impact fresh water, public health, safety or the environment at a distance greater than one-half mile. The applicant shall furnish proof that it has given the required notices.

Attachment B *of this* ***Volume, Public Notification,*** *provides a draft public notice prepared in accordance with 19.15.36.9.F.(1) through (4) which, following OCD approval, will be provided to the surface owners of record, as determined by the San Juan County Assessor's Office, within one-half mile of the facility. Additionally, the notification will be provided to the San Juan County Commission, the City of Bloomfield, City of Aztec, City of Farmington and the Navajo Nation.*

B. The division shall distribute notice of its determination that an application for a new surface waste management facility or for a renewal or major modification of an existing surface waste management facility is administratively complete to persons who have requested notification of division and commission hearing dockets within 30 days following the date that the division determines the application to be administratively complete.

No response required

C. A person wishing to comment on an application prior to the division's preliminary consideration of the application may file comments within 30 days, or as extended by the director, after the later of the date when the applicant mails the notice required by Subsection A of 19.15.36.9 NMAC or the date when the division distributes the notice provided in Subsection B of 19.5.36.9 NMAC.

No response required

D. Within 60 days after the end of the public comment period provided in Subsection C of 19.15.36.9 NMAC, the division shall issue a tentative decision concerning the application, renewal or modification, including proposed conditions for approval or reasons for disapproval, as applicable. The division shall mail notice of the tentative decision, together with a copy of the decision, by certified mail, return receipt requested, to the applicant and shall post notice on the division's website, together with a copy of the tentative decision.

No response required

E. Within 30 days after receiving the division's tentative decision, the applicant shall provide notice of the tentative decision by:

(1) publishing a display ad in English and Spanish, in a form approved by the division, in a newspaper of general circulation in this state and in a newspaper of general circulation in the county where the surface waste management facility is or will be located; the display ad shall be at least three inches by four inches and shall not be published in the newspaper's legal or classified sections;

(2) mailing notice by first class mail or e-mail to persons, as identified to the applicant by the division, who have requested notification of applications generally, or of the particular application, including persons who have filed comments on the particular application during the initial public comment period, and who have included in such comments a legible return address or e-mail address; and

(3) mailing notice by first class or e-mail to affected local, state, federal or tribal governmental agencies, as determined and identified to the applicant by the division.

BDI will comply with this requirement. It is proposed that the display add be published in the Albuquerque Journal and the Farmington Daily News, both of which are newspapers in general circulation in the State of New Mexico and San Juan County.

F. This notice issued pursuant to Subsection E of 19.15.36.9 NMAC shall include:

(1) the applicant's name and address;

(2) the surface waste management facility's location, including a street address if available, and sufficient information to locate the surface waste management facility with reference to surrounding roads and landmarks;

(3) a brief description of the proposed surface waste management facility;

(4) the depth to, and TDS concentration of, the ground water in the shallowest aquifer beneath the surface waste management facility site;

(5) a statement that the division's tentative decision is available on the division's website, or, upon request, from the division clerk, including the division clerk's name, address and telephone number;

(6) a description of alternatives, exceptions or waivers that may be under consideration in accordance with Subsection G of 19.15.36.18 NMAC or 19.15.36.19 NMAC;

(7) a statement of the comment period and of the procedures for requesting a hearing on the application; and

(8) a brief statement of the procedures the division shall follow in making a final decision.

BDI will, upon receiving the Division's tentative decision, issue a public notice compliant with this section.

RECEIVED
AUG 27 2009
Environmental Bureau
Oil Conservation Division

19.15.36.10 COMMENTS AND HEARING ON APPLICATION:

A. A person, whether or not such person has previously submitted comments, may file comments or request a hearing on the application by filing their comments or, in accordance with 19.15.4.9 NMAC, a hearing request with the division clerk within 30 days after the date that the applicant issued public notice of the division's tentative decision. A request for a hearing shall be in writing and shall state specifically the reasons why a hearing should be held. The division shall schedule a public hearing on the application if, in addition to the requirements in 19.15.4.9 NMAC:

(1) the division has proposed to deny the application or grant it subject to conditions not expressly required by rule, and the applicant requests a hearing;

(2) the director determines that there is significant public interest in the application;

(3) the director determines that comments have raised objections that have probable technical merit; or

(4) determination of the application requires that the division make a finding, pursuant to Paragraph (3) of Subsection F of 19.15.2.7 NMAC, whether a water source has a present or reasonably foreseeable beneficial use that contamination would impair.

B. If the division schedules a hearing on an application, the hearing shall be conducted according to 19.15.4.9 through 19.15.4.17 NMAC.

No response required.

19.15.36.11 FINANCIAL ASSURANCE REQUIREMENTS:

A. Centralized facilities. Upon notification by the division that it has approved a permit but prior to the division issuing the permit, an applicant for a new centralized facility permit shall submit acceptable financial assurance in the amount of $25,000 per centralized facility, or a statewide "blanket" financial assurance in the amount of $50,000 to cover all of that applicant's centralized facilities, unless such applicant has previously posted a blanket financial assurance for centralized facilities.

No response required. BDI is an existing Commercial Facility.

B. New commercial facilities or major modifications of existing commercial facilities. Upon notification by the division that it has approved a permit for a new commercial facility or a major modification of an existing commercial facility but prior to the division issuing the permit, the applicant shall submit acceptable financial assurance in the amount of the commercial facility's estimated closure and post closure cost, or $25,000, whichever is greater. The

commercial facility's estimated closure and post closure cost shall be the amount provided in the closure plan the applicant submitted unless the division determines that such estimate does not reflect a reasonable and probable closure and post closure cost, in which event, the division shall determine the estimated closure and post closure cost and shall include such determination in its tentative decision. If the applicant disagrees with the division's determination of estimated closure and post closure cost, the applicant may request a hearing as provided in 19.15.36.10 NMAC. If the applicant so requests, and no other person files a request for a hearing regarding the application, the hearing shall be limited to determination of estimated closure and post closure cost.

***Attachment C** of this **Volume, Financial Assurance,** provides the current mechanism in the form of a Letter of Credit for $140,000. This amount will be revised upon review and approval of the Engineer's C/PC Cost Estimate prior to issuance of the new permit.*

C. Terms of financial assurance. The financial assurance shall be on division-prescribed forms, payable to the state of New Mexico and conditioned upon the surface waste management facility's proper operation, site closure and post closure monitoring in compliance with state of New Mexico statutes, division rules and the surface waste management facility permit terms. The applicant shall notify the division of a material change affecting the financial assurance within 30 days of discovery of such change.

BDI will comply with this requirement.

D. Forfeiture of financial assurance. The division shall give the operator 20 days notice and an opportunity for a hearing prior to forfeiting financial assurance.

No response required.

E. Forms of financial assurance. The division may accept the following forms of financial assurance.

(1) Surety bonds. A surety bond shall be executed by the applicant and by a corporate surety licensed to do business in the state, and shall be non-cancelable.

(2) Letters of credit. A letter of credit shall be issued by a bank organized or authorized to do commercial banking business in the United States, shall be irrevocable for a term of not less than five years and shall provide for automatic renewal for successive, like terms upon expiration, unless the issuer has notified the division in writing of non-renewal at least 90 days before its expiration date. The letter of credit shall be payable to the state of New Mexico in part or in full upon receipt from the director or the director's authorized representative of demand for payment accompanied by a notice of forfeiture.

(3) **Cash accounts. An applicant may provide financial assurance in the form of a federally insured or equivalently protected cash account or accounts in a financial institution, provided that the operator and the financial institution shall execute as to each such account a collateral assignment of the account to the division, which shall provide that only the division may authorize withdrawals from the account. In the event of forfeiture pursuant to Subsection C of 19.15.36.18 NMAC, the division may, at any time and from time to time, direct payment of all or part of the balance of such account (excluding interest accrued on the account) to itself or its designee for the surface waste management facility's closure.**

***Attachment C** of this **Volume, Financial Assurance,** provides the current mechanism in the form of a Letter of Credit for $140,000. This amount will be revised upon review and approval of the Engineer's C/PC Cost Estimate prior to issuance of the new permit.*

F. Replacement of financial assurance.

(1) **The division may allow an operator to replace existing forms of financial assurance with other forms of financial assurance that provide equivalent coverage.**

(2) **The division shall not release existing financial assurance until the operator has submitted, and the division has approved, an acceptable replacement.**

BDI will comply with this requirement.

G. Review of adequacy of financial assurance. The division may at any time not less than five years after initial acceptance of financial assurance for a commercial facility, or whenever the operator applies for a major modification of the commercial facility's permit, initiate a review of such financial assurance's adequacy. Additionally, whenever the division determines that a landfarm operator has not achieved the closure standards specified in Paragraph (3) of Subsection G of 19.15.36.15 NMAC, the division may review the adequacy of the landfarm operator's financial assurance, without regard to the date of its last review. Upon determination, after notice to the operator and an opportunity for a hearing, that the financial assurance is not adequate to cover the reasonable and probable cost of a commercial facility's closure and post closure monitoring, the division may require the operator to furnish additional financial assurance sufficient to cover such reasonable and probable cost, provided that the financial assurance required of a commercial facility permitted prior to the effective date of 19.15.36 NMAC shall not exceed $250,000 except in the event of a major modification of the commercial facility. If such a commercial facility applies for a major modification, the division shall determine the applicable financial assurance requirement based on the total estimated closure and post closure cost of the commercial facility as modified, without regard to the $250,000 limit.

Attachment C of this Volume, Financial Assurance, provides the revised C/PC Cost Estimate addressing the proposed improvements.

19.15.36.12 PERMIT APPROVAL, DENIAL, REVOCATION, SUSPENSION, MODIFICATION OR TRANSFER:

A. Granting of permit.

(1) The division may issue a permit for an new surface waste management facility or major modification upon finding that an acceptable application has been filed, that the conditions of 19.15.36.9 and 19.15.36.11 NMAC have been met and that the surface waste management facility or modification can be constructed and operated in compliance with applicable statutes and rules and without endangering fresh water, public health, safety or the environment.

Attachment B of this Volume, Public Notice, provides the current list of property owners within one-half mile of the facility. Following OCD review and approval of the Application, BCI will distribute the public notice in accordance with 19.15.36.9 NMAC. Attachment C of this Volume, Financial Assurance, provides the updated C/PC Cost Estimate that will be the basis for the revised financial assurance mechanism to be put into place in accordance with 19.15.36.11 upon approval of the permit. This Application provides the required plans and engineering calculations to construct and operate the facility in compliance with applicable statutes and rules that ensure fresh water, public health, safety, or the environment will not be endangered.

(2) Each permit the division issues for a new surface waste management facility shall remain in effect for 10 years from the date of its issuance. If the division grants a permit for a major modification of a surface waste management facility, the permit for that surface waste management facility shall remain in effect for 10 years from the date the division approves the major modification.

(a) A surface waste management facility permit may be renewed for successive 10-year terms. If the holder of a surface waste management facility permit submits an application for permit renewal at least 120 days before the surface waste management facility permit expires, and the operator is not in violation of the surface waste management facility permit on the date of its expiration, then the existing surface waste management facility permit for the same activity shall not expire until the division has approved or denied an application for renewal. If the division has not notified the operator of a violation, if the operator is diligently

pursuing procedures to contest a violation or if the operator and the division have signed an agreed compliance order providing for remedying the violation, then the surface waste management facility permit shall continue in effect as above provided notwithstanding the surface waste management facility permit violation's existence. A surface waste management facility permit continued under this provision remains fully effective and enforceable.

This Application requests a Permit Modification in accordance with 19.15.36 NMAC. The facility is not in violation of its Permit nor has been notified of any violation of its Permit at the time of submittal of this Application. A new Application for Permit Renewal will be submittal to OCD at least 120 prior to the expiration of the Permit granted in response to the Application.

(b) An application for permit renewal shall include and adequately address the information necessary for evaluation of a new surface waste management facility permit as provided in Subsection C of 19.15.36.8 NMAC. Previously submitted materials may be included by reference provided they are current, readily available to the division and sufficiently identified so that the division may retrieve them.

*Located throughout this Application is information provided to address the applicable requirements of 19.15.36.8.C NMAC. Any previously submitted materials which are current and are required for evaluation of this Application for Modification are either provided within a specified **Volume**, or properly identified for ease of retrieval by the Division.*

(c) The operator shall give public notice of the renewal application in the manner prescribed by 19.15.36.9 NMAC. The division shall grant an application for renewal if the division finds that an acceptable application has been filed, that the conditions of 19.15.36.9 and 19.15.36.11 NMAC have been met and that the surface waste management facility can be operated in compliance with applicable statutes and rules and without endangering fresh water, public health, safety or the environment.

BDI will comply with the public notice requirements of 19.15.36.9 NMAC and the financial assurance requirements of 19.15.36.11 NMAC as necessary to achieve Permit approval.

(3) **The division shall review each surface waste management facility permit at least once during the 10-year term, and shall review surface waste management facility permits to which Paragraph (2) of Subsection A of 19.15.36.12 NMAC does not apply at least every five years. The review shall address the operation, compliance history, financial assurance and technical requirements for the surface waste management facility. The division, after notice to the operator and an opportunity for a hearing, may require appropriate modifications of the surface waste management facility permit, including modifications necessary to make the surface waste management facility permit terms and conditions consistent with statutes, rules or judicial decisions.**

BDI will make available all necessary operational, compliance, financial assurance and other technical documents to the Division at any time during the 10 year permit period for the completion of any mid-term review.

B. Denial of permit. The division may deny an application for a surface waste management facility permit or modification of a surface waste management facility permit if it finds that the proposed surface waste management facility or modification may be detrimental to fresh water, public health, safety or the environment. The division may also deny an application for a surface waste management facility permit if the applicant, an owner of 25 percent or greater interest in the applicant or an affiliate of the applicant has a history of failure to comply with division rules and orders or state or federal environmental laws; is subject to a division or commission order, issued after notice and hearing, finding such entity to be in violation of an order requiring corrective action; or has a penalty assessment for violation of division or commission rules or orders that is unpaid more than 70 days after issuance of the order assessing the penalty. An affiliate of an applicant, for purposes of Subsection B of 19.15.36.12 NMAC, shall be a person who controls, is controlled by or under is common control with the applicant or a 25 percent or greater owner of the applicant.

Not applicable.

C. Additional requirements. The division may impose conditions or requirements, in addition to the operational requirements set forth in 19.15.36 NMAC, that it determines are necessary and proper for the protection of fresh water, public health, safety or the environment. The division shall incorporate such additional conditions or requirements into the surface waste management facility permit.

BDI will comply with any additional requirements or conditions imposed by the Division that protect fresh water, public health, safety or the environment.

D. Revocation, suspension or modification of a permit. The division may revoke, suspend or impose additional operating conditions or limitations on a surface waste management facility permit at any time, for good cause, after notice to the operator and an opportunity for a hearing. The division may suspend a surface waste management facility permit or impose additional conditions or limitations in an emergency to forestall an imminent threat to fresh water, public health, safety or the environment, subject to the provisions of NMSA 1978, Section 70-2-23, as amended. If the division initiates a major modification it shall provide notice in accordance with 19.15.36.9 NMAC. Suspension of a surface waste management facility permit may be for a fixed period of time or until the operator remedies the violation or potential violation. If the division suspends a surface waste management facility's permit, the surface waste management facility shall not accept oil field waste during the suspension period.

No response required.

E. Transfer of a permit. The operator shall not transfer a permit without the division's prior written approval. A request for transfer of a permit shall identify officers, directors and owners of 25 percent or greater in the transferee. Unless the director otherwise orders, public notice or hearing are not required for the transfer request's approval. If the division denies the transfer request, it shall notify the operator and the proposed transferee of the denial by certified mail, return receipt requested, and either the operator or the proposed transferee may request a hearing with 10 days after receipt of the notice. Until the division approves the transfer and the required financial assurance is in place, the division shall not release the transferor's financial assurance.

BDI will comply with this requirement.

19.15.36.13 SITING AND OPERATIONAL REQUIREMENTS APPLICABLE TO ALL PERMITTED SURFACE WASTE MANAGEMENT FACILITIES:

Except as otherwise provided in 19.15.36 NMAC.

A. Depth to ground water.

(1) No landfill shall be located where ground water is less than 100 feet below the lowest elevation of the design depth at which the operator will place oil field waste.

(2) No landfarm that accepts soil or drill cuttings with a chloride concentration that exceeds 500 mg/kg shall be located where ground water is less than 100 feet below the lowest elevation at which the operator will place oil field waste. See Subsection A of 19.15.36.15 NMAC for oil field waste acceptance criteria.

(3) No landfarm that accepts soil or drill cuttings with a chloride concentration that is 500 mg/kg or less shall be located where ground

water is less than 50 feet below the lowest elevation at which the operator will place oil field waste.

(4) No small landfarm shall be located where ground water is less than 50 feet below the lowest elevation at which the operator will place oil field waste.

Not applicable. The BDI Facility is not a landfill or landfarm.

(5) No other surface waste management facility shall be located where ground water is less than 50 feet below the lowest elevation at which the operator will place oil field waste.

The regional ground water elevation at the facility is estimated to be at elevation 5600 feet. The lowest elevation in the ponds (Pond 3 Sump) is set at elevation 5707 feet, which provides more than 100' of separation distance, ***therefore BDI is in compliance with this requirement.***

Volume IV, Section 2; Hydrogeology *provides the Subsurface and Ground Water Investigation reports prepared by John Shomaker & Associates, Inc. (JSAI). Included in* ***Section 2*** *is the June 2009 update by JSAI that addresses specific comments by OCD in their 05/01/09 Request for Additional Information (RAI). These reports concluded that perched groundwater exists at 42.22' below ground level (bgl) in Assessment Well AW-1 and between 17.74' and 29.25' bgl in AW-2. However, the total dissolved solids (TDS) concentration are 38,000 mg/L and 29,000 mg/L in AW-1 and AW-2, respectively, which is significantly above the 10,000 mg/L TDS groundwater protection standard. As defined in 19.15.2.7.F.(3) NMAC and New Mexico Water Quality Commission (WQCC) regulation 20.6.2.3101.A NMAC, this saturated zone is not considered fresh water to be protected. BDI will comply with this requirement by utilizing existing and proposed liner system, operating procedures, and C/PC programs as demonstrated in* ***Volume III, Engineering Design and Calculations.***

B. No surface waste management facility shall be located:

(1) within 200 feet of a watercourse, lakebed, sinkhole or playa lake;

BDI is not located within 200 feet of a watercourse, lakebed, sinkhole or playa lake. *Documentation regarding location of watercourses, lakebeds, sinkholes and playa lakes is provided in* ***Volume IV, Section 1; Siting Criteria.***

(2) within an existing wellhead protection area or 100-year floodplain;

*BDI is **not located within an existing wellhead protection area or 100-year floodplain**. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM FM3500640550B, revised May 2002) was reviewed for 100-year floodplain delineations near the facility. A review of the floodplain maps, in addition to site inspections, did not indicate watercourses or surface features characteristic of a regulated floodplain within or adjacent to the proposed modification. A more detailed graphical description of the site location with respect to floodplains, and the applicable wellhead protection areas, is furnished in **Volume, IV, Section 1; Siting Criteria**.*

(3) within, or within 500 feet of, a wetland;

*The Facility is **not located within 500 feet of a wetland**. There are no areas meeting the definition of wetland on or adjacent to the facility property as defined by the National Wetland Inventory Mapping Convention. Wetlands are addressed in **Volume, IV, Section 1; Siting Criteria** including the applicable National Wetlands Inventory Map published by the U.S. Department of the Interior.*

(4) within the area overlying a subsurface mine;

There are no known records of subsurface mines** in the immediate vicinity of the facility location. The "Mines, Mills and Quarries in New Mexico" map that confirms the absence of these sites in the vicinity of BDI is included in **Volume, IV, Section 1; Siting Criteria.

(5) within 500 feet from the nearest permanent residence, school, hospital, institution or church in existence at the time of initial application; or

*The Facility site **is in excess of 500 feet from the nearest permanent residence, school, hospital, institution, or church.** The closest permanent residence is approximately 1050 feet directly south of the site. A more detailed description of site location and adjacent land use is provided in **Volume, IV, Section 1; Siting Criteria.***

(6) within an unstable area, unless the operator demonstrates that engineering measures have been incorporated into the surface waste management facility design to ensure that the surface waste management facility's integrity will not be compromised.

An unstable area is defined as " . . . susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components. Examples of unstable areas are poor foundation conditions, areas susceptible to mass movements, and Karst terrain areas . . ."
(19.15.2.7.U.(6) NMAC).

As described in ***Volume IV, Section 1; Siting Criteria*** *there are no karst features or active faults within 200 feet of the site, and earthquake risk is low. The site topography is characterized by relatively gently sloping surfaces underlain by shale, sandstone, and alluvium. No limestone or other carbonate rock is exposed near the property, and no sinkholes or slumps have been reported within the immediate vicinity of the facility.*

Select textural and hydrologic properties of the stratigraphic units encountered in boreholes and in the regional geology are described in the Shomaker report ***(Volume II, Section 2)****. These properties and the inferred geotechnical characteristics of the units, together with the low seismic risk, document that foundation conditions are suitable for the surface ponds at this site. In summary, the topography of the site, and the nature of the sediments beneath the facility, indicate that the site is stable.*

C. No surface waste management facility shall exceed 500 acres.

The BDI occupies approximately 28 acres, in northwest quarter of Section 3, Township 29 North, Range 11 West of the New Mexico Principal Meridian. The Site Location Map, included as ***Figure 1****, identifies the limits of the proposed facility. The Legal Description, which also describes the size of the facility and the facility boundaries, is provided as a detailed Plat Survey Map in* ***Volume IV, Section 1; Siting Criteria****.*

D. The operator shall not accept oil field wastes transported by motor vehicle at the surface waste management facility unless the transporter has a form C-133, authorization to move liquid waste, approved by the division.

BDI will comply with this requirement. ***Volume II, Section 2; Oil Field Waste Management Plan*** *requires that, prior to acceptance of any produced water, the transporter provide the facility with a Division approved form C-133.*

E. The operator shall not place oil field waste containing free liquids in a landfill or landfarm cell. Operators shall use the paint filter test, as prescribed by the EPA (EPA SW-846, method 9095) to determine conformance of the oil field waste to this criterion.

Not applicable. The BDI Facility is not a landfill or landfarm.

F. Surface waste management facilities shall accept only exempt or non-hazardous waste, except as provided in Paragraph (3) of Subsection F of 19.15.36.13 NMAC. The operator shall not accept hazardous waste at a surface waste management facility. The operator shall not accept wastes containing regulated NORM at a surface waste management facility except as provided in 19.15.35 NMAC. The operator shall require the following documentation for accepting oil field wastes, and both the operator and the generator shall maintain and make the documentation available for division inspection.

(1) Exempt oil field wastes. The operator shall require a certification on form C-138, signed by the generator or the generator's authorized agent, that represents and warrants that the oil field wastes are generated from oil and gas exploration and production operations, are exempt waste and are not mixed with non-exempt waste. The operator shall have the option to accept such certifications on a monthly, weekly or per load basis. The operator shall maintain and shall make the certificates available for the division's inspection.

BDI will comply with this requirement. ***Volume II, Section 2; Oil Field Waste Management Plan*** *provides a more detailed description of produced water acceptance protocol. Included in this Plan is the Form C-138 certification, certification frequency, and NORM acceptance requirements. BDI will maintain and make available certificates for the Division's inspections.*

(2) Non-exempt, non-hazardous, oil field wastes. The operator shall require a form C-138, oil field waste document, signed by the generator or its authorized agent. This form shall be accompanied by acceptable documentation to determine that the oil field waste is non-hazardous.

BDI will comply with this requirement. ***Volume II, Section 2; Oil Field Waste Management Plan*** *provides a detailed description of oil field waste acceptance protocol. Included in this Plan is the Form C-138 certification and additional documentation that the oilfield waste is non-hazardous.*

(3) Emergency non-oil field wastes. The operator may accept non-hazardous, non-oil field wastes in an emergency if ordered by the department of public safety. The operator shall complete a form C-138, oil field waste document, describing the waste, and maintain the same, accompanied by the department of public safety order, subject to division inspection.

BDI will comply with this requirement.

G. The operator of a commercial facility shall maintain records reflecting the generator, the location of origin, the location of disposal within the commercial facility, the volume and type of oil field waste, the date of disposal and the hauling company for each load or category of oil field waste accepted at the commercial facility. The operator shall maintain such records for a period of not less than five years after the commercial facility's closure, subject to division inspection.

BDI will comply with this requirement. ***Volume II, Section 2; Oil Field Waste Management Plan*** *provides a detailed description of oil field waste acceptance recordkeeping forms. The forms in this Plan include the information required in this subsection and will be maintained and retained for a period of not less than five years following facility closure. BDI will make these records available for Division inspection upon request.*

H. Disposal at a commercial facility shall occur only when an attendant is on duty unless loads can be monitored or otherwise isolated for inspection before disposal. The surface waste management facility shall be secured to prevent unauthorized disposal.

The facility is operated 24 hours a day, 7 days a week with the exception of 12 hours for Thanksgiving and 24 hours at Christmas. During those rare hours that the facility is closed, the facility is secured with a six-foot high chain link fence and locking gates to prevent any unauthorized access or disposal while an attendant is not on duty. A truck with an acceptable load of oil field waste that may arrive while the facility is closed may park outside the fence until a qualified inspection can take place upon the arrival of an attendant. In this

case, the load will be inspected for any leakage and will be required to have any valves or access ports secured and locked to prevent spillage or tampering.

I. To protect migratory birds, tanks exceeding eight feet in diameter, and exposed pits and ponds shall be screened, netted or covered. Upon the operator's written application, the division may grant an exception to screening, netting or covering upon the operator's showing that an alternative method will protect migratory birds or that the surface waste management facility is not hazardous to migratory birds. Surface waste management facilities shall be fenced in a manner approved by the division.

BDI requests an exception to this requirement. ***Volume II, Section 6; Migratory Bird Protection Plan*** *describes the alternate methodology to the screening requirement of the storage ponds. This Plan describes visual inspections and migratory bird retrieval and clean-up procedures should bird(s) require decontamination. A records review and interviews with site personnel have confirmed no history of bird congregations or injuries resulting from the evaporation pond operation; therefore the facility is in compliance with 19.15.36.13.I.*

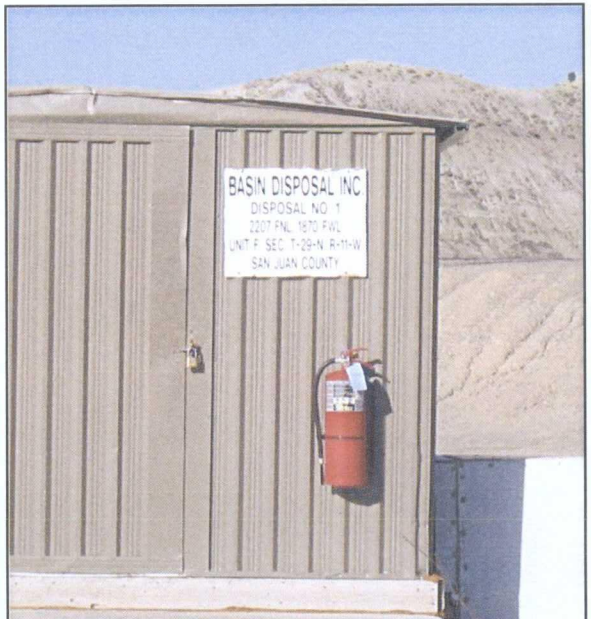
J. Surface waste management facilities shall have a sign, readable from a distance of 50 feet and containing the operator's name; surface waste management facility permit or order number; surface waste management facility location by unit letter, section, township and range; and emergency telephone numbers.

The existing signs meet the requirements of this subsection, as demonstrated by ***Figure 2****.*

K. Operators shall comply with the spill reporting and corrective action provisions of 19.15.30 or 19.15.29 NMAC.

Volume III, Engineering Design and Calculations *and other applicable plans in this Application are designed to prevent pollutants from entering surface and groundwater. Successful implementation of these programs will ensure compliance with 19.15.30 NMAC.* ***Volume II, Section 5, Contingency Plan*** *is designed to comply with the notification and corrective action as required in 19.15.29 NMAC.*

Entry Sign, Located on the east side of the main office.



Sign Located on the on-site wellhead building.

Sign Located at the main oil storage tank.

SITE SIGNS

SURFACE WASTE MANAGEMENT FACILITY
BASIN DISPOSAL, INC.
SAN JUAN COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 09/03/08	CAD: Sitesign.doc	PROJECT #: 520.01.01
DRAWN BY: PG	REVIEWED BY: AY	FIGURE 2
APPROVED BY: IKG	gei@gordonenvironmental.com	

L. Each operator shall have an inspection and maintenance plan that includes the following:

(1) monthly inspection of leak detection sumps including sampling if fluids are present with analyses of fluid samples furnished to the division; and maintenance of records of inspection dates, the inspector and the leak detection system's status;

(2) semi-annual inspection and sampling of monitoring wells as required, with analyses of ground water furnished to the division; and maintenance of records of inspection dates, the inspector and ground water monitoring wells' status; and

(3) inspections of the berms and the outside walls of pond levees quarterly and after a major rainfall or windstorm, and maintenance of berms in such a manner as to prevent erosion.

BDI will comply with this requirement. ***Volume II, Section 1; Operations, Maintenance and Inspection Plan*** *describes in detail the methods and frequency for inspections, sampling, recordkeeping, and maintenance for the leak detection sumps, monitoring wells, berms and levees.*

M. Each operator shall have a plan to control run-on water onto the site and run-off water from the site, such that:

(1) the run-on and run-off control system shall prevent flow onto the surface waste management facility's active portion during the peak discharge from a 25-year storm; and

(2) run-off from the surface waste management facility's active portion shall not be allowed to discharge a pollutant to the waters of the state or United States that violates state water quality standards.

Volume III, Engineering Design and Calculations *provides the design for conveyance channels and the detention pond to control run-on/run-off during the peak discharge from a 25-year storm. The BDI facility is not required to obtain a permit under the Multi-Sector General Permit for Stormwater Discharges promulgated September 29, 2008 as the operations has not had a reportable spill as defined in Subpart I. However, BDI through adherence to the* ***Operations, Maintenance, and Inspection Plan, Volume II, Section 1*** *and construction of the detention pond described in this Application, will prevent discharge of pollutants to the waters of the state or United States in violation of state water quality standards.*

N. **Contingency plan. Each operator shall have a contingency plan. The operator shall provide the division's environmental bureau with a copy of an amendment to the contingency plan, including amendments required by Paragraph (8) of Subsection N of 19.15.36.13 NMAC; and promptly notify the division's environmental bureau of changes in the emergency coordinator or in the emergency coordinator's contact information. The contingency plan shall be designed to minimize hazards to fresh water, public health, safety or the environment from fires, explosions or an unplanned sudden or non-sudden release of contaminants or oil field waste to air, soil, surface water or ground water. The operator shall carry out the plan's provisions immediately whenever there is a fire, explosion or release of contaminants or oil field waste constituents that could threaten fresh water, public health, safety or the environment; provided that the emergency coordinator may deviate from the plan as necessary in an emergency situation. The contingency plan for emergencies shall:**

(1) **describe the actions surface waste management facility personnel shall take in response to fires, explosions or releases to air, soil, surface water or ground water of contaminants or oil field waste containing constituents that could threaten fresh water, public health, safety or the environment;**

(2) **describe arrangements with local police departments, fire departments, hospitals, contractors and state and local emergency response teams to coordinate emergency services;**

(3) **list the emergency coordinator's name; address; and office, home and mobile phone numbers (where more than one person is listed, one shall be named as the primary emergency coordinator);**

(4) **include a list, which shall be kept current, of emergency equipment at the surface waste management facility, such as fire extinguishing systems, spill control equipment, communications and alarm systems and decontamination equipment, containing a physical description of each item on the list and a brief outline of its capabilities;**

(5) **include an evacuation plan for surface waste management facility personnel that describes signals to be used to begin evacuation, evacuation routes and alternate evacuation routes in cases where fire or releases of wastes could block the primary routes;**

(6) **include an evaluation of expected contaminants, expected media contaminated and procedures for investigation, containment and correction or remediation;**

(7) **list where copies of the contingency plan will be kept, which shall include the surface waste management facility; local police departments, fire departments and hospitals; and state and local emergency response teams;**

(8) **indicate when the contingency plan will be amended, which shall be within five working days whenever:**

(a) **the surface waste management facility permit is revised or modified;**

(b) **the plan fails in an emergency;**

(c) **the surface waste management facility changes design, construction, operation, maintenance or other circumstances in a way that increases the potential for fires, explosions or releases of**

oil field waste constituents that could threaten fresh water, public health, safety or the environment or change the response necessary in an emergency;

(d) the list of emergency coordinators or their contact information changes; or

(e) the list of emergency equipment changes;

(9) describe how the emergency coordinator or the coordinator's designee, whenever there is an imminent or actual emergency situation, will immediately;

(a) activate internal surface waste management facility alarms or communication systems, where applicable, to notify surface waste management facility personnel; and

(b) notify appropriate state and local agencies with designated response roles if their assistance is needed;

(10) describe how the emergency coordinator, whenever there is a release, fire or explosion, will immediately identify the character, exact source, amount and extent of released materials (the emergency coordinator may do this by observation or review of surface waste management facility records or manifests, and, if necessary, by chemical analysis) and describe how the emergency coordinator will concurrently assess possible hazards to fresh water, public health, safety or the environment that may result from the release, fire or explosion (this assessment shall consider both the direct and indirect hazard of the release, fire or explosion);

(11) describe how, if the surface waste management facility stops operations in response to fire, explosion or release, the emergency coordinator will monitor for leaks, pressure buildup, gas generation or rupture in valves, pipes or the equipment, wherever this is appropriate;

(12) describe how the emergency coordinator, immediately after an emergency, will provide for treating, storing or disposing of recovered oil field waste, or other material that results from a release, fire or explosion at a surface waste management facility;

(13) describe how the emergency coordinator will ensure that no oil field waste, which may be incompatible with the released material, is treated, stored or disposed of until cleanup procedures are complete; and

(14) provide that the emergency coordinator may amend the plan during an emergency as necessary to protect fresh water, public health, safety or the environment.

Volume II, Section 5; Contingency Plan *provides detailed information in response to 19.15.36.13.N. 1 through 14.*

O. Gas safety management plan. Each operator of a surface waste management facility that includes a landfill shall have a gas safety management plan that describes in detail procedures and methods that will be used to prevent landfill-generated gases from interfering or conflicting with the landfill's operation and protect fresh water, public health, safety and the environment. The plan shall address anticipated amounts and types of gases that may be generated, an air monitoring plan that includes the vadose zone and measuring, sampling, analyzing, handling, control and processing methods. The plan shall also include final post closure monitoring and control options.

Not applicable. The BDI Facility does not include a landfill.

P. Training program. Each operator shall conduct an annual training program for key personnel that includes general operations, permit conditions, emergencies proper sampling methods and identification of exempt and non-exempt waste and hazardous waste. The operator shall maintain records of such training, subject to division inspection, for five years.

BDI will comply with this requirement. ***Volume II, Section 1, Operation, Inspection, and Maintenance Plan*** *describes in detail the annual training program for site personnel. The training records will be maintained for Division inspection for a period of not less than five years.*

19.15.36.17 SPECIFIC REQUIREMENTS APPLICABLE TO EVAPORATION, STORAGE, TREATMENT AND SKIMMER PONDS:

A. Engineering design plan. An applicant for a surface waste management facility permit or modification requesting inclusion of a skimmer pit; an evaporation, storage or treatment pond; or a below-grade tank shall submit with the surface waste management facility permit application a detailed engineering design plan, certified by a registered profession engineer, including operating and maintenance procedures; a closure plan; and a hydrologic report that provides sufficient information and detail on the site's topography, soils, geology, surface hydrology and ground water hydrology to enable the division to evaluate the actual and potential effects on soils, surface water and ground water. The plan shall include detailed information on dike protection and structural integrity; leak detection, including an adequate fluid collection and removal system; liner specifications and compatibility; freeboard and overtopping prevention; prevention of nuisance and hazardous odors such as H2S; an emergency response plan, unless the pit is part of a surface waste management facility that has an integrated contingency plan; type of oil field waste stream, including chemical analysis; climatological factors, including freeze-thaw cycles; a monitoring and inspection plan; erosion control; and other pertinent information the division requests.

***Volume III, Engineering Design and Calculations**, certified by I. Keith Gordon, P. E., provides the detailed engineering design plan which includes:*

- *liner details*
- *calculations detailing dike protection and structural integrity*
- *leak detection system*
- *liner specifications and compatibility documentation*
- *freeboard and overtopping (wave action) analysis*
- *erosion control*
- *fluid collection and removal system*

***Volume II, Facility Management Plans** describes:*

- *operation and maintenance procedures*
- *C/PC Plan*
- *H_2S Prevention and Contingency Plan*
- *emergency response plan*
- *monitoring and inspection plan*
- *oil field waste management plan*
- *Contingency Plan*
- *chemical analysis*

***Volume IV, Siting and Hydrogeology** describes:*

- *site topography*
- *soils*
- *geology*
- *surface hydrology*
- *groundwater hydrology*
- *climatology*

B. Construction, standards.

(1) In general. The operator shall ensure each pit, pond and below-grade tank is designed, constructed and operated so as to contain liquids and solids in a manner that will protect fresh water, public health, safety and the environment.

***Volume III, Section 2; Liner Construction Quality Assurance Plan** provides detailed procedures for the proper construction of the berms and liner system in compliance with the Permit Plans. The liner system and CQA plan are designed to protect fresh water, safety, and the environment and are certified by a registered professional engineer specializing in geosynthetics.*

(2) Liners required. Each pit or pond shall contain, at a minimum, a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions.

BDI will comply with this requirement. ***Volume III, Engineering Design and Calculations*** *provides detail for the primary liner, secondary liner, and leak detection system in compliance with these requirements.*

(3) Liner specifications. Liners shall consist of a 30-mil flexible PVC or 60-mil HDPE liner, or an equivalent liner approved by the division. Synthetic (geomembrane) liners shall have a hydraulic conductivity no greater than 1 x 10^{-9} cm/sec. Geomembrane liners shall be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions. Liner materials shall be resistant to ultraviolet light, or the operator shall make provisions to protect the material from sunlight. Liner compatibility shall comply with EPA SW-846 method 9090A.

A liner design consistent with Section 19.15.36.17.B.(3) will be constructed at the Facility. The liner design will employ the prescriptive 60-mil high-density polyethylene (HDPE) liner as the upper component and the lower component of the liner system. The leak detection system will consist of a 200-mil geonet installed between the upper and secondary liner system that will drain to the sump areas.

The liner system is shown on the ***Permit Plans (Volume III, Section 1)****; and the BDI* ***Liner Construction Quality Assurance (CQA) Plan (Volume III, Section 2)*** *provides geosynthetics specifications; and compatibility documentation is demonstrated in* ***Volume III, Section 3****.*

(4) Alternative liner media. The division may approve other liner media if the operator demonstrates to the division's satisfaction that the alternative liner protects fresh water, public health, safety and the environment as effectively as the specified media.

The liner option design will employ the prescriptive 60-mil high-density polyethylene (HDPE) liner as the upper component and a lower component of the liner system consisting of a 60-mil HDPE. The alternative leak detection system will consist of a 200-mil geonet installed between the upper and secondary liner system draining towards the sump areas.

(5) Each pit or pond shall have a properly constructed foundation or firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities, in order to prevent rupture or tear of the liner and an adequate anchor trench; and shall be constructed so that the inside grade of the levee is no steeper than 2H:1V. Levees shall have an outside grade no steeper than 3H:1V. The levees' tops shall be wide enough to install an anchor trench and provide adequate room for inspection and maintenance. The operator shall minimize liner seams and orient them up and down, not across a slope. The operator shall use factory seams where possible. The operator shall ensure field seams in geosynthetic material are thermally seamed (hot wedge) with a double track weld to create an air pocket for non-destructive air channel testing. A stabilized air pressure of 35 psi, plus or minus one percent, shall be maintained for at least five minutes. The operator shall overlap liners four to six inches before seaming, and orient seams parallel to the line of maximum slope, i.e., oriented along, not across, the slope. The operator shall minimize the number of field seams in corners and irregularly shaped areas. There shall be no horizontal seams within five feet of the slope's toe. Qualified personnel shall perform field seaming.

*The **Engineering Design (Volume III, Section 1)** and **Liner Construction Quality Assurance (CQA) Plan (Volume III, Section 2)** provide detailed specifications for the installation of geosynthetics in compliance with this section, including:*

- *Foundation preparation*
- *Maximum (3:1) and minimum slopes (2%)*
- *Thermal seaming and testing procedures*
- *Field seams that will be oriented parallel to the line of maximum slope.*
- *Minimizing the number of field seams in corners and irregularly shaped areas.*
- *No horizontal seams within five feet of the toe of slope.*

All liner systems will be installed by qualified contractors with a least 10 million square feet of geosynthetic installation experience.

(6) At a point of discharge into or suction from the lined pit, the liner shall be protected from excessive hydrostatic force or mechanical damage, and external discharge lines shall not penetrate the liner.

*The liner details shown on the **Permit Plans (Volume III, Section 1)** indicate the methods used to protect the liner. To address the hydrostatic forces and potential mechanical damage to the primary liner as a result of pumping into or suction out of the lined ponds, an additional sheet of 60-mil HDPE liner will be welded overtop of the primary liner in the*

*areas that these activities are expected to occur. The **Permit Plans** (Sheet 3, Grading Plan) have been updated to show the location of the additional 60-mil HDPE layer.*

(7) Primary liners shall be constructed of a synthetic material.

See response to 19.15.36.17.B.(3).

(8) A secondary liner may be a synthetic liner or an alternative liner approved by the division. Secondary liners constructed with compacted soil membranes, i.e., natural or processed clay and other soils, shall be at least three feet thick, placed in six-inch lifts and compacted to 95 percent of the material's standard proctor density, or equivalent. Compacted soil membranes used in a liner shall undergo permeability testing in conformity with ASTM standards and methods approved by the division before and after construction. Compacted soil membranes shall have a hydraulic conductivity of no greater than 1 x 10^{-8} cm/sec. The operator shall submit results of pre-construction testing to the division for approval prior to construction.

BDI is not proposing a secondary alternate liner constructed of a soil component. BDI is proposing to utilize a secondary liner option consisting of 60-mil HDPE. See response to 19.15.36.17.B.(4).

(9) The operator shall place a leak detection system between the lower and upper geomembrane liners that consists of two feet of compacted soil with a saturated hydraulic conductivity of 1 x 10^{-5} cm/sec or greater to facilitate drainage. The leak detection system shall consist of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped so as to facilitate the earliest possible leak detection. Piping used shall be designed to withstand chemical attack from oil field waste or leachate; structural loading from stresses and disturbances from overlying oil field waste, cover materials, equipment operation or expansion or contraction; and to facilitate clean-out maintenance. The material placed between the pipes and laterals shall be sufficiently permeable to allow the transport of fluids to the drainage pipe. The slope of the interior sub-grade and of drainage lines and laterals shall be at least a two percent grade, i.e., two feet vertical drop per 100 horizontal feet. The piping collection system shall be comprised of solid and perforated pipe having a minimum diameter of four inches and a minimum wall thickness of schedule 80. The operator shall seal a solid sidewall riser pipe to convey collected fluids to a collection, observation and disposal system located outside the perimeter of the pit or pond. The operator may install alternative methods as approved by the division.

BDI is proposing to install a leak detection system consisting of a 200-mil geonet between the primary and secondary liners. The geocomposite will have a minimum hydraulic conductivity (-k) of 10 cm/sec. Calculations, compatibility, and technical properties of the leak detection system are included in ***Volume III, Engineering Design and Calucations. Permit Plans (Volume III, Section 1)*** *provides design elements of the leak detection system including:*

- *Minimum 2% slope on the liner and leak detection system*
- *Solid and perforated pipe details*
- *Sump and riser pipe*
- *Composite liner (i.e., FML/GCL) under each leak detection sump*

The ***Engineering Design (Volume III, Section 1)*** *and the* ***Permit Plans*** *provide detailed specifications for the piping collection systems demonstrating that the materials exceed the prescriptive standards.*

(10) The operator shall notify the division at least 72 hours prior to the primary liner's installation so that a division representative may inspect the leak detection system before it is covered.

BDI will provide a milestone schedule in advance of liner construction and notify the Division at least 72 hours prior to the primary liner installation.

(11) The operator shall construct pits and ponds in a manner that prevents overtopping due to wave action or rainfall, and maintain a three foot freeboard at all times.

BDI will comply with this requirement. ***Volume III, Engineering Design and Calculations*** *provides detailed calculations on wave action, rainfall, and freeboard analysis.*

(12) The maximum size of an evaporation or storage pond shall not exceed 10 acre-feet.

BDI will comply with this requirement. The proposed ponds are each approximately 9.5 acre-feet in capacity, not including freeboard.

C. Operating standards.

(1) The operator shall ensure that only produced fluids or non-hazardous waste are discharged into or stored in a pit or pond; and that no measurable or visible oil layer is allowed to accumulate or remain anywhere on a pit's surface except an approved skimmer pit.

Volume II, Section 2; Oil Field Waste Management Plan *provides detailed procedures to ensure that only produced fluids or non-hazardous waste are placed into or stored in a pit or pond. This Plan also addresses measurable or visible oil layer load rejection procedures.*

(2) The operator shall monitor leak detection systems pursuant to the approved surface waste management facility permit conditions, maintain monitoring records in a form readily accessible for division inspection and report discovery of liquids in the leak detection system to the division within 24 hours.

BDI will comply with this requirement. ***Volume II, Section 1; Operations, Inspection, and Maintenance Plan*** *provides a more detailed description of monitoring, recordkeeping and procedures for management of liquids in the leak detection system.*

(3) Fencing and netting. The operator shall fence or enclose pits or ponds to prevent unauthorized access and maintain fences in good repair. Fences are not required if there is an adequate perimeter fence surrounding the surface waste management facility. The operator shall screen, net, cover or otherwise render non-hazardous to migratory birds tanks exceeding eight feet in diameter and exposed pits and ponds. Upon written application, the division may grant an exception to screening, netting or covering requirements upon the operator's showing that an alternative method will adequately protect migratory birds or that the tank or pit is not hazardous to migratory birds.

The entire perimeter of the BDI facility is enclosed with a six-foot high chain link fence and locking gates. The ***Permit Plans, Volume III, Section 1*** *graphically describe the location of the perimeter fence. BDI requests an alternate method to the migratory bird screening requirement.* ***Volume II, Section 6; Migratory Bird Protection Plan*** *describes the alternate methodology to the screening requirement of the storage ponds. This Plan describes visual inspections and migratory bird retrieval and clean-up procedures should bird(s) require decontamination.*

(4) The division may approve spray systems to enhance natural evaporation. The operator shall submit engineering designs for spray systems to the division's environmental bureau for approval prior to installation. The operator shall ensure that spray evaporation systems are operated so that spray-borne suspended or dissolved solids remain within the perimeter of the pond's lined portion.

BDI proposes to install spray system(s) to enhance natural evaporation in the new ponds. ***Volume II, Section 1; Operations, Inspection, and Maintenance Plan*** *provides the design, operation and maintenance of the proposed system. The spray system is designed to prevent spray-borne suspended or dissolved solids from exiting the perimeter of the pond's liner area. In addition, this system will not be operated when wind velocity exceeds fifteen miles per hour (sustained) via automatic shut-off mechanisms.*

(5) The operator shall use skimmer pits or tanks to separate oil from produced water prior to water discharge into a pond. The operator shall install a trap device in connected ponds to prevent solids and oils from transferring from one pond to another unless approved in the surface waste management facility permit.

BDI utilizes skimmed oil and oily water receiving tanks to process water received at the facility that requires separation of oil from water as described in ***Volume II, Section 1; Operations, Inspection, and Maintenance Plan****. In addition, a 20 um filter is placed in-line from the first evaporation pond to the injection well. Prior to transfer from the primary receiving pond to the two additional ponds, or to the injection well, liquids are further treated with a 5 um filter. In combination, these filters prevent solids or oils from transferring from one pond to another.*

D. Below-grade tanks and sumps.

(1) The operator shall construct below-grade tanks with secondary containment and leak detection. The operator shall not allow below-grade tanks to overflow. The operator shall install only below-grade tanks of materials resistant to the tank's particular contents and to damage from sunlight.

(2) The operator shall test sumps' integrity annually, and shall promptly repair or replace a sump that does not demonstrate integrity. The operator may test sumps that can be removed from their emplacements by visual inspection. The operator shall test other sumps by appropriate mechanical means. The operator shall maintain records of sump

inspection and testing and make such records available for division inspection.

BDI has two below-grade sumps at the Facility, with the most recent being the pump house sump. The pump house tank is constructed of concrete and has a concrete secondary containment and leak detection systems as required. In addition, the secondary concrete tank is contained in a 30-mil HDPE envelope creating a third protective barrier. The south sump for the receiving tanks will be upgraded to the same design as part of this Application. The steel construction ensures the tanks are resistant to the liquid waste and sunlight. BDI has and will continue to confirm visually the sumps' integrity, and will maintain records of inspection and maintenance. These records will be made available for Division inspection upon request. ***Volume II, Section 1; Operations, Inspection, and Maintenance Plan*** *describes in detail the inspection and maintenance of the below-grade sumps.*

E. Closure required. The operator shall properly close pits, ponds and below-grade tanks within six months after cessation of use.

BDI will comply with this requirement, ***Volume II, Section 4; Closure/Post Closure Plan*** *describes in detail closure timeframes.*

19.15.36.18 CLOSURE AND POST CLOSURE:

A. Surface waste management facility closure by operator.

(1) The operator shall notify the division's environmental bureau at least 60 days prior to cessation of operations at the surface waste management facility and provide a proposed schedule for closure. Upon receipt of such notice and proposed schedule, the division shall review the current closure plan for adequacy and inspect the surface waste management facility.

BDI will comply with this requirement. ***Volume II, Section 4; Closure/Post Closure Plan*** *describes in detail closure notification requirements.*

(2) The division shall notify the operator within 60 days after the date of cessation of operations specified in the operator's closure notice of modifications of the closure plan and proposed schedule or additional requirements that it determines are necessary for the protection of fresh water, public health, safety or the environment.

No response required.

(3) If the division does not notify the operator of additional closure requirements within 60 days as provided, the operator may proceed with closure in accordance with the approved closure plan; provided that the director may, for good cause, extend the time for the division's response for an additional period not to exceed 60 days by written notice to the operator.

BDI will comply with this requirement.

(4) The operator shall be entitled to a hearing concerning a modification or additional requirement the division seeks to impose if it files an application for a hearing within 10 days after receipt of written notice of the proposed modifications or additional requirements.

BDI will comply with this requirement.

(5) Closure shall proceed in accordance with the approved closure plan and schedule and modifications or additional requirements the division imposes. During closure operations the operator shall maintain the surface waste management facility to protect fresh water, public health, safety and the environment.

BDI will comply with this requirement.

(6) Upon completion of closure, the operator shall re-vegetate the site unless the division has approved an alternative site use plan as provided in Subsection G of 19.15.36.18 NMAC. Re-vegetation, except for landfill cells, shall consist of establishment of a vegetative cover equal to 70 percent of the native perennial vegetative cover (un-impacted by overgrazing, fire or other intrusion damaging to native vegetation) or scientifically documented ecological description consisting of at least three native plant species, including at least one grass, but not including noxious weeds, and maintenance of that cover through two successive growing seasons.

BDI will comply with this requirement. ***Volume II, Section 4; Closure/Post Closure Plan*** *describes in detail re-vegetation and maintenance plans for the Facility.*

B. Release of financial assurance.

(1) When the division determines that closure is complete it shall release the financial assurance, except for the amount needed to maintain monitoring

wells for the applicable post closure care period, to perform semi-annual analyses of such monitoring wells and to re-vegetate the site. Prior to the partial release of the financial assurance covering the surface waste management facility, the division shall inspect the site to determine that closure is complete.

Volume II, Section 4; Closure/Post Closure Plan *provides the estimated amount, in current dollars, required for the PC care and maintenance.*

(2) After the applicable post closure care period has expired, the division shall release the remainder of the financial assurance if the monitoring wells show no contamination and the re-vegetation in accordance with Paragraph (6) of Subsection A of 19.15.36.18 NMAC is successful. If monitoring wells or other monitoring or leak detection systems reveal contamination during the surface waste management facility's operation or in the applicable post closure care period following the surface waste management facility's closure the division shall not release the financial assurance until the contamination is remediated in accordance with 19.15.30 or 19.15.29 NMAC, as applicable.

BDI will comply with this requirement.

(3) In any event, the division shall not finally release the financial assurance until it determines that the operator has successfully re-vegetated the site in accordance with Paragraph (6) of Subsection A of 19.15.36.18 NMAC, or, if the division has approved an alternative site use plan, until the landowner has obtained the necessary regulatory approvals and begun implementation of the use.

No response required.

C. Surface waste management facility closure initiated by the division. Forfeiture of financial assurance.

(1) For good cause, the division may, after notice to the operator and an opportunity for a hearing, order immediate cessation of a surface waste management facility's operation when it appears that cessation is necessary to protect fresh water, public health, safety or the environment, or to assure compliance with statutes or division rules and orders. The division may order closure without notice and an opportunity for hearing in the event of an emergency, subject to NMSA 1978, Section 70-2-23, as amended.

Not applicable.

(2) If the operator refuses or is unable to conduct operations at a surface waste management facility in a manner that protects fresh water, public health, safety and the environment; refuses or is unable to conduct or complete an approved closure plan; is in material breach of the terms and conditions of its surface waste management facility permit; or the operator defaults on the conditions under which the division accepted the surface waste management facility's financial assurance; or if disposal operations have ceased and there has been no significant activity at the surface waste management facility for six months the division may take the following actions to forfeit all or part of the financial assurance:

(a) send written notice by certified mail, return receipt requested, to the operator and the surety, if any, informing them of the decision to close the surface waste management facility and to forfeit the financial assurance, including the reasons for the forfeiture and the amount to be forfeited, and notifying the operator and surety that a hearing request or other response shall be made within 10 days of receipt of the notice; and

(b) advise the operator and surety of the conditions under which they may avoid the forfeiture; such conditions may include but are not limited to an agreement by the operator or another party to perform closure and post closure operations in accordance with the surface waste management facility permit conditions, the closure plan (including modifications or additional requirements imposed by the division) and division rules, and satisfactory demonstration that the operator or other party has the ability to perform such agreement.

BDI will cooperate with the Division concerning this requirement and does not foresee any instance in will the facility will not be operated in compliance with the Permit or Permit Conditions.

(3) The division may allow a surety to perform closure if the surety can demonstrate an ability to timely complete the closure and post closure in accordance with the approved plan.

No response required.

(4) If the operator and the surety do not respond to a notice of proposed forfeiture within the time provided, or fail to satisfy the specified conditions for non-forfeiture, the division shall proceed, after hearing if the operator or surety has timely requested a hearing, to declare the financial assurance's forfeiture. The division may then proceed to collect the forfeited amount and use the funds to complete the closure, or, at the

division's election, to close the surface waste management facility and collect the forfeited amount as reimbursement.

(a) The division shall deposit amounts collected as a result of forfeiture of financial assurance in the oil and gas reclamation fund.

(b) In the event the amount forfeited and collected is insufficient for closure, the operator shall be liable for the deficiency. The division may complete or authorize completion of closure and post closure and may recover from the operator reasonably incurred costs of closure and forfeiture in excess of the amount collected pursuant to the forfeiture.

(c) In the event the amount collected pursuant to the forfeiture was more than the amount necessary to complete closure, including remediation costs, and forfeiture costs, the division shall return the excess to the operator or surety, as applicable, reserving such amount as may be reasonably necessary for post closure monitoring and re-vegetation in accordance with Paragraph (6) of Subsection A of 19.15.36.18 NMAC. The division shall return excess of the amount retained over the actual cost of post closure monitoring and re-vegetation to the operator or surety at the later of the conclusion of the applicable post closure period or when the site re-vegetation in accordance with Paragraph (6) of Subsection A of 19.15.36.18 NMAC is successful.

No response required.

(5) If the operator abandons the surface waste management facility or cannot fulfill the conditions and obligations of the surface waste management facility permit or division rules, the state of New Mexico, its agencies, officers, employees, agents, contractors and other entities designated by the state shall have all rights of entry into, over and upon the surface waste management facility property, including all necessary and convenient rights of ingress and egress with all materials and equipment to conduct operation, termination and closure of the surface waste management facility, including but not limited to the temporary storage of equipment and materials, the right to borrow or dispose of materials and all other rights necessary for the surface waste management facility's operation, termination and closure in accordance with the surface waste management facility permit and to conduct post closure monitoring.

No response required.

E. Pond and pit closure. The operator shall ensure that:

(1) liquids in the ponds or pits are removed and disposed of in a division-approved surface waste management facility;

(2) **liners are disposed of in a division-approved surface waste management facility;**

(3) **equipment associated with the surface waste management facility is removed;**

(4) **the site is sampled, in accordance with the procedures specified in chapter nine of EPA publication SW-846, test methods for evaluating solid waste, physical/chemical methods for TPH, BTEX, metals and other inorganics listed in Subsections A and B of 20.6.2.3103 NMAC, in accordance with a gridded plat of the site containing at least four equal sections that the division has approved; and**

(5) **sample results are submitted to the environmental bureau in the division's Santa Fe office.**

BDI will comply with this requirement. ***Volume II, Section 4; Closure/Post Closure Plan*** *describes in detail liquid, liner and equipment disposal; as well as sampling, testing, and reporting when closure of the Facility is conducted.*

F. Landfarm and pond and pit post closure. The post-closure care period for a landfarm or pond or pit shall be three years if the operator has achieved clean closure. During that period the operator or other responsible entity shall regularly inspect and maintain required re-vegetation. If there has been a release to the vadose zone or to ground water, then the operator shall comply with the applicable requirements of 19.15.30 NMAC and 19.15.29 NMAC.

No response required.

G. Alternatives to re-vegetation. If the landowner contemplates use of the land where a cell or surface waste management facility is located for purposes inconsistent with re-vegetation, the landowner may, with division approval, implement an alternative surface treatment appropriate for the contemplated use, provided that the alternative treatment will effectively prevent erosion. If the division approves an alternative to re-vegetation, it shall not release the portion of the operator's financial assurance reserved for post-closure until the landowner has obtained necessary regulatory approvals and begun implementation of such alternative use.

If applicable, BDI will comply with this requirement.

19.15.36.19 EXCEPTIONS AND WAIVERS:

A. In a surface waste management facility permit application, the applicant may propose alternatives to requirements of 19.15.36 NMAC, and the division may approve such alternatives if it determines that the proposed alternatives will

provide equivalent protection of fresh water, public health, safety and the environment.

BDI is not requesting alternatives to the requirements beyond the flexibility provided in 19.15.36.

B. The division may grant exceptions to, or waivers of, or approve alternatives to requirements of 19.15.36 NMAC in an emergency without notice or hearing. The operator requesting an exception or waiver, except in an emergency, shall apply for a surface waste management facility permit modification in accordance with Subsection C of 19.15.36.8 NMAC. If the requested modification is a major modification, the operator shall provide notice of the request in accordance with 19.15.36.9 NMAC.

BDI will comply with this requirement.

19.15.36.20 TRANSITIONAL PROVISIONS:

Existing permitted facilities. Surface waste management facilities in operation prior to the effective date of 19.15.36 NMAC pursuant to division permits or orders may continue to operate in accordance with such permits or orders, subject to the following provisions.

A. Existing surface waste management facilities shall comply with the operational, waste acceptance and closure requirements provided in 19.15.36 NMAC, except as otherwise specifically provided in the applicable permit or order, or in a specific waiver, exception or agreement that the division has granted in writing to the particular surface waste management facility.

BDI is complying with this requirement.

B. Major modification of an existing surface waste management facility and a new landfarm cells constructed at an existing surface waste management facility shall comply with the requirements provided in 19.15.36 NMAC.

Submittal of this Application complies with this requirement.

C. The division shall process an application for a surface waste management facility permit filed prior to May 18, 2006 in accordance with 19.15.9.711 NMAC, and an application filed after May 18, 2006 in accordance with 19.15.36 NMAC.

No response required.

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME I: PERMIT APPLICATION TEXT
PART 36: SURFACE WASTE MANAGEMENT FACILITIES

ATTACHMENT A

1999 PERMIT APPROVAL

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

May 17, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-515

Mr. Jerry Sandel
Basin Disposal, Inc.
P.O. Box 100
Aztec, New Mexico 87401

RE: OCD Rule 711 Permit Approval (NM-01-0005)
Basin Disposal, Inc.
Commercial Surface Waste Management Facility
SE/4 NW/4 of Section 3, Township 29 North, Range 11 West, NMPM,
San Juan County, New Mexico

Dear Mr. Sandel:

The permit application for the Basin Disposal, Inc. (Basin) commercial surface waste management facility located in the SE/4 NW/4 of Section 3, Township 29 North, Range 11 West, NMPM, San Juan County, New Mexico is hereby approved in accordance with New Mexico Oil Conservation Division (OCD) Rule 711 under the conditions contained in the enclosed attachment. **This permit approval is conditional upon the receipt and approval by the Director of financial assurance in the amount of $120,000.** According to the schedule outlined in the financial assurance section of the enclosed attachment, 25% of the $120,000 financial assurance ($30,000) is required within thirty (30) days of the date of this permit approval letter. The application consists of the permit application Form C-137 dated November 5, 1997, inspection report response letter dated November 4, 1997, supplemental materials dated February 18, 1998, January 12, 1999, January 15, 1999, and February 15, 1999; materials from the original permit application dated August 15, 1985; and permit modification dated September 3,1992.

The construction, operation, monitoring and reporting shall be as specified in the enclosed attachment. All modifications and alternatives to the approved treatment, evaporation and landfill methods must receive prior OCD approval. Basin is required to notify the Director of any facility expansion or process modification and to file the appropriate materials with the Division.

Please be advised approval of this facility permit does not relieve Basin Disposal, Inc. of liability

should your operation result in actual pollution of surface water, ground water, or the environment. In addition, OCD approval does not relieve Basin Disposal, Inc. of responsibility for compliance with other federal, state or local laws and/or regulations.

Please be advised that all tanks exceeding 16 feet in diameter and exposed pits, ponds or lagoons must be screened, netted or otherwise rendered non-hazardous to migratory birds. In addition, OCD Rule 310 prohibits oil from being stored or retained in earthen reservoirs or open receptacles.

The Basin Disposal, Inc. Commercial Surface Waste Management Facility Permit NM-01-0005 will be reviewed at least once every five (5) years from the date of this approval letter. The facility is subject to periodic inspections by the OCD.

Enclosed are two copies of the conditions of approval. **Please sign and return one copy to the OCD Santa Fe Office within five working days of receipt of this letter.**

If you have any questions please do not hesitate to contact Martyne J. Kieling at (505) 827-7153.

Sincerely,

Lori Wrotenbery

Lori Wrotenbery
Director

LW/mjk

xc with attachments:
Aztec OCD Office

ATTACHMENT TO OCD 711 PERMIT APPROVAL
PERMIT NM-01-0005
BASIN DISPOSAL, INC.
WASTE MANAGEMENT FACILITY
SE/4 NW/4 of Section 3, Township 29 North, Range 11 West, NMPM,
San Juan County, New Mexico
(May 17, 1999)

FACILITY AND EVAPORATION POND OPERATION

1. The facility must be fenced and have a sign at the entrance. The sign must be legible from at least fifty (50) feet and contain the following information: a) name of the facility; b) location by section, township and range; and c) emergency phone number.

2. Disposal may occur only when an attendant is on duty. The facility must be secured when no attendant is present.

3. No produced water may be received at the facility unless the transporter has a valid Form C-133, Authorization to Move Produced Water, on file with the Division.

4. All produced water must be unloaded into tanks. The produced water must reside in the tank system long enough to allow for oil and sediment separation. Oil recovered must be stored in above ground storage tanks. Per Division General Rule 310, oil shall not be stored or retained in earthen reservoirs or in open receptacles.

5. All existing above-ground tanks located at the facility and containing materials other than fresh water must be bermed to contain one and one-third the volume of the largest tank or all interconnected tanks, whichever is greater. All above-ground tanks must be labeled as to contents and hazards.

6. All new or replacement above-ground tanks containing materials other than fresh water must be placed on an impermeable pad and be bermed so that the area will hold one and one-third the volume of the largest tank or all interconnected tanks, whichever is greater.

7. Below-grade sumps must be cleaned and visually inspected annually. Results must be recorded and maintained for OCD review. If sump integrity has failed the OCD must be notified within 48 hours of discovery and the sump contents and contaminated soil must be removed and disposed of at an OCD-approved facility. Soil remediation must follow OCD surface impoundment closure guidelines. The permittee must submit a report to the OCD Santa Fe and appropriate District offices that describes the investigation and remedial actions taken.

8. All new or replacement below-grade sumps and below-grade tanks at the facility must have secondary impermeable containment with a leak detection monitoring system. Monitoring of the secoundary containment system must be inspected for fluids weekly. Results must be recorded and maintained for OCD review. If fluids are present they must be checked and the analyses must be furnished to the OCD Santa Fe and appropriate District offices.

9. The produced water receiving and treatment area must be inspected daily for tank, piping and berm integrity.

10. Any design changes to the produced water receiving, treatment and evaporation area must submitted to the OCD Santa Fe office for approval.

11. The pond must have a minimum freeboard of two (2) feet. A device must be installed in the pond to accurately measure freeboard.

12. The pond may not contain any free oil.

13. Pond inspection and maintenance must be conducted on a daily basis or immediately following a consequential rainstorm or windstorm. If any defect is noted repairs must be made as soon as possible. If the defect will jeopardize the integrity of the pond additional wastes must not be placed into the pond until repairs have been completed.

14. The leak detection system must be inspected daily and if fluid is present samples of the fluid must be compared with the fluids in the pond. Results must be recorded and maintained for OCD review. If pond and leak detection fluids are similar the OCD Santa Fe and appropriate District offices must be notified within 48 hours. Within 72 hours of discovery, the permittee must submit a plan to the OCD Santa Fe and appropriate District offices that describes what procedures will be taken to investigate and repair the leak. Upon discovery all fluids must be removed from the leak detection system. The system must be kept free of fluids.

15. Sludge thickness in the base of the pond must be measured annually. Any sludge build-up in the bottom of the pond in excess of twelve (12) inches must be removed and disposed of at an OCD-approved facility.

16. To protect migratory birds, all tanks exceeding 16 feet in diameter and exposed pits, ponds or lagoons must be screened, netted, covered or otherwise rendered nonhazardous to migratory birds.

17. Liquid reduction technologies that may be used to eliminate pond waters include evaporation, enhanced evaporation and injection at the facility Class II disposal well.

18. At such time that the spray system is utilized to enhance evaproation the following

18. At such time that the spray system is utilized to enhance evaproation the following requirements will apply:

    a. The spray system must be operated such that all spray remains within the confines of the lined portion of the pond; and

    b. The spray system must be operated only when an attendant is on duty and during daylight hours.

TEMPORARY PIT CONSTRUCTION AND CLOSURE

1. Two temporary pits may be constructed to the north of the evaporation pond facility and must be contained within the facility fence. Pit #1 may be used only for temporary storage of produced water from the produced water treatment system and from the evaporation pond while sludge is removed and the pond liner is inspected and any repairs are made. Produced water may be transferred from Pit #1 to the Class II injection well. Pit # 2 may be used only for temporary storage and drying of sludge removed from the evaporation pond and pit #1.

2. The temporary pits will be approximately 150 feet by 300 feet by 4 feet deep and must be lined with a 20 ml or greater liner.

3. The bed of the temporary pit and inside grade of the levee must be smooth and compacted, free of holes, rocks, stumps, clods or any other debris which may rupture the liner.

4. A trench must be excavated on the top of the levee the entire perimeter of the pit for the purpose of anchoring the liner. This trench must be located a minimum of nine (9) inches from the slope break and must be a minimum of twelve (12) inches deep.

5. Pit # 1 must have a minimum freeboard of one and a half (1½) feet. A device must be installed in the pond to accurately measure freeboard.

6. Pit inspection and maintenance must be conducted on a daily basis or immediately following a consequential rainstorm or windstorm. If any defect is noted the OCD Santa Fe and appropriate District offices must be notified within 24 hours. Within 48 hours of discovery, the permittee must submit a plan to the OCD Santa Fe and appropriate District offices that describes what procedures will be taken to investigate and repair any defect. Repairs must be made as soon as possible. If the defect will jeopardize the integrity of the pit additional wastes may not be placed into the temporary pit and existing waste may need to be removed from the pit until repairs have been completed.

completely emptied of produced water, all sludge must be transferred to pit #2, and the liner must be removed and disposed of at an OCD-approved facility. The OCD Santa Fe and appropriate District offices must be notified in writing of final pit closure.

8. Pit #2 is permitted for 180 days from construction completion. Upon closure the sludge must be disposed of at an OCD-approved facility and the liner must be removed and disposed of at an OCD-approved facility. The OCD Santa Fe and appropriate District offices must be notified in writing of final pit closure.

9. The facility may request in writing to the OCD Santa Fe office that the authorization for the temporary pits be reactivated for future evaporation pond cleaning and repairs.

H_2S PREVENTION & CONTINGENCY PLAN

1. In order to prevent development of harmful concentrations of H_2S, the following procedures must be followed:

   a. All incoming loads of produced water must be tested for hydrogen sulfide (H_2S) concentrations. Any loads with measurable H_2S concentrations will be treated in a closed system. The treatment reaction must be driven to completion to eliminate all measurable H_2S prior to disposal of the water into the pond.

   b. The aeration system must be operated to provide sufficient oxygen to the pond to maintain a residual oxygen concentration of 0.5 ppm one foot off the bottom of the pond. Tests must be conducted and records made and maintained of the dissolved oxygen levels in the pond according to the following procedures:

      i. Tests must be conducted daily.

      ii. The sample for each test must be taken one foot from the bottom of the pond.

      iii. The location of tests must vary around the pond.

      iv. If any test shows a dissolved residual oxygen level of less than 0.5 ppm, immediate steps will be undertaken to oxygenate the pond and create a residual oxygen level of at least 0.5 ppm. Remedial measures may include adding chemicals or increasing aeration.

   c. Daily tests must be conducted and records made and maintained of the pH levels in the pond, and if the pH falls below 8.0 remedial steps must be taken immediately to raise the pH.

raise the pH.

d. Weekly tests must be conducted and records made and retained at the facility of the dissolved sulfide concentrations in the pond.

e. At least 1000 gallons of a H_2S treatment chemical must be stored on-site and must not be retained for a period in excess of the manufacturer's stated shelf life. Expired H_2S treatment chemicals may be disposed of in the pond.

2. Tests of ambient H_2S levels must be conducted twice per day. Test results must be recorded and retained. The tests must be conducted at four (4) locations around the pond at the top of the berm. The wind speed and direction must be recorded in conjunction with each test.

a. If an H_2S reading of 1.0 ppm or greater is obtained:

i. a second reading must be taken on the downwind berm within one hour;

ii. the dissolved oxygen and dissolved sulfide levels of the pond must be tested immediately and the need for immediate treatment determined; and

iii. tests for H_2S levels must be made at the fence line down wind from the problem pond.

b. If two (2) consecutive H_2S readings of 1.0 ppm or greater are obtained:

i. the operator must notify the Aztec office of the OCD immediately;

ii. the operator must commence hourly monitoring on a 24-hour basis;

iii. the operator must lower the pond level so that the aeration system will circulate the entire pond; and

iv. the operator must obtain daily analyses of dissolved sulfides in the pond.

c. If an H_2S reading of 10.0 ppm or greater at the facility fence line is obtained:

i. the operator must immediately notify the Aztec office of the OCD and the following public safety agencies:

New Mexico State Police
San Juan County Sheriff
San Juan County Fire Marshall; and

ii. the operator must ~~notify all~~ persons residing with in one-half (½) mile of the fence line and assist public safety officials with evacuation as requested.

WASTE ACCEPTANCE CRITERIA

1. The facility is authorized to accept only oilfield wastes that are exempt from RCRA Subtitle C regulations and that do not contain Naturally Occurring Radioactive Material (NORM) regulated pursuant to 20 NMAC 3.1 Subpart 1403. All loads of these wastes received at the facility must be accompanied by a "Generator Certificate of Waste Status" signed by the generator.

2. At no time may any OCD-permitted surface waste management facility accept wastes that are determined to be RCRA Subtitle C hazardous wastes by either listing or characteristic testing.

3. The transporter of any wastes to the facility must supply a certification that wastes delivered are those wastes received from the generator and that no additional materials have been added.

4. No produced water may be received at the facility from motor vehicles unless the transporter has a valid Form C-133, "Authorization to Move Produced Water" on file with the Division.

5. Comprehensive records of all material disposed of at the surface waste management facility must be maintained by the Basin Disposal, Inc.

REPORTING AND RECORD KEEPING

1. Results of the daily inspection/testing of the leak detection system must be recorded and an ~~annual report must be submitted~~ to the OCD Santa Fe office for review **by May 17 of each year**.

2. Results of the daily visual inspection of the facility must be recorded and maintained for OCD review.

3. Results of the testing at the evaporation pond for H_2S, pH, dissolved sulfides, and dissolved oxygen must be recorded and maintained for OCD review.

4. Results of the weekly inspections of the below-grade tank and sump secondary containment systems must be recorded and maintained for OCD review.

5. Results of annual inspection and maintenance on below-grade sumps and annual measurements of sludge thickness in the pond must be recorded and maintained for OCD review.

6. The applicant must notify the **OCD Aztec District office within 24 hours** of any fire, break, leak, spill, blowout or any other circumstance that could constitute a hazard or contamination in accordance with OCD Rule 116.

7. All records of testing and monitoring must be retained for a period of five (5) years.

8. The OCD must be notified prior to the installation of any pipelines or wells or other structures within the boundaries of the facility.

9. Comprehensive records of all material disposed of at the facility must be maintained at the facility. The records for each load must include: 1) generator; 2) origin; 3) date received; 4) quantity; and 5) transporter.

FINANCIAL ASSURANCE

1. Financial assurance in the amount of **$120,000** (the estimated cost of closure) in the form of a surety or cash bond or a letter of credit, which is approved by the Division, is required from Basin Disposal, Inc. for the commercial surface waste management facility.

   By June 17, 1999 Basin Disposal, Inc. must submit 25% of the financial assurance in the amount of **$30,000.**

   By June 17, 2000 Basin Disposal, Inc. must submit 50% of the financial assurance in the amount of **$60,000.**

   By June 17, 2001 Basin Disposal, Inc. must submit 75% of the financial assurance in the amount of **$90,000.**

   By June 17, 2002 Basin Disposal, Inc. must submit 100% of the financial assurance in the amount of **$120,000.**

2. The facility is subject to periodic inspections by the OCD. The conditions of this permit and the facility will be reviewed by the OCD no later than five (5) years from the date of this approval. In addition the closure cost estimate will be reviewed according to prices and remedial work estimates at the time of review. The financial assurance may be adjusted to incorporate any closure cost changes.

CLOSURE

1. The OCD Santa Fe and Aztec offices must be notified when operation of the facility is discontinued for a period in excess of six (6) months or when the facility is to be dismantled. Upon cessation of operations for six (6) consecutive months, the operator must complete cleanup of constructed facilities and restoration of the facility site within the following six (6) months, unless an extension of time is granted by the Director.

2. A closure plan to include the following closure procedures must be submitted to the OCD for approval:

   a. When the facility is to be closed no new material will be accepted.

   b. The evaporation pond will be allowed to evaporate. Any water not evaporated will be hauled to an OCD-approved facility. The pond will be surveyed for NORM.

   c. The pond evaporation equipment, liners and leak detection system will be removed.

   d. All above-grade tanks will be emptied and any waste will be hauled to an OCD-approved facility. The empty tanks will be removed.

   e. The soils beneath the evaporation pond and liquids receiving and treatment area will be characterized as to total petroleum hydrocarbons (TPH) and volatile aromatic organics (BTEX) content to determine potential migration of contamination.

   f. Contaminated soils exceeding OCD closure standards for the site will be removed or remediated.

   g. All above-grade tanks will be emptied and any waste will be hauled to an OCD-approved facility. The empty tanks will be removed

   h. The area will be contoured, seeded with native seed mix and allowed to return to its natural state. If the landowner desires to keep existing structures, berms, and fences for future alternative uses the structures may be left in place.

   i. Closure will be pursuant to all OCD requirements in effect at the time of closure and any other applicable local, state and/or federal regulations.

CERTIFICATION

Basin Disposal, Inc., by the officer whose signature appears below, accepts this permit and agrees to comply with all terms and conditions contained herein. Basin Disposal, Inc. further acknowledges that these conditions and requirements of this permit may be changed administratively by the Division for good cause shown as necessary to protect ground water, surface water, human health and the environment.

Accepted:

BASIN DISPOSAL, INC.

Signature Jerry Sandel Title President Date May 20, 1999

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME I: PERMIT APPLICATION TEXT
PART 36: SURFACE WASTE MANAGEMENT FACILITIES

ATTACHMENT B

PUBLIC NOTIFICATION

Names and Addresses of Real Surface Owners Real Property within 1 mile

Attachment B
Public Notification

Name and Address of Real Surface Owners Real Property within 1 mile

Account No	Parcel Address	Owner	Address	City, State, Zip	2nd Name
R0010518	15731 US 550	CRANE LEE M TRUSTEE	125 S POLLARD	AZTEC, NM 874102073	
R0011580	203 UTAH ST	YOCUM DONALD P SR AND SUE TRUST	PO BOX 188	BLOOMFIELD, NM 87413	
R0013628	N 1ST ST	MOSS JAKIE L AND MARY ANN	P O BOX 343	FLORA VISTA, NM 874150343	
R0013927	3920 N 1ST ST	MOSS RUSSELL W AND MARTHA E	P O BOX 622	FLORA VISTA, NM 87415	
R0014057	UTAH ST	HOLLAR SAMUEL C ET UX	P O BOX 2016	BLOOMFIELD, NM 874132016	
R0014197	3650 N 1ST ST	HOLLAR SAMUEL C ET UX	P O BOX 2016	BLOOMFIELD, NM 874132016	
R0014415	200 UTAH ST	MC CONNEL WILLIAM E AND JERILYN R TRUST	P O BOX 941	AZTEC, NM 874100941	
R0014519	3601 F N 1ST ST	PASCETTI INVESTMENTS LLC	34940 HWY 550 NORTH	DURANGO, CO 81301	
R0014600	325 NM 544	CRANE LEE ANNE AND LEE M JR	P O BOX 83	BLOOMFIELD, NM 874130083	
R0014797	N 1ST ST	YOCUM DONALD P SR AND SUE TRUST	PO BOX 188	BLOOMFIELD, NM 87413	
R0014823	3900 N 1ST ST	WINER STEVEN J AND KATHERINA L	P O BOX 2055	DURANGO, CO 813022055	
R0014824	3782 PROVO	MOSS AGUA LLC	PO BOX 600	FARMINGTON, NM 87499	
R0015381	N 1ST ST	SIMKINS TRUCKING INC	P O BOX 1528	FARMINGTON, NM 87499	
R0070181	191 N 1ST ST	RAY JESSE W	P O BOX 2551	BLOOMFIELD, NM 874132551	
R0070252	18 ILLINOIS	CARTER MARGARET L	P O BOX 681	BLOOMFIELD, NM 874130681	
R0070343	MONTANA	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 874100100	
R0070351	N 1ST ST	ADAMS DONALD C TRUST ETAL	P O BOX 190	AZTEC, NM 87410	C/O CRANE GORDON N JR AND DIANE ETAL
R0070357	N 1ST ST	RAINBOW TRUST	2602 W 16TH ST	PLAIN VIEW, TX 79072	
R0070643	100 MARYLAND	DRAKE TWANA AND LORRAINE	P O BOX 448	FLORA VISTA, NM 87415	
R0070644	MICHIGAN AVE	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 874100100	
R0070812	8 ILLINOIS	JACQUEZ ORLANDO J ET UX	P O BOX 324	BLOOMFIELD, NM 874130324	
R0071023	N 1ST ST	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 874100100	
R0071101	169 IDAHO ST	MILLIKIN JAMES W ET UX	2120 JOY LYNN	BLOOMFIELD, NM 874136705	
R0071160	2211 N 1ST ST	COURY JOHN J JR AND CANDACE	P O BOX 937	AZTEC, NM 87410	C/O TETON ENERGY CONSULTING LLC
R0071186	2200 N 1ST ST	NEW MEXICO STATE HWY COMM	P O BOX 1149	SANTA FE, NM 875041149	
R0071587		HARTMAN EDWARD M TRUSTEE ET AL	1002 TRAMWAY LN NE	ALBUQUERQUE, NM 871221317	
R0071823	2901 N 1ST ST	MANTLE MACK DUANE ET AL	5310 HALLMARC DR	FARMINGTON, NM 87402	
R0071824	3169 N 1ST ST	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 87410	
R0071884	61 ROAD 4945	GURULE MACK R	P O BOX 1024	BLOOMFIELD, NM 874131024	
R0071970	200 MONTANA	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 874100100	
R0071971	2001 N 1ST ST	JACQUES J ORLANDO ET UX	P O BOX 324	BLOOMFIELD, NM 874130324	
R0071973	3150 N 1ST ST	STINSON JOHNNY R AND MACHELLE A	P O BOX 618	AZTEC, NM 87410	
R0071975	3200 N 1ST ST	BLACK HILLS EXPLORATION AND PRODUCTION	350 INDIANA ST STE 400	GOLDEN, CO 80401	INC
R0071976	3100 N 1ST ST	D AND C PROPERTIES LLC	PO BOX 1735	EUNICE, NM 88231	
R0071977	3015 RENO	JONES AMY L	P O BOX 2775	BLOOMFIELD, NM 874132775	C/O LINDSAY DE LAWS AND CHERYL R
R0071978	260 N 1ST ST	D AND C PROPERTIES LLC	PO BOX 1735	EUNICE, NM 88231	
R0071979	2763 NEVADA	MC DANIEL GARY C ET UX	P O BOX 2225	BLOOMFIELD, NM 874132225	
R0071981	6 RENO	BENNY ALVIN ET AL	P O BOX 1044	BLOOMFIELD, NM 874131044	
R0071982	2755 NEVADA	DEE WAYNE LEWIS	P O BOX 41	AZTEC, NM 87410	
R0071983	2759 A NEVADA	WINDHAM DEVELOPMENT LLC	8 APACHE PLUME DR	SANTA FE, NM 87508	C/O HOLMES BARBARA
R0071984	2759 NEVADA	WINDHAM DEVELOPMENT LLC	8 APACHE PLUME DR	SANTA FE, NM 87508	C/O HOLMES BARBARA
R0071985	MICHIGAN AVE	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 87410	
R0072105	2751 NEVADA	LITKE IRVIN L TRUSTEES	P O BOX 518	BLOOMFIELD, NM 874130518	
R0072106	110 OHIO	RANEY KENNETH N AND ROSE A	P O BOX 2122	BLOOMFIELD, NM 874132122	
R0072108	273 N 1ST ST	F&B L L C	PO BOX 187	BLOOMFIELD, NM 87413	
R0072109	273 N 1ST ST	F&B L L C	PO BOX 187	BLOOMFIELD, NM 87413	
R0072110	273 N 1ST ST	F&B L L C	PO BOX 187	BLOOMFIELD, NM 87413	
R0072111	273 N 1ST ST	FOUTZ AND BURSOM CONST CO INC	P O BOX 187	BLOOMFIELD, NM 87413	
R0072112	3169 N 1ST ST	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 87410	
R0072224	2758 NEVADA	WILLIAMS JORETTA W	P O BOX 1902	BLOOMFIELD, NM 87413	C/O BEGAY ARTHUR C JR
R0072226	MICHIGAN AVE	MOORE LARRY G AND B CAROL TRUST	502 E SMITH LN	BLOOMFIELD, NM 87413	
R0072227	IDAHO	PHILLIPS JIM R AND LAURA V TRUST	791 N NEWBY LN	BLOOMFIELD, NM 874136755	
R0072411	3300 N 1ST ST	EAVENSON CHARLES AND JOAN E	P O BOX 507	BLOOMFIELD, NM 874130507	
R0072412	MICHIGAN AVE	MOORE AARON	23 RD 2685	AZTEC, NM 87410	
R0072413	MICHIGAN AVE	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 874100100	
R0072415	MICHIGAN AVE	BASIN DISPOSAL	P O BOX 100	AZTEC, NM 874100100	
R0072416	21 MARYLAND	MARTINEZ LEROY ET AL	P O BOX 685	BLOOMFIELD, NM 874130685	

Attachment B
Public Notification

Name and Address of Real Surface Owners Real Property within 1 mile

Account No	Parcel Address	Owner	Address	City, State, Zip	2nd Name
R0072417	2820 BALTIMORE	BDI LAND LLC	506 W ARRINGTON	FARMINGTON, NM 87401	
R0072418	MARYLAND	HARRISON DANNY	P O BOX 295	BLOOMFIELD, NM 874130295	
R0072476	N 1ST ST	INTERMOUNTAIN CRANE LLC	2730 N NELLIS BLVD	LAS VEGAS, NV 891154507	ATTN BRYN BURKE
R0072627	29 MARYLAND	HENSON RILEY ET UX	P O BOX 1441	BLOOMFIELD, NM 874131441	
R0073001	24126 ILLINOIS AVE	CARTER MICHAEL W	P O BOX 555	BLOOMFIELD, NM 874131283	
R0073005	500 MISSOURI ST	DE HERRERA ROCKY L AND JACQUELINE J	922 W MAIN	BLOOMFIELD, NM 874136180	
R0073007	3303 N 1ST ST	WESTERN REFINING WHOLESALE INC	23733 N SCOTTSDALE RD	SCOTTSCALE, AZ 85255	
R0073026	N 1ST ST	WINDHAM PROPERTIES LLC	P O BOX 5892	FARMINGTON, NM 87499	
R0073088	3 MONTANA	BYARS RAYMOND M ETAL	9321 N 136 E AVE	OWASSO, OK 74055	
R0073114	115 MICHIGAN AVE	DAVIS DONALD L AND JOANN	323 ROAD 4990	BLOOMFIELD, NM 87413	C/O CUMMINS TIMOTHY D AND JANA L
R0073116	100 MONTANA	PETROLITE CORP	P O BOX 92108	AUSTIN, TX 78709	ATTN INDUSTRIAL VALUATION SERVICE
R0073214	2756 NEVADA	CANUTO JANIE	P O BOX 1431	BLOOMFIELD, NM 87413	
R0073232	2010 N 1ST ST	CRANE GORDON N JR AND DIANE ETAL	BOX 190	AZTEC, NM 87410	
R0073233	N 1ST ST	ADAMS DONALD C TRUST ETAL	3807 N SUNSET AVE	FARMINGTON, NM 874019239	
R0073236	3100 N 1ST ST	D AND C PROPERTIES LLC	PO BOX 1735	EUNICE, NM 88231	
R0073237	MONTANA	NATCO PETROLEUM INC	PO BOX 445	BLOOMFIELD, NM 87413	
R0073238	MONTANA	ROTH LAVERNE L	P O BOX 83	FARMINGTON, NM 87499	
R0073276	2250 N 1ST ST	THORNTON DAVID	P O BOX 1963	BLOOMFIELD, NM 874131963	
R0073296	3100 N 1ST ST	D AND C PROPERTIES LLC	PO BOX 1735	EUNICE, NM 88231	
R0073297	3100 N 1ST ST	D AND C PROPERTIES LLC	PO BOX 1735	EUNICE, NM 88231	
R0073314	N 1ST ST	PINKETT TRUST	5340 COLIBRI PL	FARMINGTON, NM 87401	
R0073318	2250 N 1ST ST	THORNTON DAVID	6990 FOOTHILLS DR	FARMINGTON, NM 87402	
R0073333	IDAHO	CHENAULT CONSULTING INC	PO BOX 328	BLOOMFIELD, NM 87413	
R0073334	2200 N 1ST ST	NATIONAL TANK COMPANY	507 S MAIN STE 601	TULSA, OK 741034469	
R0073368	2300 N 1ST ST	GRADY MICHAEL E	1621 W MURRAY	FARMINGTON, NM 87401	
R0073369	TUCSON	MESA WELL SERVICING LP	PO BOX 1620	HOBBS, NM 88241	
R0073408	203 KENTUCKY AVE	MURRAY RODNEY JAY	P O BOX 2342	BLOOMFIELD, NM 874130000	
R0073646	NEVADA	PARTNERS IV LLC	712 FORD ST	AZTEC, NM 874102067	C/O TR TRUCKING INC
R0073655	33 MARYLAND	BDI LAND LLC	P O BOX 1982	FARMINGTON, NM 87499	
R0073656	N 1ST ST	DRAKE TWANA AND LORRAINE	P O BOX 448	FLORA VISTA, NM 87415	
R0073657	500 MARYLAND	CRUZ BEN A AND PAULINE N	33 ROAD 5290	FARMINGTON, NM 87401	
R0073718	2886 N 1ST ST	ESTRADA FRANCISCO J	P O BOX 2124	BLOOMFIELD, NM 87413	
R0073827	ILLINOIS AVE	CARTER MARGARET L	P O BOX 681	BLOOMFIELD, NM 874131283	
R0073919	246 N 1ST ST	AJAC ENTERPRISES	8359 CORONA LOOP NE STE 100	ALBUQUERQUE, NM 871131614	
R0073939	126 MARYLAND	BDI LAND LLC	506 W ARRINGTON	FARMINGTON, NM 87401	
R0073940	130 MARYLAND	MARTINEZ LEROY M ET AL	P O BOX 685	BLOOMFIELD, NM 87413	
R0073941	29 MARYLAND	HENSON RILEY ET UX	P O BOX 1441	BLOOMFIELD, NM 87413	
R4001564	IDAHO	CHENAULT CONSULTING INC	PO BOX 328	BLOOMFIELD, NM 87413	
R4001565	N 1ST ST	NATIONAL TANK COMPANY	507 S MAIN STE 601	TULSA, OK 741034469	
R4001566	ILLINOIS	CARTER MARGARET L	P O BOX 681	BLOOMFIELD, NM 87413	
R4001567	N 1ST ST	NATIONAL TANK COMPANY	507 S MAIN STE 601	TULSA, OK 741034469	
	126 ILLINOIS	CARTER MIKE	P O BOX 555	BLOOMFIELD, NM 87413	
	IDAHO ST	CARTER MARGARET L	734 ROAD 4990	BLOOMFIELD, NM 87413	C/O GATHINGS KENNETH AND MARY
	201 IDAHO ST	BLOOMFIELD CITY OF	P O BOX 1839	BLOOMFIELD, NM 87413	
	IDAHO ST	CARTER MARGARET L	734 ROAD 4990	BLOOMFIELD, NM 87413	C/O GATHINGS KENNETH AND MARY
	201 IDAHO ST	BLOOMFIELD CITY OF	P O BOX 1839	BLOOMFIELD, NM 874131839	
	N 1ST ST	BLOOMFIELD CITY OF	P O BOX 1839	BLOOMFIELD, NM 874131839	
	3501 PROVO	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
	3503 PROVO	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
	3505 PROVO	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
	3507 PROVO	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
	124 UTAH ST	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
	N 1ST ST	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
	MISSOURI ST	BIG BLACK DOG LLC	25528 GENESEE TR RD	GOLDEN, CO 80401	
	100 MISSOURI ST	BIG BLACK DOG LLC	25528 GENESEE TR RD	GOLDEN, CO 80401	
	N 1ST ST	D J SIMMONS CO LTD PARTNERSHIP	1009 RIDGEWAY PL STE 200	FARMINGTON, NM 87401	
	N 1ST ST	CRANE GORDON N AND DORCAS A TRST ETAL	1009 RIDGEWAY PL STE 200	FARMINGTON, NM 87401	C/O D J SIMMONS CO LTD PARTNERSHIP

Attachment B
Public Notification

Name and Address of Real Surface Owners Real Property within 1 mile

Account No	Parcel Address	Owner	Address	City, State, Zip	2nd Name
	101 MISSOURI ST	PASCETTI INVESTMENTS LLC	34940 HWY 550 NORTH	DURANGO, CO 81301	
	139 MISSOURI ST	PASCETTI INVESTMENTS LLC	34940 HWY 550 NORTH	DURANGO, CO 81301	
	MISSOURI ST	PASCETTI INVESTMENTS LLC	34940 HWY 550 NORTH	DURANGO, CO 81301	
	201 MISSOURI ST	HAULRITE OF FOUR CORNERS INC	24 ROAD 2929	AZTEC, NM 87410	
	W MISSOURI ST	DE HERRERA ROCKY L AND JACQUELINE	922 W MAIN	BLOOMFIELD, NM 87413	
	100 IOWA	TWIN STARS LTD	P O BOX 1469	FARMINGTON, NM 87499	
	IDAHO ST	PHILLIPS JIM R AND LAURA V TRUST	828 ROAD 4990	BLOOMFIELD, NM 87413	C/O GATHINGS KENNETH AND MARY
	250 N 1ST ST	YOAKUM ROBERT L	614 SMITH	BLOOMFIELD, NM 87413	
	102 MONTANA	TURNBAUGH MICHAEL J AND KIM L	9321 N 136 E AVE	OWASSO, OK 74055	
	134 KENTUCKY AVE	SFT LLC	P O BOX 25865	ALBUQUERQUE, NM 87125	
	KENTUCKY AVE	SFT LLC	P O BOX 25865	ALBUQUERQUE, NM 87125	
	N 1ST ST	BLOOMFIELD ECONOMIC DEVELOPMENT LLC	7615 INDIAN SCHOOL ROAD NE	ALBUQUERQUE, NM 87110	ATTN RIO REAL ESTATE INVESTMENT
	N 1ST ST	TURNBAUGH MICHAEL J AND KIM L	9321 N 136 E AVE	OWASSO, OK 74055	
	MARYLAND	HENSON RILEY AND PAULINE	P O BOX 1441	BLOOMFIELD, NM 87413	
	199 KENTUCKY AVE	COURY JOHN J ET UX	6651 US 64	BLOOMFIELD, NM 87413	
	KENTUCKY AVE	COURY JOHN J JR AND CANDACE M	6651 US 64	BLOOMFIELD, NM 87413	
	200 KENTUCKY AVE	QUINTANA JAIME ET AL	PO BOX 1173	BLOOMFIELD, NM 874131173	
	300 IOWA	COURY JOHN J JR AND CANDACE M	6651 US 64	BLOOMFIELD, NM 87413	
	180 IOWA	COURY CANDACE M	6651 US 64	BLOOMFIELD, NM 87413	
	306 IOWA	COURY JOHN J JR AND CANDACE M	PO BOX 2521	BLOOMFIELD, NM 87413	C/O MANGUM PHYLLIS
	182 IOWA	COURY JOHN J AND CANDACE	6651 US 64	BLOOMFIELD, NM 87413	
	N 1ST ST	PHILLIPS JIM R AND LAURA V TRUST	791 NEWBY LN	BLOOMFIELD, NM 87413	
	N 1ST ST	PHILLIPS JIM R AND LAURA V TRUST	791 NEWBY LN	BLOOMFIELD, NM 87413	

Draft Public Notice

DRAFT

Notice of Major Modification- Basin Disposal, Inc. (BDI)

Pursuant to 19.15.36 NMAC, Oil Conservation Division Surface Waste Management Facilities regulations; Basin Disposal, Inc. (BDI) is providing notice that the Oil Conservation Division has deemed administratively complete an Application for Modification initially submitted by BDI on November 3, 2008.

(1) Applicant's name and address: Jerry Sandel, President Basin Disposal, Inc. P.O. Box 100, Aztec, NM 87410. Contact Mr. John Volkerding, General Manager Telephone: (505) 632-8936

(2) Facility location and address: 200 Montana Street, Bloomfield, NM 87413. Location of facility is approximately 3 miles north of the intersection of State Roads 550 and 64.

(3) Brief description of proposed surface waste management facility: The major modification includes the addition of two (2) evaporation ponds (approximately 4 acres each) constructed with 60-mil high density polyethylene (HDPE) primary liner, leak detection, and secondary liner systems. In addition, six (6) additional oil field waste liquid receiving tanks and two (2) oil sales tanks will be installed at the facility.

(4) Depth and quality of shallowest aquifer: The depth to the perched water zone beneath the site ranges from 29.25 feet in assessment well (AW) AW-1 to 42 feet in AW-2 with the total dissolved solids (TDS) determined to be 38,000 mg/l and 24,000 mg/l, respectively. Fresh water beneath the site is projected at a depth of at least 105' below the lowest elevation on-site.

Interested parties may contact Mr. Edward J. Hansen, OCD Hydrologist at (505) 476-3489 or Mr. John Volkerding, BDI General Manager at (505) 632-8936 for further information.

List of Property Owners within ½ mile

Attachment B
Public Notification

List of Property Owners within 1/2 mile

Parcel Address	Owner	Address	City, State, Zip	2nd Name
15731 US 550	CRANE LEE M TRUSTEE	125 S POLLARD	AZTEC, NM 874102073	
203 UTAH ST	YOCUM DONALD P SR AND SUE TRUST	PO BOX 188	BLOOMFIELD, NM 87413	
UTAH ST	HOLLAR SAMUEL C ET UX	P O BOX 2016	BLOOMFIELD, NM 874132016	
3650 N 1ST ST	HOLLAR SAMUEL C ET UX	P O BOX 2016	BLOOMFIELD, NM 874132016	
200 UTAH ST	MC CONNEL WILLIAM E AND JERILYN R TRUST	P O BOX 941	AZTEC, NM 874100941	
3601 F N 1ST ST	PASCETTI INVESTMENTS LLC	34940 HWY 550 NORTH	DURANGO, CO 81301	
MONTANA	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 874100100	
N 1ST ST	ADAMS DONALD C TRUST ETAL	P O BOX 190	AZTEC, NM 87410	C/O CRANE GORDON N JR AND DIANE ETAL
100 MARYLAND	DRAKE TWANA AND LORRAINE	P O BOX 448	FLORA VISTA, NM 87415	
MICHIGAN AVE	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 874100100	
N 1ST ST	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 874100100	
2901 N 1ST ST	MANTLE MACK DUANE ET AL	5310 HALLMARC DR	FARMINGTON, NM 87402	
3169 N 1ST ST	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 87410	
61 ROAD 4945	GURULE MACK R	P O BOX 1024	BLOOMFIELD, NM 874131024	
200 MONTANA	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 874100100	
3150 N 1ST ST	STINSON JOHNNY R AND MACHELLE A	P O BOX 618	AZTEC, NM 87410	
3200 N 1ST ST	BLACK HILLS EXPLORATION AND PRODUCTION	350 INDIANA ST STE 400	GOLDEN, CO 80401	INC
3100 N 1ST ST	D AND C PROPERTIES LLC	PO BOX 1735	EUNICE, NM 88231	
3015 RENO	JONES AMY L	P O BOX 2775	BLOOMFIELD, NM 874132775	C/O LINDSAY DE LAWS AND CHERYL R
260 N 1ST ST	D AND C PROPERTIES LLC	PO BOX 1735	EUNICE, NM 88231	
2763 NEVADA	MC DANIEL GARY C ET UX	P O BOX 2225	BLOOMFIELD, NM 874132225	
6 RENO	BENNY ALVIN ET AL	P O BOX 1044	BLOOMFIELD, NM 874131044	
2755 NEVADA	DEE WAYNE LEWIS	P O BOX 41	AZTEC, NM 87410	
2759 A NEVADA	WINDHAM DEVELOPMENT LLC	8 APACHE PLUME DR	SANTA FE, NM 87508	C/O HOLMES BARBARA
2759 NEVADA	WINDHAM DEVELOPMENT LLC	8 APACHE PLUME DR	SANTA FE, NM 87508	C/O HOLMES BARBARA
MICHIGAN AVE	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 87410	
2751 NEVADA	LITKE IRVIN L TRUSTEES	P O BOX 518	BLOOMFIELD, NM 874130518	
110 OHIO	RANEY KENNETH N AND ROSE A	P O BOX 2122	BLOOMFIELD, NM 874132122	
273 N 1ST ST	F&B L L C	PO BOX 187	BLOOMFIELD, NM 87413	
273 N 1ST ST	F&B L L C	PO BOX 187	BLOOMFIELD, NM 87413	
273 N 1ST ST	F&B L L C	PO BOX 187	BLOOMFIELD, NM 87413	
273 N 1ST ST	FOUTZ AND BURSOM CONST CO INC	P O BOX 187	BLOOMFIELD, NM 87413	
3169 N 1ST ST	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 87410	
2758 NEVADA	WILLIAMS JORETTA W	P O BOX 1902	BLOOMFIELD, NM 87413	C/O BEGAY ARTHUR C JR
MICHIGAN AVE	MOORE LARRY G AND B CAROL TRUST	502 E SMITH LN	BLOOMFIELD, NM 87413	
3300 N 1ST ST	EAVENSON CHARLES AND JOAN E	P O BOX 507	BLOOMFIELD, NM 874130507	
MICHIGAN AVE	MOORE AARON	23 RD 2685	AZTEC, NM 87410	
MICHIGAN AVE	BASIN DISPOSAL INC	P O BOX 100	AZTEC, NM 874100100	
MICHIGAN AVE	BASIN DISPOSAL	P O BOX 100	AZTEC, NM 874100100	
21 MARYLAND	MARTINEZ LEROY ET AL	P O BOX 685	BLOOMFIELD, NM 874130685	
2820 BALTIMORE	BDI LAND LLC	506 W ARRINGTON	FARMINGTON, NM 87401	
MARYLAND	HARRISON DANNY	P O BOX 295	BLOOMFIELD, NM 874130295	
N 1ST ST	INTERMOUNTAIN CRANE LLC	2730 N NELLIS BLVD	LAS VEGAS, NV 891154507	ATTN BRYN BURKE
29 MARYLAND	HENSON RILEY ET UX	P O BOX 1441	BLOOMFIELD, NM 874131441	
500 MISSOURI ST	DE HERRERA ROCKY L AND JACQUELINE J	922 W MAIN	BLOOMFIELD, NM 874136180	
3303 N 1ST ST	WESTERN REFINING WHOLESALE INC	23733 N SCOTTSDALE RD	SCOTTSCALE, AZ 85255	
N 1ST ST	WINDHAM PROPERTIES LLC	P O BOX 5892	FARMINGTON, NM 87499	
3 MONTANA	BYARS RAYMOND M ETAL	9321 N 136 E AVE	OWASSO, OK 74055	
115 MICHIGAN AVE	DAVIS DONALD L AND JOANN	323 ROAD 4990	BLOOMFIELD, NM 87413	C/O CUMMINS TIMOTHY D AND JANA L
100 MONTANA	PETROLITE CORP	P O BOX 92108	AUSTIN, TX 78709	ATTN INDUSTRIAL VALUATION SERVICE
2756 NEVADA	CANUTO JANIE	P O BOX 1431	BLOOMFIELD, NM 87413	
3100 N 1ST ST	D AND C PROPERTIES LLC	PO BOX 1735	EUNICE, NM 88231	
MONTANA	NATCO PETROLEUM INC	PO BOX 445	BLOOMFIELD, NM 87413	
MONTANA	ROTH LAVERNE L	P O BOX 83	FARMINGTON, NM 87499	
3100 N 1ST ST	D AND C PROPERTIES LLC	PO BOX 1735	EUNICE, NM 88231	
3100 N 1ST ST	D AND C PROPERTIES LLC	PO BOX 1735	EUNICE, NM 88231	
NEVADA	PARTNERS IV LLC	712 FORD ST	AZTEC, NM 874102067	C/O TR TRUCKING INC

Attachment B
Public Notification

List of Property Owners within 1/2 mile

Parcel Address	Owner	Address	City, State, Zip	2nd Name
33 MARYLAND	BDI LAND LLC	P O BOX 1982	FARMINGTON, NM 87499	
N 1ST ST	DRAKE TWANA AND LORRAINE	P O BOX 448	FLORA VISTA, NM 87415	
500 MARYLAND	CRUZ BEN A AND PAULINE N	33 ROAD 5290	FARMINGTON, NM 87401	
2886 N 1ST ST	ESTRADA FRANCISCO J	P O BOX 2124	BLOOMFIELD, NM 87413	
246 N 1ST ST	AJAC ENTERPRISES	8359 CORONA LOOP NE STE 100	ALBUQUERQUE, NM 871131614	
126 MARYLAND	BDI LAND LLC	506 W ARRINGTON	FARMINGTON, NM 87401	
130 MARYLAND	MARTINEZ LEROY M ET AL	P O BOX 685	BLOOMFIELD, NM 87413	
29 MARYLAND	HENSON RILEY ET UX	P O BOX 1441	BLOOMFIELD, NM 87413	
3501 PROVO	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
3503 PROVO	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
3505 PROVO	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
3507 PROVO	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
124 UTAH ST	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
N 1ST ST	SCHAFFER FAMILY TRUST	P O BOX 23	AZTEC, NM 87410	
MISSOURI ST	BIG BLACK DOG LLC	25528 GENESEE TR RD	GOLDEN, CO 80401	
100 MISSOURI ST	BIG BLACK DOG LLC	25528 GENESEE TR RD	GOLDEN, CO 80401	
101 MISSOURI ST	PASCETTI INVESTMENTS LLC	34940 HWY 550 NORTH	DURANGO, CO 81301	
139 MISSOURI ST	PASCETTI INVESTMENTS LLC	34940 HWY 550 NORTH	DURANGO, CO 81301	
MISSOURI ST	PASCETTI INVESTMENTS LLC	34940 HWY 550 NORTH	DURANGO, CO 81301	
201 MISSOURI ST	HAULRITE OF FOUR CORNERS INC	24 ROAD 2929	AZTEC, NM 87410	
W MISSOURI ST	DE HERRERA ROCKY L AND JACQUELINE	922 W MAIN	BLOOMFIELD, NM 87413	
250 N 1ST ST	YOAKUM ROBERT L	614 SMITH	BLOOMFIELD, NM 87413	
102 MONTANA	TURNBAUGH MICHAEL J AND KIM L	9321 N 136 E AVE	OWASSO, OK 74055	
N 1ST ST	BLOOMFIELD ECONOMIC DEVELOPMENT LLC	7615 INDIAN SCHOOL ROAD NE	ALBUQUERQUE, NM 87110	ATTN RIO REAL ESTATE INVESTMENT
N 1ST ST	TURNBAUGH MICHAEL J AND KIM L	9321 N 136 E AVE	OWASSO, OK 74055	
MARYLAND	HENSON RILEY AND PAULINE	P O BOX 1441	BLOOMFIELD, NM 87413	

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME I: PERMIT APPLICATION TEXT
PART 36: SURFACE WASTE MANAGEMENT FACILITIES

ATTACHMENT C

FINANCIAL ASSURANCE

Financial Assurance Documentation

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

August 9, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-560

Mr. Jerry Sandel
Basin Disposal, Inc.
P.O. Box 100
Aztec, NM 87401

RE: $140,000 Financial Assurance for
Commercial Surface Waste Management Facility Permit NM-01-0005
Basin Disposal, Inc., Principal
Citizens Bank of Farmington, Surety
Letter of Credit No. 2216

Dear Mr. Sandel:

The New Mexico Oil Conservation Division hereby approves the above-referenced Commercial Waste Management Facility Letter of Credit.

Sincerely,

Rand Carroll,
Legal Counsel

RC:mjk

Enclosure: Copy of Letter of Credit No. 2216

xc with attachment: Aztec OCD Office

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division

Irrevocable Letter of Credit For Waste Management Facilities
(File with Oil Conservation Division, 2040 South Pacheco Street, Santa Fe, New Mexico 87505)

LETTER OF CREDIT NO. 2216

Citizens Bank of Farmington [Name of Issuing Bank] (Issuing Bank), a corporation organized and existing under the laws of the State of New Mexico, and authorized to do business in the State of New Mexico with a duly appointed resident agent in the State of New Mexico, hereby establishes this Irrevocable Letter of Credit for the use and benefit of the Oil Conservation Division of the Energy, Minerals and Natural Resources Department (the "Division") pursuant to Section 70-2-12 NMSA 1978, as amended for an aggregate amount not to exceed $ 140,000.00 ($40,000.00) [closure cost estimate] in United States dollars ("Face Amount") effective immediately. This Letter of Credit is established for Basin Disposal, Inc., (an individual, partnership, or a corporation organized in the State of New Mexico, with its principal office in the City of Farmington, State of New Mexico, and authorized to do business in the State of New Mexico), as PRINCIPAL.

The conditions of this obligation are such that:

1. The Principal has or may enter into the collection, disposal, evaporation, remediation, reclamation, treatment or storage of produced water, drilling fluids, drill cuttings, completion fluids, contaminated soils, BS&W, tank bottoms, waste oil and/or other oil field related waste in Section 3, Township 29N, Range 11W, NMPM, San Juan County, New Mexico (the Facility).

2. This Letter of Credit is irrevocable for a term of not less than five (5) years and is conditioned upon substantial compliance by the Principal with all applicable statutes of the State of New Mexico and all rules and orders of the Oil Conservation Commission and Division, and upon clean-up of the facility site by the Principal to the standards set by the Division.

3. This Letter of Credit will expire on (a) 7/15/04 [not less than five (5) years from the effective date of the Letter of Credit] or (b) the date upon which sufficient documents are executed by the Division to release the principal from further liability for closure of the Facility with notice to the Issuing Bank by the Division accompanied by the original Letter of Credit with directions for cancellation. This Letter of Credit shall be forfeited and collected by the State of New Mexico if not replaced by other suitable financial assurance or Letter if Credit at least 90 days before the expiration date.

4. This Letter of Credit will remain effective until the (a) expiration date or (b) the operator (principal) replaces this Letter of Credit with another acceptable form of financial assurance or (c) the Division releases the Letter of Credit pursuant to Paragraph 3 above, whichever is earlier.

5. Funds under this Letter of Credit are available against the Division's sight draft, in the form of Exhibit A, specifying Letter of Credit No. _____ delivered to the office of the Issuing Bank at _____ Citizens Bank of Farmington [address]. At the Division's sole election, the Division may present sight drafts for less than the Face Amount of this Letter of Credit so long as the aggregate amount of all sight drafts does not exceed the Face Amount. Each draft must be accompanied by a certificate in the form of Exhibit B, purportedly signed by a duly authorized representative of the Division.

6. If the Issuing Bank receives the Division's sight draft(s) and certificate(s) as provided in Paragraph 5. above on or before the expiration or termination of this Letter of Credit, the Issuing Bank will pay such amount as the Division may specify, up to an aggregate amount not to exceed the Face Amount of this Letter of Credit available to the Division, no later than the close of business, Santa Fe time, on the second business day following the Issuing Bank's receipt of the sight draft and certificate and in such a manner as the Division may specify.

7. The Issuing Bank will give prompt notice to the Principal and to the Division Director of any notice received or action filed alleging the insolvency or bankruptcy of the Issuing Bank, or alleging any violations of regulatory requirements which are reasonably likely to result in suspension or revocation of the Issuing Bank's charter or license to do business.

8. This Letter of Credit will be governed by the laws of the State of New Mexico and shall be subject to the Uniform Customs and Practice for Documentary Credit, 1983 revision, International Chamber of Commerce Publication No. 500, as the same may be amended and in effect from time to time ("UCP").

9. All communications regarding this Letter of Credit will be addressed to the Issuing Bank at Citizens Bank of Farmington [address], referencing Letter of Credit No. 2216.

Very truly yours,

_____
Surety

By: Karl Garling
(Name typed or printed)

_____
(Authorized Signature)

Title: Senior Vice President

STATE OF NEW MEXICO
)SS.
COUNTY OF San Juan

On this 13TH day of JULY, 19 99, before me personally appeared _____ and KARL GARLING, SVP, to me known to be the person (persons) described in and who executed the foregoing instrument and acknowledged that they executed the same as their free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and seal on the day and year in this certificate first above written.

My commission expires:
10/29/00
Date

Notary Public

APPROVED BY:
NEW MEXICO OIL CONSERVATION DIVISION

By: _____

Date: 8/9/99

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary
Reese Fullerton
Deputy Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

August 26, 2008

Basin Disposal, Inc.
P.O. Box 100
Aztec, NM 87410

Re: $5,000 One-Well Plugging Bond
Basin Disposal, Inc., Principal
United States Fidelity & Guaranty Company, Surety
API 30-045-26862
Disposal No. 1
2207' FNL and 1870' FWL
Section 3, Township 29 North, Range 11 West
San Juan County, New Mexico
Bond No. 01-0130-10019-88-1

Dear Sir:

We are in receipt of Rider to the above-captioned bond, however, the rider shows Travelers Casualty and Surety Company of America and our records show United States Fidelity and Guaranty Company as surety. They also reference Bond No. 400KJ7084 as the bond number and our records show 10-0130-10019-88-1.

The OCD Attorney will not approve the rider which increases the penal sum to $8,836 until we have something in writing showing that United States Fidelity and Guaranty Company is now Travelers and that the number we show is replaced by the new number.

If you would like to speak to our attorney, his name is David Brooks and he can be reached at (505) 476-3450. I had contacted Travelers both by phone and by letter on August 4, 2008 but have not received a reply.

Sincerely,

Dorothy Phillips
Bond Administrator

RIDER

Travelers Casualty and Surety Company of America
One Tower Square 3PB, Hartford, CT 06183

To be attached to and form a part of:

Bond No. 400KJ7084

Type of Bond: One Well Plugging Bond

Executed by Basin Disposal, Inc., as Principal, and by Travelers Casualty and Surety Company of America, as Surety, in favor of Oil Conservation Commission and dated 1/10/08 .

In consideration of the premium charged for the attached bond, it is hereby agreed to change:
Increase Bond Limit to $8,836.00

From:
$5,000.00

To:
$8,836.00

This rider is effective 1/1/08

This rider is executed upon the express condition that the surety's liability under said bond shall not be cumulative and shall in no event exceed the amount specifically set forth in said bond or any existing certificate changing the amount of said bond. The referenced bond shall be subject to all its agreements, limitations and conditions except as herein expressly modified.

SIGNED, SEALED AND DATED this 10th day of January, 2008.

By: _____
David Turner
Principal

Travelers Casualty and Surety Company of America

By: _____
Elizabeth Sevesind Attorney-in-Fact

*RIDER ACCEPTED BY:

_____
(Obligee)

_____
Date
*If Obligee signature required, please sign duplicate and return to Surety.

S-1234 (01-99)

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary
Reese Fullerton
Deputy Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

December 29, 2008

Basin Disposal, Inc.
P.O. Box 100
Aztec, NM 87410

Re: $5,000 One-Well Plugging Bond
Basin Disposal, Inc., Principal
United States Fidelity & Guaranty Company, Surety
API 30-045-26862
Disposal No. 1
2207' FNL and 1870' FWL
Section 3, Township 29 North, Range 11 West
San Juan County, New Mexico
Bond No. 01-0130-10019-88-1

Dear Sir:

The New Mexico Oil Conservation Division hereby acknowledges receipt of and approves Rider dated January 1, 2008 increasing the bond amount to **$8,836** and acknowledges receipt of and approves Rider dated September 17, 2008 changing the bond number to **400KJ7084.** We also acknowledge receipt of Letter of Explanation from Woods Insurance Service advising that U. S. Fidelity and Guaranty Company was purchased by St. Paul Travelers who was later purchased by Travelers Casualty and Surety Company of America who now holds bond No. 400KJ7084.

Sincerely,

David K. Brooks

DAVID K. BROOKS
Assistant General Counsel

DKB/dp

cc: Oil Conservation Division – Aztec, NM

Travelers Casualty and Surety Company of America
One Tower Square 3PB
Hartford, CT 06183

Revised C/PC Cost Estimate

Attachment C
Basin Disposal, Inc.
Oil Waste Evaporation Basins

Table 1
C/PC Cost Estimates Summary
(September 2008)

Activity	C/PC
1. Site Closure Cost Summary (30 acres maximum open area)	$ 267,299
2. Post-closure Care and Monitoring	$ 19,800
Total:	**$ 287,099**

Table 2
Closure Cost Estimate
(September 2008)

Task Description	Units	Unit Cost	Total (28 acres)	
			Quantity	Cost
1.0 Evaporation Pond				
1.1 Liquids Transport/Disposal				
1.1.1 Transport Liquid	bbl	$1.75	70	$ 123
1.1.2 Disposal Liquids	bbl	$0.95	70	$ 67
1.1.3 Remove/Transport Sludge	ton	$6.50	4,840	$ 31,460
1.1.4 Disposal Sludge	ton	$15.00	4,840	$ 72,600
1.1.5 Liner Removal/Transport	yd^3	$4.00	200	$ 800
1.1.6 Disposal Liner	yd^3	$4.25	200	$ 850
1.2 Pond Backfill and Contouring				
1.2.1 Purchase Soil	yd^3	$1.00	0	$ -
1.2.2 Place and Compact Soil	yd^3	$1.90	15,000	$ 28,500
1.3 Seeding	acres	$1,200	28	$ 33,600
Pond Closure Subtotal:			$	167,999
2.0 Site Work				
2.1 Tank Removal	Lump Sum		$	25,000
2.2 General Contouring	Lump Sum		$	10,000
Site Work Subtotal:			$	35,000
3.0 Engineering				
3.1 CQA/Certification	Lump Sum		$	40,000
Engineering Subtotal:	Lump Sum		$	40,000
4.0 Totals				
4.1 Subtotal			$	242,999
4.2 Adminstration Cost (10%)			$	24,300
Total:			**$**	**267,299**

NOTES:

1. Closure costs are based on contracting with a qualified third party to complete and certify closure.
2. Assume 1000 gallons of residual water in each pond.
3. Assume 6" of sludge remaining in each pond at closure.
4. Site Sampling is conducted during the CQA phase.
5. $25,000 well plugging bond on file with OCD.

Attachment C
Basin Disposal, Inc.
Oil Waste Evaporation Basins

Table 3
Post-closure Care and Monitoring Cost Estimate
(September 2008)

Description	Events /Year	Labor Hours	Cost	Materials Cost	Cost/yr	Total Cost /3yrs
Engineering Tasks[1]						
1. Site Inspection						
Field Services/Reporting (3 years)						
Monitoring Events	4	4	$ 75.00 hr	$ -	$ 1,200.00	$ 3,600.00
2. Recordkeeping and Reporting						
Reports	1	15	$ 75.00 hr	$ -	$ 1,125.00	$ 3,375.00
				Engineering Subtotal:	**$ 2,325.00**	**$ 6,975.00**
Maintenance Tasks						
1. Final Cover					$ -	$ -
Cover Maintenance/Vegetation					$ -	$ -
Repairs	2	1	$1,500.00 ls	$ -	$ 3,000.00	$ 9,000.00
2. Surface Water Management System					$ -	$ -
Repairs	1	8	$ 75.00 hr	$ 75.00 hr	$ 675.00	$ 2,025.00
				Maintenance Subtotal:	**$ 3,675.00**	**$ 11,025.00**
				Total:	**$ 6,000.00**	**$ 18,000.00**
				Contingency *(10% of Total Cost):*	$ 600.00	$ 1,800.00
				Grand Total:	**$ 6,600.00**	**$ 19,800.00**

NOTES:

1. Post-closure care and monitoring costs are based on contracting with a qualified third party to conduct post-closure care.
2. The activities included in this cost estimate are based on previous experience with oil waste disposal facilities located in arid climates.
3. Costs are in current dollars.
4. Estimate assumes facility is not in post closure remediation.
5. ls = lump sum

STATE OF NEW MEXICO
DIRECTOR OF OIL CONSERVATION DIVISION

IN THE MATTER OF THE APPLICATION OF BASIN DISPOSAL, INC. FOR A SURFACE WASTE MANAGEMENT FACILITY PERMIT

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OCD Permit # NM-01-0005

DECEMBER 2008
(Updated June 2009)

VOLUME II:
FACILITY MANAGEMENT PLANS

Prepared For:

Basin Disposal, Inc.
200 Montana Street
Bloomfield, NM 87413
(505) 632-8936

Submitted To:

New Mexico Energy, Minerals, and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505
(505) 476-3440

Prepared By:

Gordon Environmental, Inc.
213 South Camino del Pueblo
Bernalillo, NM 87004
(505) 867-6990

RECEIVED
AUG 27 2009
Environmental Bureau
Oil Conservation Division

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN
(INCORPORATING A BEST MANAGEMENT PRACTICES PLAN)

TABLE OF CONTENTS

LIST OF FIGURES

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LIST OF ATTACHMENTS

SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

1.0 FACILITY DESCRIPTION

Basin Disposal, Inc. (BDI) is an existing surface waste management facility permitted under OCD regulations. The Facility receives liquid waste from oil and gas operations in the Four Corners area in northwest New Mexico. The Facility is organized in a pattern that allows for specific liquid waste acceptance, treatment, evaporation, or injection of clean liquid (**Section 6.0**). This Application for Modification will increase the evaporation pond portion of the Facility from one to three. Additionally, two Oil Sales Tanks and six Receiving Tanks will be added as part of the Permit Application.

2.0 PURPOSE

The objectives of this Operations, Inspection, & Management Plan (the Plan) are to provide guidance to the BDI staff in the safe and proper procedures for daily operations. This Plan and the accompanying Application for Modification also demonstrate compliance with the applicable requirements of the Surface Waste Management Facilities (SWMF) Regulations; specifically §19.15.36 NMAC; as listed on **Table II.1.1**.

TABLE II.1.1
OCD Requirements: §19.15.36

8.C.(4) *a description of the surface waste management facility with a diagram indicating the location of fences and cattle guards, and detailed construction/installation diagrams of pits, liners, dikes, piping, sprayers, tanks, roads, fences, gates, berms, pipelines crossing the surface waste management facility, buildings and chemical storage areas;*

8.C.(7) *an inspection and maintenance plan that complies with the requirements contained in Subsection L of 19.15.36.13 NMAC;*

8.C.(14) *a best management practice plan to ensure protection of fresh water, public health, safety and the environment;*

13.L. *Each operator shall have an inspection and maintenance plan that includes the following:*

- ***(1)*** *monthly inspection of leak detection sumps including sampling if fluids are present with analyses of fluid samples furnished to the division; and maintenance of records of inspection dates, the inspector and the leak detection system's status;*
- ***(3)*** *inspections of the berms and the outside walls of pond levees quarterly and after a major rainfall or windstorm, and maintenance of berms in such a manner as to prevent erosion.*

3.0 GENERAL FACILITY INFORMATION

3.1 Land Use and Zoning

The BDI facility is located on a 28 ± acre tract in unincorporated San Juan County adjacent to the City of Bloomfield city limits (**Figure IV.1.8; Volume IV, Section 1**). The BDI site is surrounded by commercial/industrial businesses on three sides, and buffered by a bluff on the west side of the Facility. The closest permanent public residence is located approximately 1050 feet directly south. San Juan County does not have zoning on land use.

3.2 Access Control

Access control for BDI is provided by perimeter fencing that surrounds most of the 28 acre footprint, locking gates, and 24-hour employee presence. As part of BDI's standard operating practice, the perimeter fencing and gates will be checked for integrity (**Attachment II.1.D**). The Site Location Map is plotted on the most recent USGS map (**Figure II.1.1)** and shows the Facility location in relation to state roads and Bloomfield. The Site Plan, provided as **Figure II.1.2,** provides a plan view of the BDI facility with superimposed topography.

3.3 Site Signs

Signs are posted at the facility entrance and which indicate the location of the site, hours of operation, emergency telephone numbers, and delivery instructions. Additional existing site rules that are applicable to both BDI and customers are posted along the access roads to advise drivers of limitations concerning speed limits, prohibited activities, acceptable waste types, delivery instructions, and other health and safety precautions (**Figure 2; Volume I, 19.15.36**).

3.5 Traffic

Traffic for the BDI will have a nominal impact on current transportation patterns, estimated at 90 to 200 vehicles per day including staff. On-site Traffic flow for the BDI facility is depicted on **Figure II.1.3**.

SITE LOCATION MAP

SURFACE WASTE MANAGEMENT FACILITY
BASIN DISPOSAL, INC.
SAN JUAN COUNTY, NEW MEXICO

Based on:
FLORA VISTA, NM (1963, PHOTOREVISED 1979),
HORN CANYON, NM (1965 PHOTOREVISED 1979),
AZTEC, NM (1985 PROVISIONAL EDITION), AND
BLOOMFIELD (1985 PROVISIONAL EDITION),
USGS 7.5' SERIES (1:24,000 SCALE TOPOGRAPHIC) QUADRANGLES.

Drawing:P:\acad 2003\520.01.01\02\FIGURES\SITE LOCATION 24K.dwg
Date/Time:Oct. 27, 2008-09:16:27

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 10/27/08	CAD: SITE LOCATION 24K.dwg	PROJECT #: 520.01.01
DRAWN BY: MLH	REVIEWED BY: IKG	FIGURE II.1.1
APPROVED BY: IKG	gei@gordonenvironmental.com	

BOREHOLE LOCATIONS	
BH-2	LAT 36°45'20.54269"N (NAD 83) LONG 107°59'02.70950"W (NAD83) ELEV: 5717.98 (GROUND)
BH-3	LAT 36°45'22.92950"N (NAD 83) LONG 107°59'04.21563"W (NAD83) ELEV: 5727.46 (GROUND)
AW-1	LAT 36°45'22.01797"N (NAD 83) LONG 107°58'55.15402"W (NAD83) ELEV: 5717.85 (TOP OF CAP)
AW-2	LAT 36°45'20.58589"N (NAD 83) LONG 107°59'02.96163"W (NAD83) ELEV: 5722.20 (TOP OF CAP)

LEGEND

- PROPERTY BOUNDARY
- 2' CONTOUR (EXISTING)
- 5700 — 10 CONTOUR (EXISTING)
- 2' DEPRESSION CONTOUR (EXISTING)
- 5700 — 10' DEPRESSION CONTOUR (EXISTING)
- ROADWAY (EXISTING)
- FENCE (EXISTING)
- PROPOSED NEW TANKS
- CULVERT
- STRUCTURE
- CONCRETE SLAB
- AW-1 ASSESSMENT WELL
- BH-3 BOREHOLE LOCATION
- TANKS
- LIGHT POLE (EXISTING)
- POWER POLE (EXISTING)
- 5705.6 × SPOT ELEVATIONS

NORTH

0 100' 200'

SITE PLAN

BASIN DISPOSAL, INC.
BLOOMFIELD, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 06/05/09	CAD: SITE PLAN.dwg	PROJECT #: 520.01.01
DRAWN BY: JFP	REVIEWED BY: MRH	FIGURE II.1.2
APPROVED BY: IKG	gei@gordonenvironmental.com	

4.0 BDI FACILITY PERSONNEL

4.1 Requirements and Duties

Daily operations at BDI will be supervised by the BDI management team that is located in the adjacent Office Administration Center. Acceptance of the source liquid waste as described in the Oil Field Waste Acceptance Criteria Plan, along with screening, ensure that only acceptable materials are transported to BDI. The initial staffing for BDI is projected as follows (**Table II.1.2**), subject to augmentation in response to materials receipts:

TABLE II.1.2
BDI Staffing List

Description	Number
General Manager	1
Plant Supervisors	1-2
Equipment Operators	5-6
Laborer	3-5

Administrative support is provided by both BDI management and personnel. BDI training for all personnel includes health and safety protection, waste screening, fire preventing, emergency response, etc. Mr. John Volkerding, Ph.D., is the Emergency Coordinator for BDI as identified in the BDI H_2S Contingency Plan (**Volume II, Section 3**) and the Facility Contingency Plan (**Volume II, Section 5**).

4.2 Training Requirements

A trained operator or representative with full knowledge of OCD regulations and the permit requirements will be present at all times while the facility is being operated. BDI staff will be required to read this Operation, Inspection and Management Plan and the BDI Contingency Plans. Signature sheets acknowledging that this requirement has been met will be retained in the BDI Facility Operating Record in accordance with the Safety Communications Program (**Attachment II.1.A**).

5.0 OPERATIONAL PROCEDURES

The operational procedures for the BDI are designed to maximize the efficiency of waste receiving and processing; and to protect the health and safety of facility staff and delivery personnel. Detailed operational procedures are enumerated in each of the applicable sections of this Plan for oil field waste stream processing, contingency planning, recordkeeping, personnel training, etc. Oil field waste disposal waste operations will be conducted in a safe and environmentally sound manner is accordance with 19.15.36.17 NMAC.

5.1 Noise Control

Disposal operations take place in an area surrounded by businesses in the oil and gas industry which are familiar with the processes at the facility. The closest permanent residences are 1270 feet to the northeast, 1046 feet to the south and 1306 feet to the southeast, which minimize potential noise impacts generated by processing activities. In addition, mechanical equipment, such as the pumps and injection well, are located in fully enclosed buildings.

5.2 Odor Control

Prior to oil field waste acceptance, all vehicles are screened for the presence of H_2S. If H_2S is detected, the load is treated with CaOCl to lower the H_2S to non-measureable levels prior to unloading operations. In addition, at least 1,000 gallons of chemicals such as bleach are maintained on-site to control H_2S and its potential associated odors originating from the evaporation ponds.

5.3 Dust Control

The access roads and active areas within the facility will be treated with water or approved recycled waters as needed with a water truck to reduce dust. In addition, the posted speed is 15 mph inside the property. Listed below are routine operations that are the most likely sources of dust, along with recommended primary and secondary control measures:

- **Disposal Operations -**
  - Primary Control Measure: Apply water to unpaved roads as necessary, enforce speed posted limit on site.
  - Secondary Control Measure: Apply dust surfactant to unpaved portions of the facility, provide additional pavement.

- **Excavations -**
  - Primary Control Measure: Pre-water areas prior to excavation. Water areas of excavation and haul roads during and at end of day to form crust.
  - Secondary Control Measure: Phase work to reduce the amount of disturbed surfaces, apply additional water, work when wind velocity is low.
- **Stockpiles -**
  - Primary Control Measure: Pre-water areas prior to excavation. Apply water to short-term stockpiles to form crust.
  - Secondary Control Measure: Control vehicle access to the area. Apply dust surfactant to long term stockpiles and apply seed/mulch to prevent erosion.
- **Track out extending onto public roadways –**
  - Primary Control Measure: Paved on-site entrance road
  - Secondary Control Measure: Apply recycled asphalt, gravel pads or similar at the transition from unpaved to paved roadways.
- **Unpaved roadways and parking areas –**
  - Primary Control Measure: Limit vehicle speed via posting speed limits, apply water.
  - Secondary Control Measure: Apply surfactants to unpaved roads and parking lots, as needed, provide additional pavement.

5.4 Minor Spills/Releases

The spill or release of a potentially hazardous material at BDI is most likely to involve fuel or various vehicle maintenance materials (i.e., engine oil, hydraulic oil, antifreeze, etc.). Other materials most likely to present a concern as a result of normal operations include petroleum products and petroleum wastes brought into the facility. Spills involving these types of materials could occur during fueling, routine maintenance operations or during unloading or processing of waste. These minor spills will be cleaned up immediately upon discovery. BDI maintains on site a minor spill clean-up kit that contains absorbent materials, shovels, and small containment buckets. Waste materials resulting from the minor spill and clean-up will be handled and disposed of in accordance with the Facility Oil Field Waste Management Plan (**Volume II, Section 2**). Although highly unlikely, large spill/releases from pond and tanks on site may occur. The response procedures for this type of release are detailed in the Facility Contingency Plan (**Volume II, Section 5**).

6.0 WASTE STREAM & PROCESSING

6.1 Operational Rate

The current operational rate for the BDI facility is estimated to be 11,000 barrels per day (bbl/day). The operational rate will increase by 4,500 bbl/day upon approval of the Application for Modification, bringing the total operational rate to > 15,500 bbl/day.

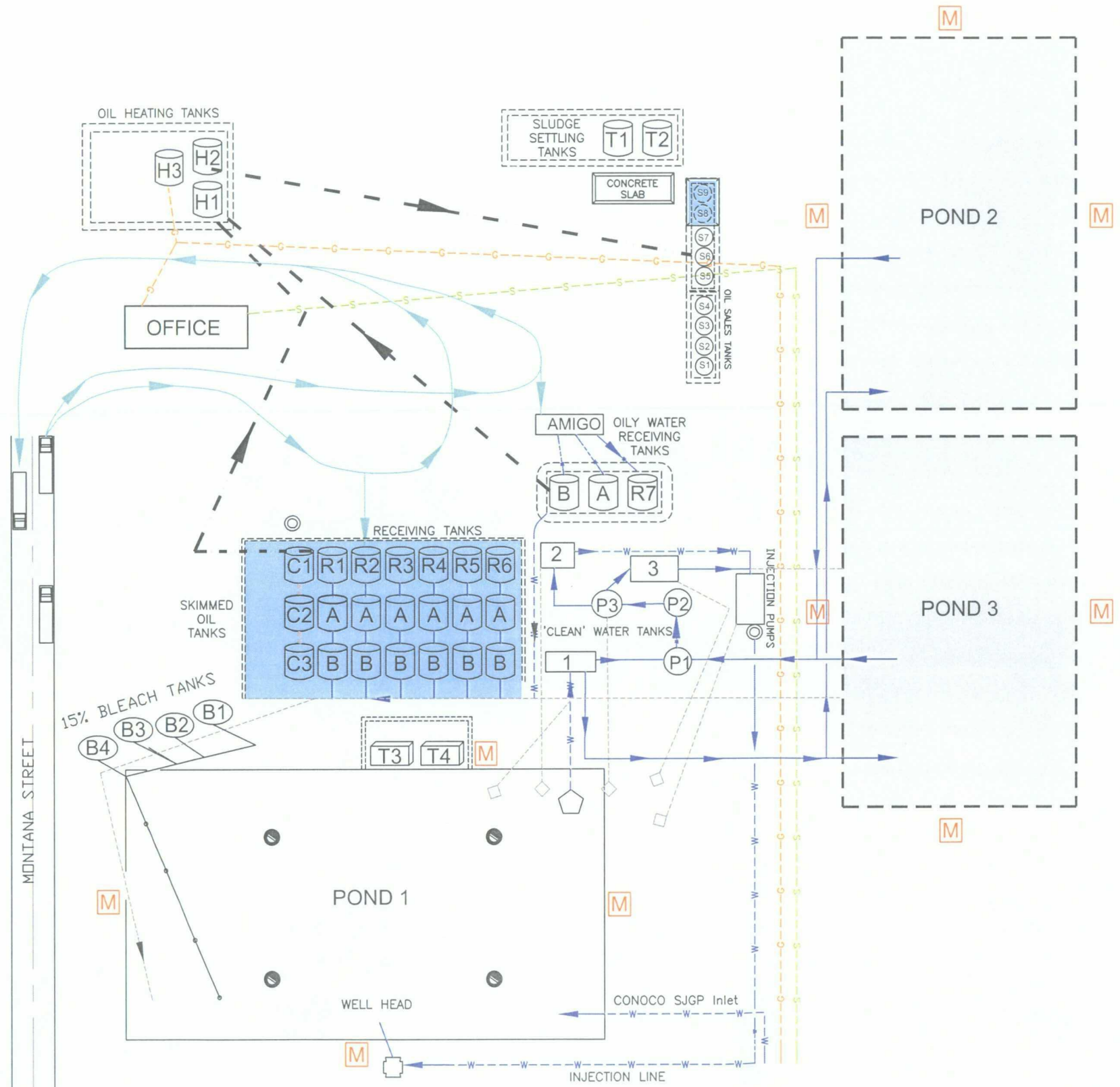
6.2 Processing

The Process Flow Diagram provided as **Figure II.1.3** shows the layout of the BDI receiving and processing facilities. All receiving activities will take place within the BDI fenced facility. The receiving tanks are depicted on **Figure II.1.3.**

The Process Flow Diagram details the origin and destination for the received oil field waste materials. **Table II.1.3** is a list of on-site equipment and tanks used for waste receiving, processing, and disposal. Oil Field liquid waste will be stored temporarily in tanks and processed at the rates described on **Table II.1.3**. Depending on the evaporation rate in the ponds and the operational rate of the injection well, if operations warrant, and when tanks and ponds are at capacity, acceptance of oil field waste will be temporally suspended. Should this occur, BDI may request approval from the OCD to install additional temporary tanks.

TABLE II.1.3
Equipment Process List

Description	Number	Capacity
Receiving Tanks	18	400 bbl each
Skimmed Oil Tanks	3	400 bbl each
Oil Heating Tanks	3	400 bbl each
Oil Sales Tanks	9	400 bbl each
Oily Water Receiving Tanks	3	400 bbl each
Clean Water Tanks	4	400 bbl each
Bleach Tanks	4	400 bbl each
Evaporation Ponds	3	109,860 bbl (existing)
Spray Systems	2	15500 bbl/day
Injection Well System	1	11000 bbl/day
Sludge Settling Tanks	2	300 bbl



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Oil Conservation Division

LEGEND

- SEWER
- GAS
- OIL
- WATER
- PROCESS FLOW DIRECTION
- DELIVERY VEHICLE ROUTE
- OVERFLOW
- LINED BERMS
- AREA OF PLANNED IMPROVEMENTS
- M — H_2S MONITORING LOCATION
- AERATOR
- PUMP
- EXISTING RECEIVING TANK
- EXISTING TANK
- SUMP
- STRUCTURE

NOTE: ELEMENTS ARE LABELED IN ACCORDANCE WITH THE UPDATED NOMENCLATURE (11/08, ATTANCHMENT III.1.F)

NORTH
NOT TO SCALE

PROCESS FLOW DIAGRAM

BASIN DISPOSAL, INC.
BLOOMFIELD, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 08/20/09	CAD: PROCESS FIGS.dwg	PROJECT #: 520.01.01
DRAWN BY: GEI	REVIEWED BY: MRH	FIGURE II.1.3
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\520.01.01\FIGURES\PROCESS FIGS.dwg
Date/Time:Aug. 20, 2009-13:06:19

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AUG 27 2009
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Oil Conservation Division

Specifications for the spray systems, photos of a sprayer similar to the ones planned for installation at the BDI Evaporation Ponds, and specifications for the injection well are included in **Attachment II.1.B**. All receiving and storage tanks used at BDI will be leak-proof and manufactured of non-biodegradable materials including steel. Evaporation pond primary liner, leak detection and secondary liner systems are constructed of HDPE (**Volume III, Sections 1** and **2**).

7.0 INSPECTION AND MAINTENANCE

7.1 Evaporation Pond Leak Detection System

Inspection of the physical condition of the evaporation ponds is typically conducted on a daily basis as a matter of routine (**Attachment II.1.D**). A more thorough inspection of the leak detection system and sump will be conducted on a monthly basis and documented on the Pond Integrity/Leak Detection Inspection Form included in **Attachment II.1.C**. At a minimum the following items will be documented:

- Inspection date
- Inspector name
- Depth of liquids in sump
- Sump and piping condition and status

Prior to placing a newly constructed pond or an evaporation pond that has undergone repair or cleaning into service, liquids will be removed from above the primary liner and from the leak detection system. Once in service, it is anticipated liquid may be present at all times due to condensation and normal leakage through the primary liner. The sumps are 2 feet deep and have a capacity of >1,200 gallons using a porosity of 0.35 for the granular material. **Attachment II.1.E** is a summary table from an authoritative publication on potential geomembrane liner leakage for 40 mil HDPE lined ponds. As shown on the table, the combined projected permeation/pinhole leakage rate ranges from 9.5 to 138 gal/acre/day. Using a very conservative value of 75 gal/acre/day for the combined leakage/permeation rate (**Attachment II.1.E**), this provides 16 days of storage at a depth of 2' in the sump. The rate of 75 gal/acre/day is considered very conservative as it is based on 40 mil HDPE (vs. the actual 60 mil); a fluid depth of 10'; and a high number of large pin holes. As additional protection, a GCL will be installed under the leak detection sumps (**Volume III, Section 1, Section 3.0 and Permit Plans**).

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Initially BDI will monitor the liquid levels in the sumps every two (2) week immediately after ponds are put into service and documented. Should the lack of liquids become apparent after a series of inspections, the monitoring frequency will be extended to monthly. Upon discovery of excessive (i.e., >2') liquid presence in a leak detection system, the Division will be notified within 24 hours and the affected pond area drained. Prior to placing the pond back into service, the facility will initiate corrective action which may include but is not limited to:

- actions undertaken to locate source of leakage
- repair procedures
- additional sump liquid level monitoring and pumping frequencies
- liquids testing
- groundwater monitoring (if required)

7.2 Evaporation Pond Containment System

The structural physical condition is typically inspected on a daily basis as a routine matter (**Attachment II.1.D**). A more thorough inspection of the berms and the outside walls of pond levees will be conducted at least quarterly, and after any major rainfall or windstorm. For purposes of this inspection frequency, a major rainfall is defined as a documented 25-year, 24-hour rainfall event, and a major windstorm is defined as sustained wind speeds in excess of 45 miles per hour. The inspections will be documented and retained on the Pond Integrity/Leak Detection Inspection Form included in **Attachment II.1.C**. At a minimum the inspection shall consist of the following:

- Inspection date
- Inspector name
- Rainfall amount (if any)
- Wind speed and direction (if any)
- Damage assessment (if any)

The inspection will address any erosion, liner damage and any maintenance required with a timeframe to complete required repairs. In addition, the depth of sludge build-up in the bottom of the pond will be measured during the quarterly inspections and documented. Sludge in excess of twelve (12) inches will be removed and disposed of at an OCD approved facility.

7.3 Tank Farm and Pump System

In compliance with the Facility Spill Prevention, Control, and Countermeasures (SPCC) Plan that applies to petroleum product storage and distribution systems, BDI will conduct monthly inspections of the tank farm. At a minimum the inspections will include and document the following:

- Containment berm and liner condition
- Tank condition
- Annual tank leak test conducted as required
- Proper signage
- Pipe and valve condition
- Sump condition

Any items identified during inspections which require corrective action will be addressed immediately, and if required the specific process equipment will be taken offline until repairs are completed. Below-grade sumps will be cleaned and inspected annually. If the sump integrity has failed, the OCD will be notified within 48 hours of discovery, and the sump contents and contaminated sediments will be removed and disposed of at an OCD approved facility. BDI will submit a report to the OCD describing subsequent investigations and remedial actions taken.

7.4 Evaporation Spray and Injection Well Systems

The evaporation spray and injection well system are inspected on a daily basis with maintenance performed on an as needed basis but not exceeding monthly. The inspections are documented on the BDI Daily Plant Operational Inspection form included as **Attachment II.1.D**. At a minimum the following items are checked during the daily inspection:

- 20 um filter
- 5 um filter
- Spray system weather station (set at 15 mph)
- Spray system plume height
- Injection well pump pressure (max 1600 psi at borehole)

Filters will be changed out on an as need basis. The spray systems will be only used during daylight hours and when an attendant is on site. The plume height will be adjusted to a height that contains over-spray within the confines of the lined portion of the pond.

7.5 Below-grade Tanks and Sumps

The two below-grade sumps are inspected on a daily basis with maintenance performed on an as-needed basis but not exceeding monthly. The inspections are documented on the BDI Daily Plant Operational Inspection form included as **Attachment II.1.D**. At a minimum the following items are checked during the daily inspection:

- Cover grate condition
- Primary holding tank liquid/sludge level
- Primary holding tank condition
- Secondary tank liquid level

8.0 EMERGENCY SITUATIONS AND EQUIPMENT BREAKDOWN

Response to emergency situations discovered during routine and scheduled inspections include the actions of the Emergency Coordinator, fire prevention and protection, incident response, and notification procedures as described in the BDI Contingency Plans (**Volume II, Section 5**).

8.1 Equipment Breakdown

In the ease of unplanned equipment downtime, the following measures will be deployed:

- Delivery of oil field waste may be delayed, using storage capacity available in the receiving tanks.
- Downtime associated with mobile equipment (i.e., skid-steer loader, forklift) will be addressed by deploying alternative on-site units (e.g., end loaders) and arrangements with local equipment vendors for immediate maintenance and lease of temporary replacement units.
- BDI's preventive maintenance plan has been highly effective at preventing unplanned downtime through routine inspection and regular maintenance of processing equipment.

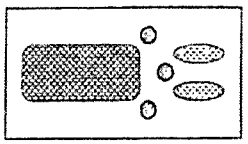
9.0 RECORD KEEPING REQUIREMENTS

BDI is required to keep detailed records for this facility. In addition, the facility will meet the OCD requirements for reporting as detailed in the Management Plans provided elsewhere in this Application. All records will be retained for at least 5 years and made available for OCD review and inspection.

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.A
SAFETY COMMUNICATIONS PROGRAM



BASIN DISPOSAL, INC.

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"
P.O. BOX 100 - AZTEC, NEW MEXICO 87410 - PHONE: (505) 334-3013

SAFETY COMMUNICATIONS PROGRAM

SAFETY MEETING ATTENDANCE SHEET

Date: _____ Time: _____

Topic: _____

Presenter: _____ Department: _____

Printed Name	Signature

Instructions:

1. This form must be completed at each safety meeting.
2. Make additional copies as required.
3. Keep copy of completed attendance sheets in binder.

Absent	Date Covered

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SAFETY COMMUNICATIONS PROGRAM[1]

TRAINING SCHEDULE 2008

Month	Yard Topics	Office Topics
January	Lockout/Tagout Program SWPPP Good Housekeeping	Lockout/Tagout Program SWPPP Good Housekeeping
February	Material Acceptance & Handling Form C-133 & C-138 reconciliation H_2S screening	Material Acceptance & Handling Form C-133 & C-138 reconciliation H_2S screening
March	Non-exempt liquids recognition H_2S Treatment Procedures	Non-exempt liquids recognition H_2S Treatment Procedures
April	Site Contingency Plan H_2S Contingency Plan Hazard Communications Emergency Evacuation Drill	Site Contingency Plan H_2S Contingency Plan Hazard Communications Emergency Evacuation Drill
May	Spill Prevention & Control Site Generated Waste Disposal Heat Stress	Spill Prevention & Control Site Generated Waste Disposal Heat Stress
June	Confined Space Site Inspection Incident & Injury reporting First Aid/Bloodborne Pathogens	Confined Space Site Inspection Incident & Injury reporting First Aid/Bloodborne Pathogens
July	Migratory Bird Prevention	Migratory Bird Prevention
August	Employee Safety PPE 3-Point Contact	Employee Safety PPE 3-Point Contact

[1] Training schedule and content subject to change.

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SAFETY COMMUNICATIONS PROGRAM[1]

TRAINING SCHEDULE 2008 (CONT.)

Month	Yard Topics	Office Topics
September	Industrial Powered Trucks Skid Loader Sky Trak Loader High Voltage Training	Recordkeeping
October	Cold Weather Stress Fire Extinguisher Use	Cold Weather Stress Fire Extinguisher Use
November	Sexual Harassment Drug & Alcohol Cell Phone usage	Sexual Harassment Drug & Alcohol Cell Phone usage
December	Employee Benefits Temp. Employee Safety	Employee Benefits Temp. Employee Safety

[1] Training schedule and content subject to change

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.B
EQUIPMENT SPECIFICATIONS

RESOURCE WEST

Applied H_2O Solutions

Apex Installation Instructions

The Apex evaporator you have purchased is a very simple system to install. The Apex comes with a single electrical control panel that has the starters for both the fan and pump motors in a weather tight stainless steal enclosure. This control box is equipped with separate start and stop buttons for the pump and fan motors plus an external disconnect lever. If your evaporator was purchased with a wind station it will also have an HOA (hand-off-auto) switch located on the front cover of the control box. The disconnect lever will need to be moved to the on position to run the motors. Your Apex can be operated at any time without using the wind station by turning the HOA to the hand position and using the start stop buttons on the front of the control box. To operate the Apex with the wind station, make sure your wind station is connected properly and is turned on. Next turn the HOA on the main control box to the auto position. The Apex will turn on and off by itself being controlled by the wind station, while the start and stop buttons on the main control panel will be disabled. There could be slight delays in start up due to time delays built into the programming of the wind station.

Before placing the Apex into the pit adjust the pump by lowering the chains from both sides to full length and hook in the chain into the hooks on the frame. By keeping the same number of links from the frame u-bolts to the chain hooks the pump will hang at a 15° angle for proper operation. If you need a shallower setting keep the same number of links from the frame to the chain hook to maintain the correct pump angle. Be sure that the water level is deep enough to drop the pump without dragging it along the bottom of the impoundment pond.

Floats need to be strapped with plastic ties every 20' to 25' to the two cables coming from the Apex. Nylon ropes need to be attached on all outside corners of the frame.

The Apex has been pre-wired at RWI so the fan and pump rotation is wired correctly. The only electrical connections required will be at the point of the power source. There will be three power cables and one ground. Correct clockwise rotation of the fan and pump must be verified (fan will rotate clockwise when looking down on the top of the Apex). If the fan is rotating in the wrong direction, shut off power to the control box and change any 2 power supply wires to reverse direction at the power source. Reapply power and recheck direction. The fan template start button activates the fan and should always be started first. After the fan has run for 5 seconds, start the pump.

If you have purchased a wind station with your Apex you will need to refer to the "Wind Station Set Up Instructions" for proper set and wiring information. This guide will also walk you through programming your new wind station.

Thank you for your purchase and commitment to RWI and our evaporation efforts. If you have any questions, comments or concerns with your new equipment please call RWI @ 1-866-956-WEST.

RESOURCE WEST

Applied H_2O Solutions

Apex Warranty and Maintenance

Generally, Resource West Inc. Apex evaporators will be repaired or warranted as specified below;

The obligation of Resource West, Inc. (RWI) to the purchaser under this warranty is limited to the repair and replacement of defective parts by Resource West, Inc. free of charge for both parts and labor, using genuine RWI replacement parts. Repair or replacement in accordance with this warranty shall constitute fulfillment of all liabilities of RWI .

This warranty will not apply if the following situations occur:

1. If the unit has been subject to misapplication, abuse, misuse, negligence, fire or other accident.

2. If parts not made or supplied by RWI have been used in connection with the unit and if in the sole judgment of RWI, such use adversely affects its performance, stability or reliability.

3. If the unit has been modified or altered without permission from RWI.

The customer will be responsible for payment of travel time and shipping costs to suitable location for repairs. This warranty does not cover shipping costs or travel costs or time loss due to failure.

This warranty does not cover normal maintenance and servicing. (eg. cleaning, de-scaling, grease points, or coupler alignments.) This warranty does not cover normal wear or surface finish damage due to exposure to harsh environments or chemicals, unless determined by RWI that they resulted from defective materials or workmanship.

Resource West, Inc. warrants the retail purchaser of each new product as listed below, that it will repair or have repaired or replace any part thereof found to be defective in materials or workmanship within 1 year. This warranty is for the benefits of the original purchaser only when purchased from RWI.

Motor: 12 months warranty, parts and labor; any defect in material or workmanship; when properly used for a period of one year after delivery. It is the end user's responsibility to ship to and from RWI the suspected faulty motor. F.O. B. RWI, Grand Junction, Colorado.

RESOURCE WEST

Applied H_2O Solutions

Pump: One year from delivery, manufacturer's defects only. F.O.B. RWI, Grand Junction, Colorado

Fan and Frame: Defects in workmanship and/or structural damage, for a period of one year from delivery. F.O.B. RWI, Grand Junction, Colorado

The warranty period will begin on the date of delivery.

Repairs can be performed at your location following the pay structure below.

$2.25 per mile one way with truck (includes one man)
$2.50 per mile one way with truck and trailer (includes one man)
$25.00 per hour drive time for second man

Monthly Maintenance

1. Inspect fan and frame for any structural damage or scale build up. This build up on the fan can cause an unbalanced problem and can be cleaned with a 10% muriatic acid and water mixture.
2. Grease the fan motor with 3 to 6 grams of Mobil Polyrex Grease. (Available at most Napa stores)
3. Check spray ring for scale build up and observe the pump for signs of the pump plugging.

Annual Maintenance

1. Remove Apex from pit and inspect for any structural damage to fan, frame and pump.
2. Remove pump from housing to inspect and clean any debris. Care should be taken not to cut or nick electrical wires.
3. Winter maintenance: remove from pit, drain the pump and grease the fan motor.

ALWAYS DISCONNECT POWER PRIOR TO ANY MAINTENANCE BEING PERFORMED

RESOURCE WEST
GRAND JUNCTION, CO

APEX EVAPORATION UNIT

Apex Price	$21,950.00
Weather Station	$2,950.00

Total Price with Weather Station: $24,900.00

General Specifications for the Apex

Power Source	460 3 phase	
Power cord from the unit to control panel	150' 8 gauge fan	
Fan hp	25hp	
Pump hp	7.5hp	
Pump rate (gpm)	85	
*Estimated evaporation rate at 100% gals / bbls	122,388 gals	2914 bbls
*Estimated evaporation rate at 80% gals / bbls	97,910 gals	2332 bbls
*Estimated evaporation rate at 20% gals / bbls	24,477 gals	583 bbls
Required Depth	18"	
Water Plume	20'-25' vertical	
Platform	Float	
Generator recommendation	45kw	

*The above estimated evaporation rates are only percentages of possible evaporation running 24 hours. Evaporation is based on ambient temperatures, humidity and wind.

AUTOMATED WEATHER STATIONS

The weather station allows site programming of wind speed and direction to automatically start-up and shut down the pump and fan, when applicable, at pre-set wind speeds and directions. This allows the user more control over mist remaining inside the pit, allowing your system to operate longer and evaporate more water.

Aztec, New Mexico

Objective: Size Aqua-Jet for given situation.

Design Data:

Basin Volume: 3.7 MG

Lined with membrane

Design Calculations:

Use 4 HP/MG for O_2 dispersion

(3.7 MG) (4 HP/MG) = 14.8 HP

Recommendation:

Eight (8) 2 HP Aqua-Jet Aerators
with anti-erosion assemblies.

NOTE: 2 ft is the recommended minimum operating depth.

JDM/JEG/rh
3-22-89

STAINLESS STEEL
AERATOR SPECIFICATIONS

1. GENERAL

Furnish and install 8 2 HP floating aerators. Each aerator shall consist of a motor, a direct drive impeller driven at a constant speed and an integral flotation unit.

2. AERATOR DRIVE MOTOR

2.1 The motor shall deliver 2 horsepower and shall be wired for 230/460 volts, 60 cycle, three phase service.

2.2 The motor shall be totally enclosed, fan cooled, and generally rated for severe chemical duty, and shall have a 1.15 service factor.

2.3 The motor windings shall be nonhygroscopic, and insulation shall equal or exceed NEMA Class "F".

2.4 A condensate drain shall be located at the lowest point in the lower end-bell housing.

2.5 A labyrinth seal shall be provided below the bottom bearing to prevent moisture from penetrating around the motor shaft.

2.6 All motor frame parting surfaces shall be deep registered and Permatex sealed.

2.7 All through bolts, nuts, and screws shall be of type 18-8 stainless steel.

2.8 A stainless steel nameplate shall be provided with each motor and shall be securely fastened thereto. the voltage, speed, insulation class, amperage, service factor, wiring diagram, motor serial number, and the manufacturer's name and address shall be steel stamped or otherwise permanently marked.

3. MOTOR SHAFT

3.1 Unit shall have a one-piece motor shaft continuous from the top motor bearing, through the lower bearing and down to and through the propeller. This shaft will be manufactured from 17-4 PH stainless steel, or comparable stainless steel having a minimum yield strength of 100,000 psi on units 3 HP and larger. For 1 and 2 HP units, this shaft will be manufactured from 303 stainless steel, or comparable stainless steel having a minimum yield strength of 30,000 psi.

4. RPM

Units shall operate at the lowest RPM offered in this size by the manufacturer. In no case shall nominal RPM exceed 1800 for units meeting the one-piece shaft specified above. Units featuring one-

piece shaft shall operate nominally at 1800 RPM in the size range of 1-15 HP, or at a nominal maximum speed of 1200 RPM for units in the 20-75 HP size range.

5. MOTOR BEARING

5.1 Motor bearings shall be regreasable. Sealed bearings are not acceptable and bearings shall be shielded on the bottom side only.

5.2 The top and bottom motor bearings shall be of the combined radial and axial thrust type and shall be packed at the factory with CHEVRON SRI-2 grease (or an approved equivalent lithium-base waterproof grease).

5.3 The lower motor bearing inner race shall be locked to the motor shaft via a special washer and locking nut arrangement. The shaft shall be threaded just below the lower bearing and shall have a keyway cut into the motor shaft. this key shall accept a tab from the I.D. of the locking washer, and the locking nut shall have recesses to accept a tab from the O.D. of the locking washer to prevent the nut from backing off. Snap ring type bearing retainers will not be acceptable.

6. DIFFUSER HEAD

6.1 The design of the diffuser head shall be such that the liquid spray will discharge at an angle of 90° to the motor shaft, and over a 360° pattern in the horizontal plane, and shall be a stainless steel monolithic casting.

6.2 The diffuser head casting shall act as a base for the aerator motor, and alignment of the motor to this base shall be controlled by machined index fittings that engage the P-base of the motor. Diffuser head/motor arrangements that are dependent upon bolt holes only for alignment will not be acceptable.

6.3 The diffuser head casting shall act as a thrust block to deflect the high velocity, pumped volume of the aerator from the vertical to the horizontal direction. In order to minimize vibration, to provide adequate strength, the diffuser head casting shall weigh no less than _____ lbs. The bottom side of this casting shall have a 90° radiused transition to effect the hydraulic change in direction with a minimum of head loss.

6.4 The diffuser head shall absorb all normal and shock loads encountered by the propeller, and transmitted to the diffuser head via the motor shaft and lower motor end-bell. The diffuser head shall distribute these forces into the float via webs that terminate in a flange or ring that is an

integral part of the diffuser head. This flange shall mate with a similar flange that is an integral part of the float/volute to spread the stresses generated by the propeller uniformly around the float so that no point loading of the float is allowed. These flanges shall be machined flat to provide proper bearing surfaces. The alignment of the diffuser head flange to the float/volute shall be by use of an index pilot; and, bolt holes only shall not be acceptable.

6.5 Specifically, diffuser head designs that employ studs and spacers, or shoulder bolts are not allowed. Load bearing flange-to-flange connections will be mandatory.

NOTE:

Aqua-Aerobic Systems strongly recommends the following language be incorporated into the aerator specification.

6.6 The diffuser head shall contain an anti-deflection journal insert to limit the radial deflection of the motor shaft.

6.7 This anti-deflection journal insert shall be located in the lower extremity of the diffusion head, approximately one-half the distance between the motor base and the lower end of the shaft.

6.8 The journal insert shall be machined from Delrin and shall be a minimum of 0.020" larger through the bore than the diameter of the motor shaft.

6.9 Units featuring a one-piece unsupported shaft will not be acceptable.

6.10 There shall be a fluid deflector located on the motor shaft immediately below the anti-deflection journal, which shall cover completely the anti-deflection journal insert and the lower portion of the diffusion head.

6.11 This fluid deflector shall be molded from black neoprene and shall be press fit onto the motor shaft.

7. FLOTATION

7.1 Each aerator shall have 200 lbs. reserve buoyancy to insure stability and to provide support flotation required during aerator servicing. Floats shall be one-piece, i.e. segmented floats are not acceptable.

7.2 Flotation stability will be mandatory. Under no circumstances will unstable flotation designs requiring counter balancing or ballast of liquid or solid mass or weight displacement be acceptable. Only aerators demonstrating stable operational characteristics, without rocking or oscillating and causing mooring stress, will be acceptable.

7.3 The float shall be fabricated of a minimum of 14 gauge 304 stainless steel.

7.4 The float shall be constructed so that all stress imposed from wave action and mooring line tension shall be transmitted from each mooring line to another by pulling across the float in such a manner as not to "flex" the structure.

7.5 All floats shall be constructed so that the internal void can be filled full of closed cell polyurethane foam having a minimum 2.0 lbs./ft^3 density and shall be completely sealed water tight.

7.6 All floats shall have six mooring points, spaced for 3 or 4-point mooring around the outer circumference. No mooring connections will be allowed as imbedments in the upper or lower float covers. Only tension type connections perpendicular to the outer sidewall will be approved. All mooring connections shall be stainless steel.

7.7 The float construction shall be such that the volute will distribute the load of the entire motor, drive, diffusion head and volute static load plus; the entire dynamic load from the propeller thrust and radial forces by spreading these forces uniformly around the full 360° circumference of the float's central core. Point connected joints or point stressed connections will not be accepted.

8. PROPELLER

8.1 The propeller shall be a precision casting of 316 stainless steel, and shall be specifically designed for the application intended. It shall be a self-cleaning type that will not accumulate fibers, rags, stringy materials, etc.

8.2 Each propeller blade shall be pitched so that the pitch angle and rake angle are within ± 2 percent of the other blade(s).

8.3 The propeller shall be pitched so that the drive motor is loaded between 88% and 95% of full-load nameplate horsepower.

9. VOLUTE

9.1 The propeller shall operate in a volute made of 304 stainless steel. It shall be round and true so that propeller blade tip clearance is uniform within the volute as is it rotates. The volute shall have a minimum of 3/16 inch wall thickness and a minimum of four full-length stainless steel gussets shall be welded on 90° spacing around the circumference of the volute between the top and bottom flanges.

9.2 The volute shall have a large flange at its top extremity that completely encircles the volute, and this flange shall match a similar flange on the bottom of the diffuser head to provide for a bolted, machined flange-to-flange fit to provide uniform distribution of the dynamic loads generated by the propeller and the static weight of the motor and drive. A machined index in the upper flange shall provide concentric alignment of the propeller in the volute by engaging the inside diameter of the mating flange on the diffusion head. Bolt holes alone will not be acceptable to locate the important alignment of the propeller.

9.3 Fiberglass volutes, or carbon steel volutes or carbon steel volutes that are fiberglass or stainless steel lined are not acceptable.

10. INTAKE CONE

10.1 The intake cone shall be fabricated from 304 stainless steel having a gradually expanding opening outward to the intake end. The length and inlet diameter shall be sufficient to provide uniform inlet hydraulics so that no increase in vibration is caused due to its' shape or size.

10.2 The material used to fabricate the intake cone shall be structurally sufficient to support the weight of the entire aerator assembly when the aerator is free-standing on dry ground.

10.3 For maximum in-depth mixing efficiency, the intake cone shall be designed so that the suction lift from the aerator propeller is vertical from the liquid depth below the aerator. Unless specifically required for anti-erosion requirements, side or angle entry suction inlets will not be approved.

11. BALANCING

The entire rotating assembly including the motor rotor, shaft and impeller shall be dynamically balanced to within 2.0 mils peak-to-peak horizontal displacement measured at the upper and lower motor bearing. Measurements shall be taken at a frequency equivalent to the motor RPM.

Measurements shall be taken with the motor in a vertical, shaft down position and with the motor or the entire power section mounted on resilient pads. Certified copies of the balance inspection shall be supplied with each aerator.

12. MOORING

12.1 The anchor cable shall be installed as recommended by the manufacturer so the aerator shall be permitted to rise and fall with water level variations, but will have a minimum of lateral movement.

12.2 The maximum amount of anticipated water level variation is _____ feet.

12.3 Anchor cable shall be 7 X 19 construction, 304 stainless steel and 3/16" diameter.

12.4 Mooring hardware (thimbles and clips) shall be of 316 stainless steel. Galvanized hardware is not acceptable.

13. ELECTRICAL SERVICE CABLE

13.1 Each unit shall be furnished with _____ feet of AWG # 12 four conductor, continuous length (non-spliced) underwater electric service cable.

13.2 The aerator manufacturer shall furnish the cable, with the motor end sealed into the motor terminal box, and wired for 230/460 volt service. The aerator manufacturer shall be responsible for this watertight seal and electrical connection. The other end of the cable will be wired into the power supply by the installing contractor.

13.3 Only flexible type copper stranded cable with four individually jacketed conductors bound together with a non-wicking filler and sheathed in a PVC, neoprene or approved equal over jacket will be approved.

14. INSTALLATION, OPERATING, AND MAINTENANCE MANUALS

14.1 The aerator manufacturer shall provide _____ copies of a detailed manual that shall include specific instructions for receiving and handling, assembly, mooring, wiring, installation, repair and service, storage, troubleshooting, detailed exploded drawings of the unit, and a full parts list.

14.2 In addition, the manual shall contain complete detailed instructions on the balancing procedure to be used for rebalancing to the propeller after is has been in service for an extended period of time. These instructions shall include, but not be limited to, a general procedural description, a detailed explanation of preparing the unit for balancing, for setting up the dynamic balancer, portable balancing technique, a detailed description of the vector chart method of single plane balancing and sample balancing record forms.

14.3 These manuals shall be submitted for review, along with other general submittal information, including detailed drawings, brochures, cut-sheets, motor data sheets, etc., as a part of the approval process.

15. MANUFACTURER

Aqua-Aerobic Systems, Inc.'s Aqua-Jet Aerator has been selected as a standard for comparison, and is viewed to be ideal for this application.

16. EQUIPMENT SELECTION - COMPLIANCE WITH THE SPECIFICATIONS

Detailed specifications have been set forth herein, and are to be adhered to in all respects. Absolutely no deviations from the specifications will be approved. Manufacturers wishing to submit equipment for consideration should furnish the general contractor with a statement as follows: "(Company Name) certifies that its offering is in full compliance with all details of the equipment specification and wishes to offer this equipment for considerations. Should the equipment be rejected as not complying with the specification, (Company Name) will be financially responsible for the difference between our quoted price and the next lowest responsible bid that meets the equipment specification." This document shall be furnished to all bidding contractors prior to the bid opening, and shall be duly signed by an officer of the company.

17. EXPERIENCE

17.1 Manufacturers proposing to furnish equipment for this project shall have three installations of similar equipment model and size in similar service for a period of three years.

17.2 Equipment manufacturers not meeting this requirement are invited to bid, provided they furnish an unconditional guarantee, underwritten by a bonding agent acceptable to the city for a period of three years. Equipment and/or components failing within this period due to deficiency in design, workmanship or material shall be replaced at no cost to the owner, and said replacement shall be guaranteed for three years continuous service.

18. PERFORMANCE

18.1 Each aerator shall be capable of transferring oxygen at the rate of 3.0 lbs./HP/hr as determined by the unsteady state test technique at the standard conditions of zero dissolved oxygen, 1 ATM pressure and 20°C.

18.2 Each aerator shall provide sufficient kinetic energy to the basin to provide uniform oxygen dispersion such that any given dissolved oxygen sample taken at random from the basin shall not vary more than 2 mg/l or 20% (whichever is greater) from the average of 10 samples simultaneously drawn at random from the basin.

18.3 Each aerator shall deliver a minimum of 88% and a maximum of 94% of nameplate horsepower as evidenced by measured operating amp load and voltage readings. Horsepower shall be computed by:

$$HP = \frac{(1.732)\ (amps)\ (volts)\ (E)\ (P.F.)}{746}$$ Where:

HP = Delivered horsepower

E = Efficiency of motor (nameplate rating)

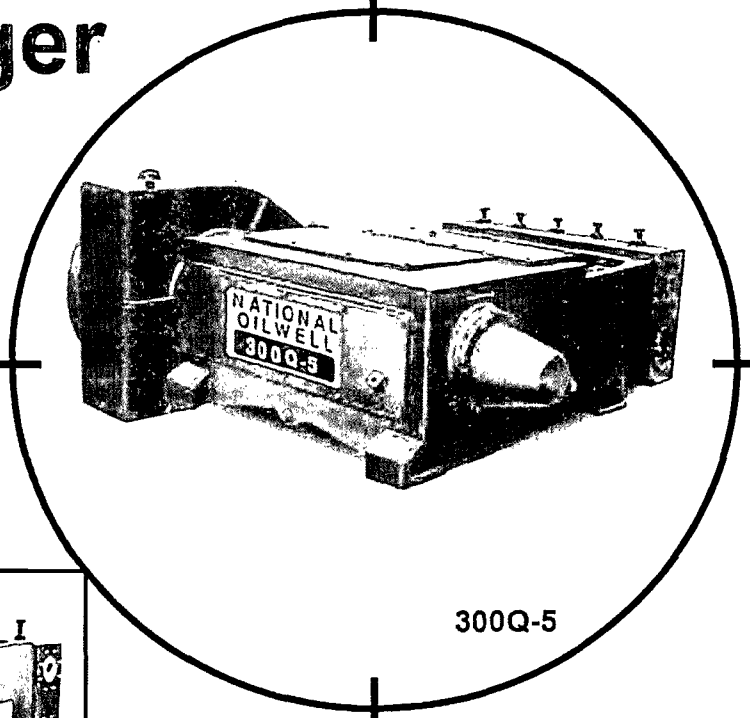
P.F. = Power factor of motor (certified by motor manufacturer)

18.4 The aerator manufacturer shall certify that the nameplate data on the aerator motor is valid specific data pertinent to that particular motor and that such nameplate data originates from the motor manufacturer and that no nameplate data changes have been made subsequent to the motor being shipped from the original motor manufacturer.

NATIONAL OILWELL VARCO

Multiplex Plunger Pumps

Installation, Care and Operation Manual



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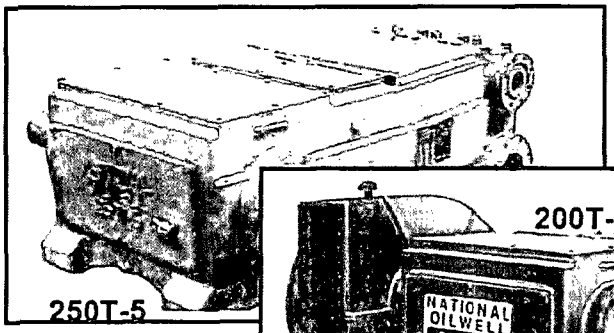
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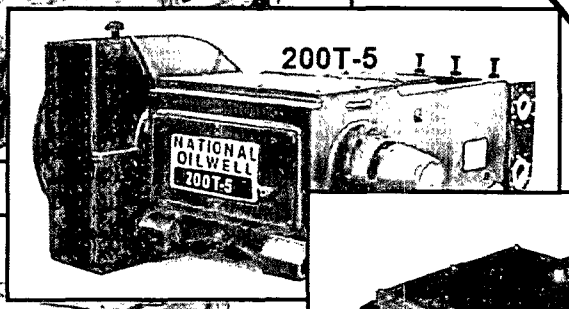

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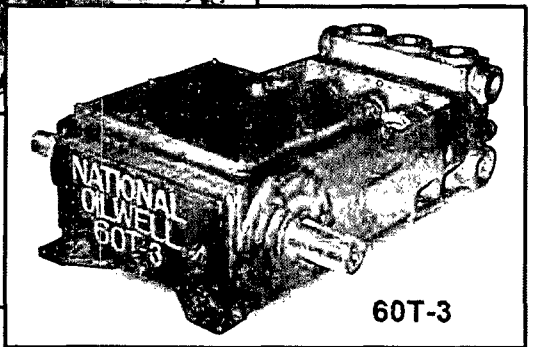

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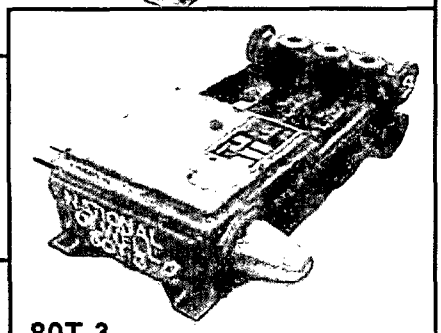
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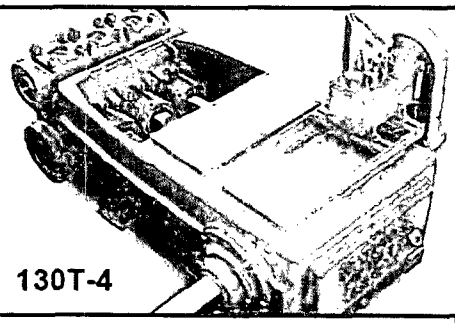
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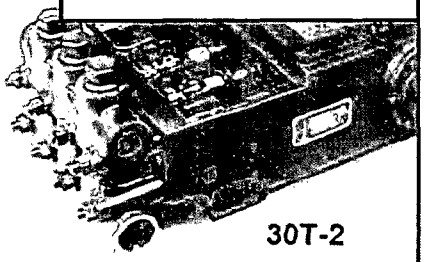
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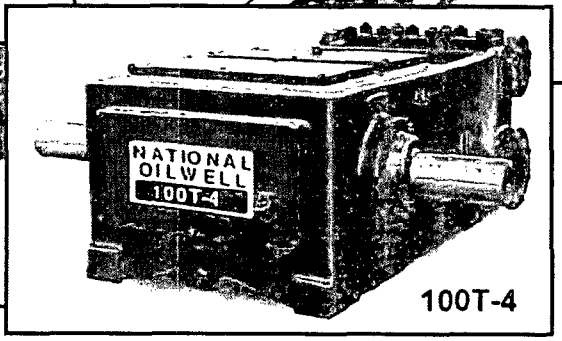


100T-4

Covering the following pumps:

30T-2
60T-3
80T-3 Atex Certified
100T-4
130T-4
165T-5
200T-5
250T-5
300Q-5 Atex Certified

Sales / Technical Information

USA Tollfree: 1-800-324-4706
Phone: 1 (918) 447-4600
Fax: 1 (918) 447-4677
Internet: http://www.nov.com

P.O. Box 4638 Houston, Texas 77210-4638

REVISED: July 17, 2008
REVISED: August 19, 2005
ISSUE: September 15, 2003

NATIONAL OILWELL VARCO

SUPPLEMENT FOR
ALL PUMP MANUALS

⚠! WARNING !⚠

PRESSURE

RELIEF

VALVES

⚠! NOTICE !⚠

Our technical publications relative to reciprocating pumps state that pressure relief valves must be installed in the discharge systems from these units. This supplement is issued to emphasize the importance of relieving the discharge system of all pressure which exceeds the rated working pressure applied by the manufacturer to the specific pistons and liners (or plungers and packing) in any particular unit.

⚠! WARNING ! ⚠

For the protection of persons and property the discharge system from each Reciprocating Pump must be equipped with a device which relieves the system of all pressures which exceed the pressure rating applied by the manufacturer to each particular piston or plunger diameter. Allowances will be made for pressure surges which are inherent with the reciprocating action of piston and plunger pumps. The percentage of pressure allowance appears later in this publication and in the "Standards of the Hydraulic Institute" (13th edition).

The relieving device must provide for instantaneous pressure relief, it may be a valve designed for automatic or manual resetting; however, if preferred, rupture discs or burst discs may be installed.

FAILURE to comply with the procedures outlined in the Warning may result in damage to the pump and related equipment and more importantly may cause serious bodily injury or death!

THE PRESSURE RELIEF VALVE:

1. This valve must be a full opening type.
2. It must have a working pressure rating, equal to or greater than, the maximum working pressure of the pump.
3. The through capacity of the valve, when fully opened, must be sufficient to relieve the full capacity of the pump without excessive overpressure.

RUPTURE DISC OR BURST DISC:

1. These discs must have a diameter which is not less than the pipe size of the pressure relief flange.
2. These discs must have a rupture or burst pressure rating consistent with the specifications tabulated later in this publication.

LOCATION OF THE RELIEF VALVE:

1. The relief valve must be placed in the discharge line as close as possible to the pump fluid end or it may be mounted on the pump discharge manifold.
2. The relief valve must be on the pump side of any discharge strainer.
3. The relief valve must be between the pump fluid end and any valve in the discharge system.
4. There must be no restricting device(s) between the relief valve and the pump fluid end.

THE RELIEF VALVE DISCHARGE LINE:

1. The relief valve discharge line should not terminate in the pump suction line.
2. The line should terminate in the supply tank, if possible.
3. The line must be securely anchored.
4. The line must be the same pipe size as, or may be larger than, the discharge connection on the relief valve.
5. If the line is of great length, this must be taken into consideration in sizing the relief valve.
6. There must be no restrictions or valves in the relief valve discharge line.

NOTE: Follow the foregoing instructions if rupture discs or burst discs are installed.

SUGGESTED SET PRESSURES FOR THE PUMP RELIEF VALVES:

PUMP TYPE:	OPERATING PUMP PRESSURE:
Double Acting – Duplex	Piston Pressure Rating – Plus 25%
Double Acting – Triplex	Piston Pressure Rating – Plus 10%
Double Acting – Quintuplex	Piston Pressure Rating – Plus 10%
Single Acting – Triplex	Piston Pressure Rating – Plus 10%
Single Acting – Simplex	Plunger Pressure Rating – Plus 25%
Single Acting – Duplex	Plunger Pressure Rating – Plus 20%
Single Acting – Triplex	Plunger Pressure Rating – Plus 10%
Single Acting – Quintuplex	Plunger Pressure Rating – Plus 10%
Single Acting – Septuplex	Plunger Pressure Rating – Plus 10%

Note: The above set pressures are to be observed when installing rupture discs or burst discs.

Foreword...

This manual is published as a guide for the normal operation of your **NATIONAL OILWELL VARCO** equipment. Because of the many factors which contribute to the function or malfunction of this machinery, and not having complete knowledge of each factor or combination of factors, we cannot detail all facets of this subject. We must therefore confine the scope of this presentation and when situations encountered are not fully encompassed by complete, understandable instructions, these situations must be referred to the manufacturer.

When other than routine servicing is necessary, it can be most efficiently performed if the unit is removed to an area of adequate space where an over-head crane, hydraulic lift, bearing pullers, impact tools, etc., are accessible.

The dimension and tolerances specified in this publication are those desirable for the most efficient operations of the equipment. When components become worn or when new parts are introduced into a worn unit, it may not be possible or economically feasible to reestablish such strict alignment and correct all dimensional deviations.

Improvements in design, engineering, materials, production methods, etc., may necessitate changes in these products and result in inconsistencies between the content of this publication and the physical equipment. We reserve the right to make these changes without incurring any liability or obligation beyond that which is stipulated in the purchase contract.

The pictures, photographs, charts, diagrams, drawings, verbal contents and specifications are not to be construed as giving rise to any warranty on the part of NATIONAL OILWELL VARCO. National Oilwell Varco makes no warranty, either expressed or implied beyond that which is stipulated in the purchase contract.

NATIONAL OILWELL VARCO pumps are manufactured by National Oilwell Varco at the McAlester, Oklahoma plant. The serial number, assigned each pump is stamped on the power end. Please refer to this serial number when ordering parts for the pump.

The right and left sides of the pump are determined by viewing the pump from the back of the power end, looking toward the fluid end. This position is also used to identify the plungers and their related parts as being number one, two and three, beginning at the left side of the pump.

⚠! CAUTION ! CAUTION ! CAUTION ! ⚠

EXERCISE SAFETY IN ALL PERFORMANCES: DO NOT IGNORE ANY WARNINGS; USE ONLY APPROVED METHODS, MATERIALS AND TOOLS. DO NOT PERMIT ANY FUNCTION OF QUESTIONABLE SAFETY; ACCIDENTS ARE CAUSED BY UNSAFE ACTS AND UNSAFE CONDITIONS. SAFETY IS YOUR BUSINESS AND YOU ARE INVOLVED.

⚠! WARNING ! WARNING ! WARNING ! ⚠

BEFORE PERFORMING ANY SERVICE FUNCTION, BE CERTAIN THAT THE UNIT IS SEPARATED FROM ITS POWER SOURCE OR THAT THE POWER SOURCE IS LOCKED-OUT TO PREVENT ANY FORM OF ENERGY FROM ENTERING THE EQUIPMENT. THIS WOULD INCLUDE ELECTRICAL OR MECHANICAL ENERGY INTO OR FROM THE PRIME MOVER(S), PNEUMATIC ENERGY FROM THE COMPRESSOR/AIR SYSTEM, ETC.

⚠! WARNING ! WARNING ! WARNING ! ⚠

FAILURE TO OBSERVE THE WARNINGS AND NOTES OF CAUTION IN THIS PUBLICATION CAN RESULT IN PROPERTY DAMAGE, SERIOUS BODILY INJURY, OR DEATH.

⚠! ATTENTION - NOTICE - IMPORTANT ! ⚠

THESE TERMS ARE USED TO DRAW ATTENTION TO ACTION THAT WILL CAUSE DAMAGE TO THE PUMP, COMPONENTS OR ATTACHMENTS.

⚠! ATTENTION ! ⚠

PUMP NOMENCLATURE:

ALL PUMP SIZES WITHIN THIS MANUAL WILL BE DESCRIBED WITH THE NEW OR CURRENT NOMENCLATURE. THE OLD 'J' MODEL PUMP NOMENCLATURES DESCRIBED ON THE FRONT COVER, BUT NOT INCLUDED IN THIS MANUAL EXCEPT AS NEEDED, ARE TO BE UNDERSTOOD AS BEING INCLUDED WITH THE NEW NOMENCLATURES.

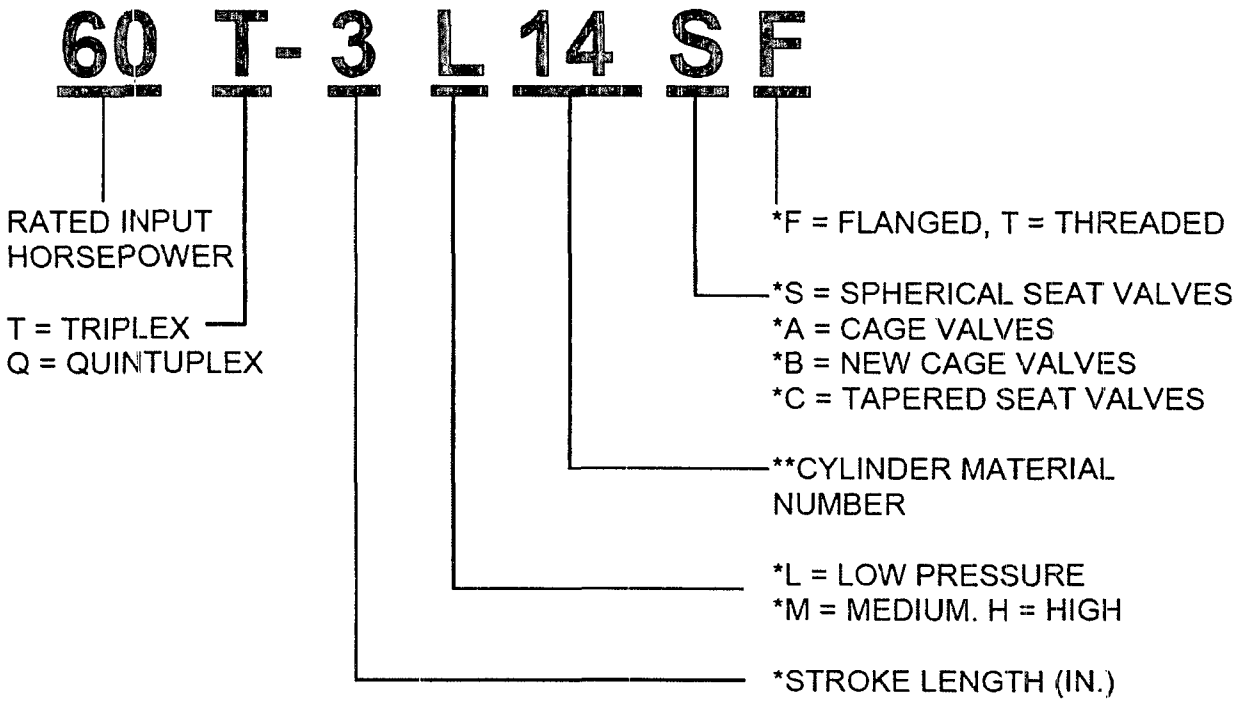
⚠! WARNING ! WARNING ! WARNING ! ⚠

BEFORE SERVICING PUMPS:

1. *SHUT DOWN OR DISENGAGE THE PUMP POWER SOURCE.*
2. SHUT DOWN ALL PUMP ACCESSORY EQUIPMENT.
3. RELIEVE OR "BLEED OFF" ALL PRESSURE FROM THE PUMP FLUID CYLINDER(S).

   FAILURE TO SHUT DOWN POWER AND RELIEVE PRESSURE FROM THE PUMP BEFORE SERVICING CAN RESULT IN SERIOUS PERSONAL INJURY AND PROPERTY DAMAGE.

Plunger Pump Nomenclature Example....



*NOMENCLATURE MAY BE SHORTENED IN PARTS LISTS OR OTHER INSTANCES TO LEAVE OFF THE MATERIAL, VALVE TYPE, ETC. THIS FULL NOMENCLATURE DESCRIPTION IS GIVEN FOR INFORMATIONAL PURPOSES.

**CYLINDER MATERIAL NUMBER EXAMPLES INCLUDE:
14 = 9D NICKEL ALUMINUM BRONZE
12 = FORGED STEEL
06 = 316 S.S.
(Inquire about other material numbers)

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OPERATION

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ASSEMBLY

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GEAR REDUCER

P-55U LUBRICATOR

STORAGE OF PUMPS

ATEX Warning Statements

I. PUMPS AND PUMP UNITS

1. Where a pump or pump unit is to be installed in a potentially explosive atmosphere ensure that this has been specified at the time of purchase and that the equipment has been supplied accordingly and displays an ATEX nameplate or is supplied with a certificate of conformity. If there is any doubt as to the suitability of the equipment please contact National Oilwell Varco before commencing with installation and commissioning.

2. Process liquids or fluids should be kept within specified temperature limits, otherwise the surface of pump or system components may become an ignition source due to temperature rises. Where the process liquid temperature is less than 90°C the maximum surface temperature will not exceed 194°F (90°C) provided the pump is installed, operated and maintained in accordance with this manual.

3. Electrical installation and maintenance work should only be carried out by suitably qualified and competent persons and must be in accordance with relevant electrical regulations.

4. All electrical equipment, including control and safety devices, should be suitably rated for the environment in to which they are installed.

5. Where there may be a risk of an accumulation of explosive gases or dust, non-sparking tools should be used for installation and maintenance.

6. To minimize the risk of sparking or temperature rises due to mechanical or electrical overload the following control and safety devices should be fitted. A control system that will shut the pump down if the motor current or temperature exceed specified limits. An isolator switch that will disconnect all electrical supply to the motor and ancillary electrical equipment and be capable of being locked in the off position. All control and safety devices should be fitted, operated and maintained in accordance with the manufacturer's instructions. All valves on the system should be open when the pump is started otherwise serious mechanical overload and failure may result.

7. It is important that the pump rotates in the direction indicated on the nameplate. This must be checked on installation and commissioning and after any maintenance has been carried out. Failure to observe this may lead to dry running or mechanical or electrical overload.

8. When fitting drives, couplings, belts, pulleys and guards to a pump or pump unit it is essential that these are correctly fitted, aligned and adjusted in accordance with the manufacturer's instructions. Failure to do so may result in sparking due to unintended mechanical contact or temperature rises due to mechanical or electrical overload or slipping of drive belts. Regular inspection of these parts must be carried out to ensure they are in good condition and replacement of any suspect part must be carried out immediately.

9. Seals should be suitably rated for the environment. The seal and any associated equipment, such as a flushing system, must be installed, operated and maintained in accordance with the manufacturer's instructions.

10. Where a packed gland seal is fitted this must be correctly fitted and adjusted. This type of seal relies on the process liquid to cool the shaft and packing rings so a constant drip of liquid from the gland section is required. Where this is undesirable an alternative seal type should be fitted.

11. Failure to operate or maintain the pump and ancillary equipment in line with the manufacturer's instructions may lead to premature and potentially dangerous failure of components. Regular inspection, and where necessary replacement, of bearings and lubrication is essential.

12. The pump and its components have been designed to ensure safe operation within the guidelines covered by legislation. Accordingly National Oilwell Varco has declared the machine safe to use for the duty specified as defined by the Declaration of Incorporation or Conformity that is issued with this instruction manual.

ATEX Warning Statements

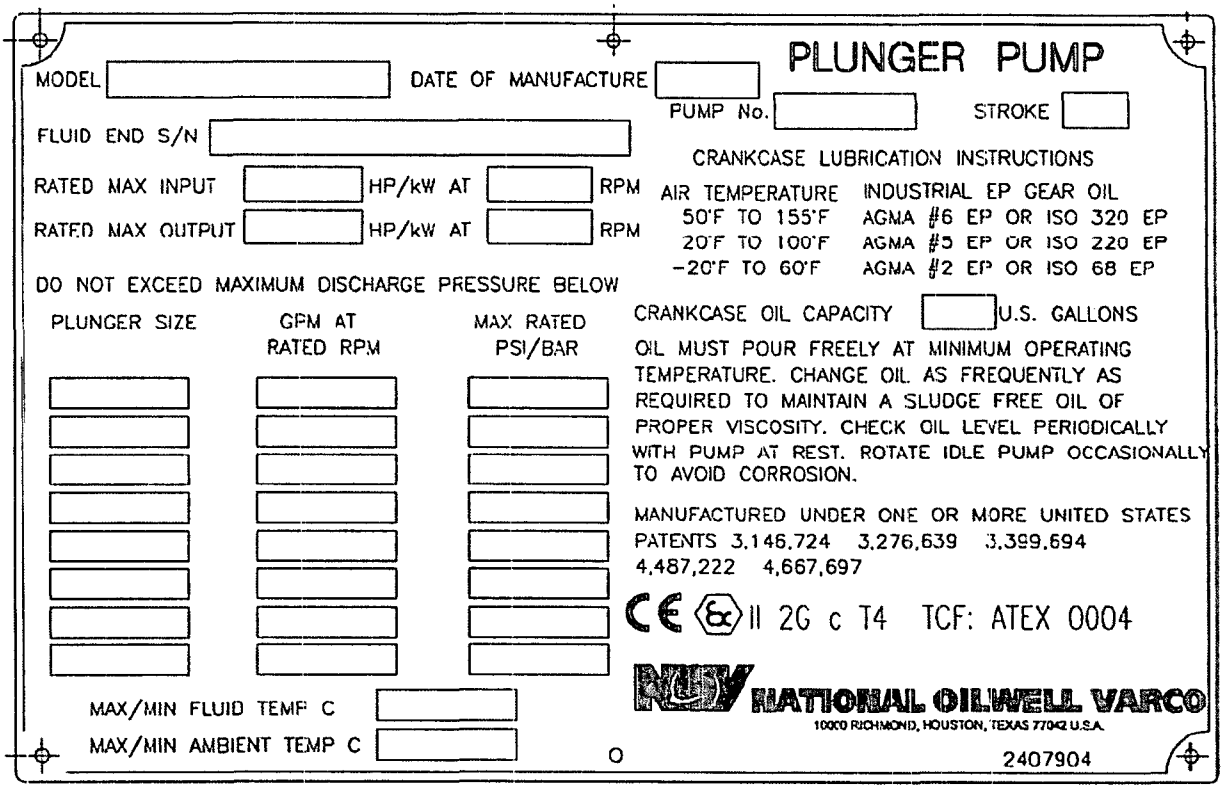
I. PUMPS AND PUMP UNITS (Continued)...

13. Failure to operate or maintain the pump and ancillary equipment in line with the manufacturer's instructions may lead to premature and potentially dangerous failure of components. Regular inspection, and where necessary replacement, of bearings and lubrication is essential.

14. The pump and its components have been designed to ensure safe operation within the guidelines covered by legislation. Accordingly National Oilwell Varco has declared the machine safe to use for the duty specified as defined by the Declaration of Incorporation or Conformity that is issued with this instruction manual.

A. 80T PUMP

1. NAMEPLATE



ATEX Warning Statements

I. PUMPS AND PUMP UNITS

A. 80T PUMP (Continued)...

2. DECLARATION OF INCORPORATION

	Declaration of Incorporation (Machinery) EC Declaration of Conformity (ATEX)	

MANUFACTURER: National Oilwell Varco
6750 S. 57th West Avenue
Tulsa, Oklahoma 74131

PRODUCT DESCRIPTION: 80T Pump

APPLICABLE EUROPEAN DIRECTIVES:

Machinery:	98/37/EC
ATEX:	94/9/EC
PED	97/23/EC

APPLICABLE HARMONIZED STANDARDS:

Machinery:	EN 12100-1, EN 12100-2
ATEX:	EN 1127-1, EN 13463-1, EN 13463-5
PED:	Exempt per Article 1, Clause 3.10

NOTIFIED BODY

Bureau Veritas, ATEX NB 0081 retains a copy of the Technical File: ATEX 0004

ATEX product marking: CE Ex II 2G c T4

The equipment described in this Declaration of Incorporation complies with the Applicable European Directives and relevant sections of the Applicable International Standards. Integration instruction are provided that contain requirements and specifications that must be implemented prior to putting this equipment into service; this equipment must not be put into service before the machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive. The EHSR's related to this equipment have been addressed; a Technical Construction File is available for inspection by designated bodies.

Authorized Signature: Date:

Chris Cackler

October 4, 2007

Important safety information is contained in the installation, operation and service manuals; read and understand this information prior to installing or using this equipment

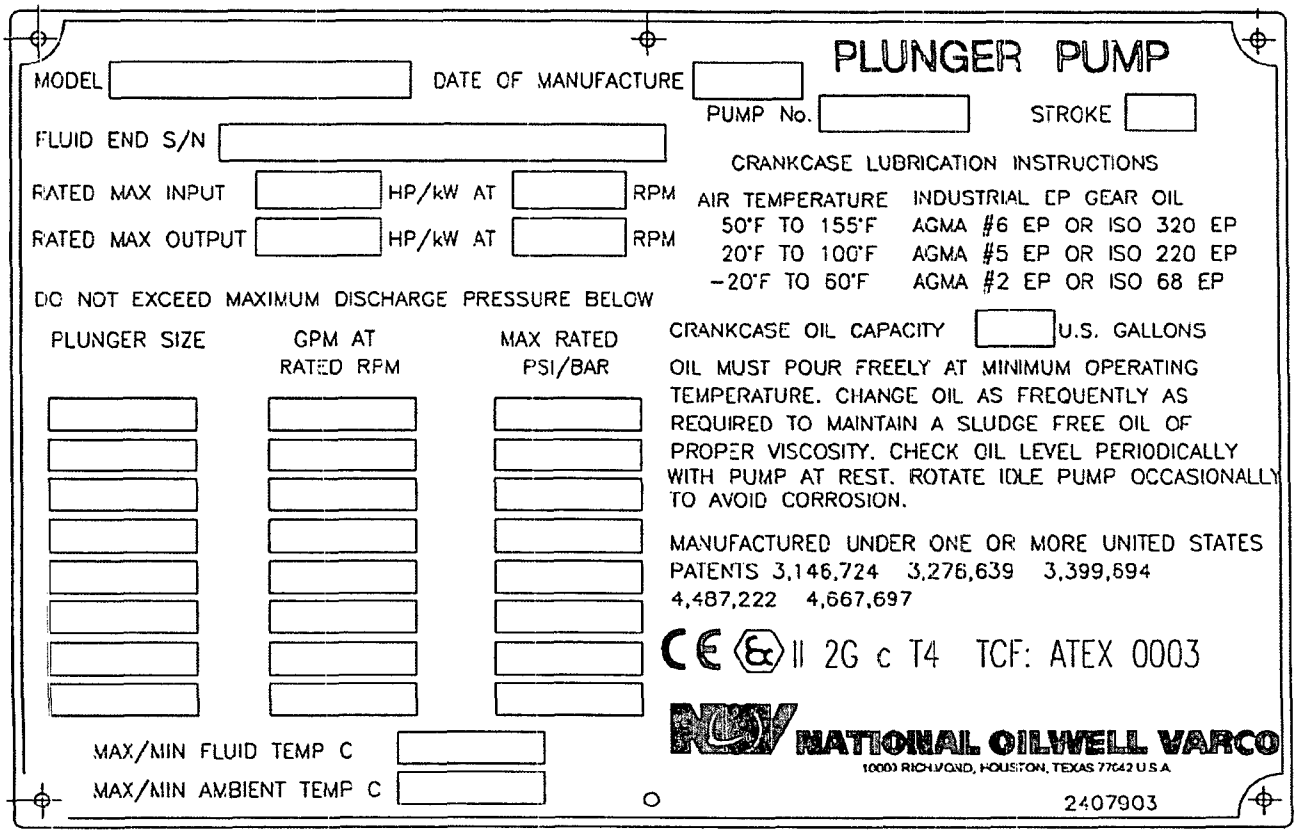
This Document applies only to the equipment described above and is invalid if not reproduced in its entirety.

ATEX Warning Statements

I. PUMPS AND PUMP UNITS (Continued)...

B. 300Q PUMP

1. NAMEPLATE



ATEX Warning Statements

I. PUMPS AND PUMP UNITS

B. 300Q PUMP (Continued)...

2. DECLARATION OF INCORPORATION

Ex	Declaration of Incorporation (Machinery) EC Declaration of Conformity (ATEX)	

MANUFACTURER: National Oilwell Varco
10000 Richmond
Houston, Texas 77042

PRODUCT DESCRIPTION: 300Q Pump

APPLICABLE EUROPEAN DIRECTIVES:

Machinery:	98/37/EC
ATEX:	94/9/EC
PED	97/23/EC

APPLICABLE HARMONIZED STANDARDS:

Machinery:	EN 12100-1, EN 12100-2
ATEX:	EN 1127-1, EN 13463-1, EN 13463-5
PED:	Exempt per Article 1, Clause 3.10

NOTIFIED BODY

Det Norske Veritas, ATEX NB 0575 retains a copy of the Technical File: ATEX 0003

ATEX product marking: CE Ex II 2G c T4

The equipment described in this Declaration of Incorporation complies with the Applicable European Directives and relevant sections of the Applicable International Standards. Integration instruction are provided that contain requirements and specifications that must be implemented prior to putting this equipment into service; this equipment must not be put into service before the machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive. The EHSR's related to this equipment have been addressed; a Technical Construction File is available for inspection by designated bodies.

Authorized Signature: Date:

March 1, 2007

Matthew Bryce

Important safety information is contained in the installation, operation and service manuals; read and understand this information prior to installing or using this equipment

This Document applies only to the equipment described above and is invalid if not reproduced in its entirety.

Installation...

I. GENERAL

Careful planning of the plant layout will save considerable time and expense, both initially when the installation is made and later during the operation of the plant. In selecting the location for the pump, consideration should be given to the fact that a positive suction head at the pump inlet contributes toward the pump efficiency. However, the layouts of the piping, the arrangement of the fittings, and restrictions in the suction and discharge lines have even more effect. For this reason, all fittings and valves should be full opening; all bends should be of long radius or should be eliminated where possible. Long radius 45° ells should be used, particularly if installed near the fluid cylinder. The following points outline the basic requirements for an installation that will contribute greatly toward good pump operation.

A. LIFTING

⚠! WARNING ! WARNING ! WARNING ! ⚠

Extreme care must be made when lifting this pump to avoid property damage, serious bodily injury, or death.

1. CHAIN SELECTION

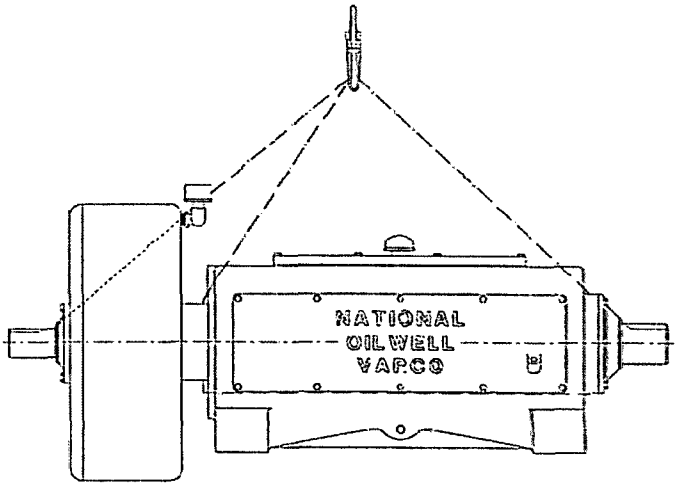
   Minimum chain specification is as follows:

   3/8" size
   31/32" pitch steel
   Rated 5000# Proof Test

Use of chain below minimum requirements can result in damage, serious bodily injury, or death.

2. CHAIN LOCATIONS

The arrangement drawings below and following indicate the proper slinging method for handling this pump with chains. Any deviation from this plan can result in damage, serious bodily injury, or death.

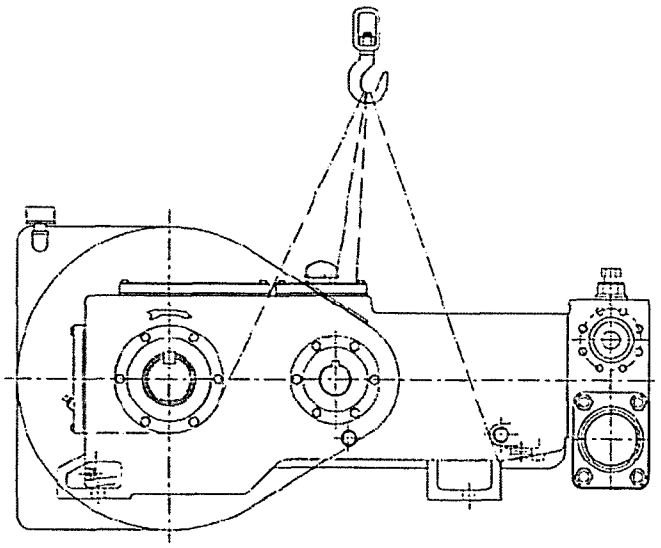


Lifting Arrangement, Rear View

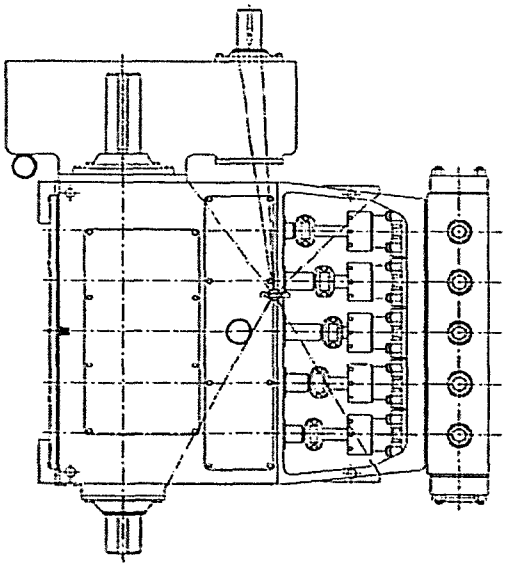
Installation...

I. GENERAL

A. LIFTING (Continued)...



Lifting Arrangement, Side View



Lifting Arrangement, Top View

Installation...

I. GENERAL (Continued)...

B. PUMP MOUNTING

1. The skid or foundation must be level. Angular installation and operation may be detrimental to the lubrication of equipment and may impose high stresses causing equipment failure.
2. The skid or foundation must be of sufficient strength to prevent flexing of the equipment.
3. The skid or foundation must be of sufficient size and design to maintain the equipment free of strain.
4. The equipment must be adequately secured to the foundation. High strength bolts or capscrews with locking devices are generally employed.
5. Consideration should be given to the location of the equipment with its proximity to the associated equipment, fluid supply, fuel supply, environmental contamination, etc.
6. Avoid environmental contamination by providing the proper disposition of drainage from the crankcase, gear case, chain case, sludge sump and any other lubrication reservoirs as well as from the flushing media sump, the pump cradle, the suction line and the discharge line.

C. ALIGNMENT

1. It is most important that the pump be accurately aligned with the prime mover.
2. Follow the recommended alignment procedures provided by the manufacturer of the belts and sheaves or couplings.

D. SUCTION LINE

1. The suction line must not be smaller than the suction intake of the fluid cylinder and may be larger. The length of the suction line should be held to a minimum and should run straight from the supply tank to the pump.
2. When bends are required, they should be made with long radius 45° ells. Do not use a bend directly adjacent to the fluid cylinder. Avoid using any 90° bends if at all possible.
3. Provide a full opening gate valve in the suction line adjacent to the supply tank to permit the line to be drained when necessary. Do not use any type of restricting valve.
4. Do not use meters or other restrictions in the suction line. Eliminate any rise or summit in the suction line where air or vapor can collect.
5. Pulsation dampening devices are strongly recommended.
6. When necessary to manifold a number of pumps to a common suction, the diameter of the manifold and suction pipe leading from the supply tank must be such that it has a cross-sectional area equal to, or greater, than the area of the combined individual suction pipes.
7. When a charging or booster pump is used in the suction line, it must have a capacity equal to twice that of the pump output. This is necessary to provide a charging pump with an output great enough to meet the peak volume requirements of the plunger pump during the suction stroke and not act as a restriction in the line.
8. All piping, both suction and discharge must be solidly and independently supported. The first support must be as close to the pump as practical. This is necessary to prevent placing the pump in a strain and to keep any vibration in the system from acting directly on the pump.

Installation...

I. GENERAL (Continued)...

E. DISCHARGE LINE

1. Use a pulsation dampener or a desurger in the discharge line. It should be placed in the line as near the fluid cylinder as possible and ahead of any bend in the line.

2. Do not reduce the size of the discharge line below that of the pump outlet until the line has passed through the desurger, and is away from the pump approximately 20 feet (6m).

3. Any bend in the discharge line should be made with a long radius 45° ell. Do not use a bend directly adjacent to the fluid cylinder, particularly a 90° bend.

4. A pressure relief valve should be installed in the discharge line. The relief valve should be set to operate at a pressure no greater than 25% above the maximum rated pressure for the plunger size being used. It should be installed in the line ahead of any valve and be piped so that any flow is returned to the supply tank rather than the suction line. This will prevent possible damage to the suction line and suction dampener.

5. A by-pass line should be installed to permit the pump to be started without load. This allows oil to circulate and reach all parts in the power end before they are loaded.

F. POWER END

1. The pump must be mounted level and should be grouted in and be free of strain. This applies to a skid-mounted pump or a pump mounted directly on a concrete base.

2. The sheave of a belt driven pump must be correctly aligned with the prime mover sheave. Care must be used to prevent over-tightening as this will shorten belt life, place the pump in a strain, and cause undue additional loads on the crankshaft and bearings. Sheave sizes should not be smaller than the minimum approved diameter.

3. When connecting a direct-driven pump, the shafts must be correctly aligned. Couplings should not be expected to compensate for avoidable misalignment. With Thomas Flexible Couplings, angular misalignment should not exceed one-half degree. Offset misalignment of the centerlines of the two shafts should not exceed .015" (.381 mm). Actually, misalignment should be as small as practical.

4. Provision should be made to stop the pump automatically in the event of supply fluid failure. A pump should not be run dry, as this causes wear on the packing.

5. Adequate plunger chamber drains have been provided in the pump and should not be plugged. Drain lines should never be reduced in size from the connection provided.

6. The pump has been drained of oil after testing at the factory and **MUST** be filled with the proper oil (see page 26) before starting. The rust inhibiting oil coating inside the power end need not be removed before filling; however, it is recommended that the power end be checked to make sure dirt or contamination has not entered during shipment.

Installation...

I. GENERAL (Continued)...

G. FLUID END

1. The fluid cylinder is shipped assembled to the pump complete with valves and cover plates. The stuffing boxes, plungers, and related items have also been assembled and tested with the pump (unless otherwise specified) and require no further assembly. Before the pump is started, these parts should be checked for tightness as well as for possible damage during shipment.

2. Thoroughly clean the suction line piping before starting the pump. Weld spatter, slag, mill scale, etc., will damage a pump in a short time.

H. PLUNGER PACKING

The recommended style of packing has been installed and run at the plant. It does, however, require further "setting up" as the pump is started and brought up to pressure. Refer to pages 49 through 52 for correct procedure for packing used.

I. PLUNGER PACKING LUBRICATION

1. Automatic packing lubricators are beneficial on all installations and are required on pumps operating at high pressure (1200 psi [85kg/cm 2] and up) to obtain good packing life.

2. When an automatic lubricator is used in water and power oil service, use Rock Drill (Air Drill) oil of proper viscosity. For butane-propane service, use NATURAL castor oil. Set lubricator to feed 5 to 7 drops per minute.

J. SUCTION PULSATION DAMPENERS

1. Low Pressure - Plastic Body

a. Some National Oilwell Varco plunger pumps are equipped with suction pulsation dampeners. These dampeners do an excellent job when properly charged and should be kept filled during operation.

⚠! ATTENTION ! ⚠

At suction pressures over 10 psi (.7kg/cm2), the dampener should be deflated prior to bleeding off the suction pressure to prevent damage to the diaphragm.

b. The plastic dampener body has an instruction decal attached, which lists the following installation and charging procedures.

⚠! ATTENTION ! ⚠

HANDLE WITH CARE.
This is a plastic part and can be broken.

c. Tighten capscrews with 10 to 12ft-lbs. of torque.

Installation...

I. GENERAL

J. SUCTION PULSATION DAMPENERS

1. Low Pressure - Plastic Body (Continued)...

! ATTENTION !

Use thread sealing compound on check valve and tighten until snug.
OVERTIGHTENING WILL DAMAGE BODY.

d. With pump operating - Charge dampener until bottom of diaphragm is visible through sight glass. Proper charge is when bottom of diaphragm is between center and top of sight glass.

2. High Pressure - Aluminum Body

a. In pressures in excess of 20 psi (1.406 kg/cm2) and up to 70 psi (10.545 kg/cm2), it is necessary to use the National Oilwell Varco high-pressure suction dampener.

b. The high-pressure dampener is charged in a similar manner to the low-pressure plastic dampener, using air or nitrogen to charge the diaphragm and maintain its position in relation to the sight glass.

c. The following procedures should be used to service this dampener:

(1) The dampener is fitted to an adapter that may be either welded into an existing line or be a part of a separate dampener housing. Place a gasket on each side of the diaphragm retaining plate and place on the adapter.

(2) The dampener spacer is then placed on top of the retainer plate with the grooved side up and the flat side against the retainer gasket.

(3) The diaphragm fits into the groove on the spacer with the curved portion of the diaphragm above the spacer.

(4) Apply a continuous 1/8" diameter bead of silicone rubber on the outer edge of the diaphragm after it has been positioned into the spacer. This silicone rubber (GE Silicone Rubber or Dow-Corning Silastic) is readily available at most hardware stores. Assemble the body cover within ten minutes after applying the silicone rubber.

(5) Fit the dampener cover over the diaphragm and assemble the capscrews. Tighten these capscrews evenly to approximate 80 ft-lbs. of torque.

(6) Install the sight glasses, one in each side of the cover. Be sure to seat the sight glass packing carefully into the groove on the cover, as this must be an airtight connection.

(7) The air check valve has a pipe thread and must be made up into the cover airtight. Use a good pipe thread sealant to promote sealing.

Lubrication...

I. GENERAL

NATIONAL OILWELL VARCO Plunger Pumps are "splash" lubricated. The main bearings receive oil through ports in the frame. Crankshaft bearings are fed by splash and at low speed through roll pins from the crosshead reservoir. Crossheads and crosshead pin bushings are fed through holes in the crossheads and crosshead reservoir. Intermediate rods are lubricated from the splash they receive from the crosshead. At speeds under 200 rpm, special auxiliary oil systems are required except on the 300Q Initial filling should be into the crosshead reservoir on top of the crossheads.

A. OIL

Use "extreme pressure" gear oil. The chart below shows the recommended grades for various temperatures surrounding the pump.

U.S. UNITS OF MEASURE	
Temperature	**AGMA Industrial EP Gear Oil**
+50°F to +155°F	AGMA No. 6 EP or ASTM/ISO Grade No. 320 (viscosity 1335 to 1632 SSU 100°F)
+20°F to +100°F	AGMA No. 5 EP or ASTM/ISO Grade No. 220 (viscosity 918 to 1122 SSU 100°F)
-20°F to + 60°F	AGMA No. 2 EP or ASTM/ISO Grade No. 68 (viscosity 284 to 347 SSU 100°F)

Crankcase Capacity - U.S. Gallons:			
	30T - 1-1/2	100T - 5-1/2	200T - 8
	60T - 2	130T - 5-1/2	250T - 8
	80T - 2	165T - 8	300Q - 12

METRIC UNITS OF MEASURE	
Temperature	**AGMA Industrial Gear Oil**
+10°C to +68°C	AGMA No. 6 EP or ASTM/ISO Grade No. 320 (Viscosity 228-352 cSt at 37.8°C)
-7°C to +38°C	AGMA No. 5 EP or ASTM/ISO Grade No. 220 (Viscosity 198-242 cSt at 37.8°C)
-29°C to +16°C	AGMA No. 2 EP or ASTM/ISO Grade No. 68 (Viscosity 61-75 cSt at 37.8°C)

Crankcase Capacity - Liters:			
	30T - 5.7	100T - 20.8	200T - 30.3
	60T - 7.6	130T - 20.8	250T - 30.3
	80T - 7.6	165T - 30.3	300Q - 45.4

Oil must pour freely at minimum operating temperature. Change oil every six months or as frequently as operating conditions require to maintain a clean, sludge-free oil of proper viscosity.

Operation...

I. GENERAL

⚠! ATTENTION ! ⚠

THE FOLLOWING POINTS SHOULD BE CHECKED FOR THE PREVENTION OF TROUBLE OR TO CORRECT TROUBLE THAT MAY ARISE.

A. OPERATION CHECKLIST

1. Pump must be a set level for proper lubrication. If an auxiliary lubrication pump is used for slow speed operation, make sure it is connected and is operating properly.
2. Make sure pump is filled with clean oil of the proper viscosity (see above).
3. Do not over-speed the pump.
4. Do not use a smaller diameter sheave than is recommended for the pump.
5. Make sure all safety shutdown switches are operating properly.
6. Keep all suction and discharge line valves fully open.
7. If a bypass is used to regulate output, make sure it is set properly.
8. Make sure the pressure relief valve is set properly.
9. Do not exceed the pressure rating of the pump for the particular plunger size.
10. Make sure the suction line is tight as air entering the suction line will cause severe hammering and knocking of the pump.
11. Make sure plunger and intermediate rod connections are tight and locked.
12. Check the plunger packing for correct adjustment (see pages 49 to 52).
13. Check the suction and discharge dampeners for proper charge as this is very important for long dampener life and good pump operation.
14. Make sure the hex nuts holding the cylinder in place are tight.

Maintenance...

I. GENERAL

The following points are intended as a guide to be used in setting up a maintenance program. Good preventive maintenance will pay big dividends in the form of reliable service with a minimum of trouble.

A. DAILY MAINTENANCE

1. Check power end oil level daily by means of the dipstick in the rear cover. Do not attempt to check the oil with the pump running. Inspect the oil for dirt or contamination and change if necessary. An increase in oil level indicates fluid end leakage into power end. Change oil immediately and check intermediate rod wipers and surface smoothness of rod. Check for plunger packing leakage.

2. Lubricate plunger packing frequently. Packing life can be greatly increased by greasing every four (4) hours with a small amount of grease. Grease is not recommended at pressures above 1200 psi. Use an alternate packing lubricator to drip the proper oil of the plunger for lubrication. (See page 26 for further details).

3. Check lubricator for proper level and operation.

4. Check plunger packing for excessive leakage. Replace packing as required.

5. Check stuffing box adjusting nuts for tightness.

6. Drain plunger leakage sump tanks if required.

7. Flush plunger chamber drain lines with kerosene on power oil pumps and fresh water on salt pumps. This may be done weekly unless salt and paraffin accumulation is severe.

8. Make sure suction and discharge line valves are fully open.

9. Check for leakage between the fluid cylinder and frame or stuffing box to fluid cylinder packing if required.

10. Check all seals for leakage.

11. Check belts or clutch for slippage. If either condition exists, correct immediately.

B. MONTHLY MAINTENANCE

1. Drain and refill crankcase every six (6) months or as often as required to maintain a clean, sludge-free oil of the proper viscosity.

2. Clean crankcase air breather with a non-explosive solvent.

3. Check all studs, nuts and capscrews for tightness. Inspect gaskets for leaks; tighten or replace as required.

4. Clean pump. Good housekeeping is a prerequisite to good maintenance.

Maintenance...

I. GENERAL (Continued)...

C. STORAGE

If the pump is to be idle for longer than one (1) week, it should be prepared for storage as follows:

1. Drain and clean crankcase thoroughly. Leave drain open and install 90° elbow, pointing downward, to permit air circulation and prevent condensation build-up.
2. Coat all bearings, finished surfaces, and entire inside surface of crankcase with a rust inhibiting oil.
3. Remove plungers and packing, clean and coat with rust inhibiting oil.
4. Remove fluid cylinder valves allowing cylinder to be thoroughly cleaned and drained.
5. Coat entire cylinder, valves and parts, with a rust inhibiting oil.
6. Thoroughly inspect pump and rotate crankcase once each month. Re-coat with rust inhibiting oil where necessary.

D. START-UP AFTER STORAGE

Any pump that has been in storage, either after field use or as shipped from the plant, will need a thorough inspection to make sure it has not been damaged in any way and that all parts are properly in place.

⚠! ATTENTION ! ⚠

FAILURE TO OBSERVE THE FOLLOWING POINTS CAN RESULT IN SERIOUS DAMAGE.

1. Remove all covers on both power end and fluid end; thoroughly clean and inspect all parts and finished surfaces.
2. Check all bearings to make sure they are clean and in good condition.
3. Make sure valves, plungers and packing are properly installed and in good condition.
4. Carefully tighten all bolts, nuts, studs and working connections.
5. Fill power end to the proper level with clean oil of the proper viscosity. Make sure oil is poured into the crosshead reservoir and is worked into all bearings.
6. Fill packing lubricator and pump lines full. Check by breaking connection at stuffing box, working lubricator plunger until oil appears.

Maintenance (Continued)...

II. TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	CORRECTION
KNOCKING OR POUNDING IN FLUID END AND PIPING	SUCTION LINE RESTRICTED BY: (1, 2, 3, 4)	
	1. TRASH, SCALE BUILD UP, ETC.	LOCATE AND REMOVE
	2. PARTIALLY CLOSED VALVE IN SUCTION LINE	LOCATE AND CORRECT
	3. METERS, FILTERS, CHECK VALVES, NON-FULL-OPENING, CUT-OFF VALVE OR OTHER RESTRICTIONS.	RE-WORK SUCTION LINE TO ELIMINATE
	4. SHARP 90° BENDS OR 90° BLIND TEES.	RE-WORK SUCTION LINE TO ELIMINATE.
	AIR ENTERING SUCTION LINE THROUGH CUT-OFF VALVE	TIGHTEN OR REPACK VALVE STEM PACKING
	AIR ENTERING SUCTION LINE THROUGH LOOSE CONNECTION OR FAULTY PIPE	LOCATE AND CORRECT
	AIR OR VAPOR TRAPPED IN SUCTION LINE	LOCATE RISE OR TRAP AND CORRECT BY STRAIGHTENING LINE, PROVIDING ENOUGH SLOPE TO PERMIT ESCAPE AND PREVENT BUILD-UP
	LOW FLUID LEVEL	INCREASE SUPPLY AND INSTALL AUTOMATIC LOW LEVEL SHUT-DOWN SWITCH
	SUCTION DAMPENER NOT OPERATING	INSPECT AND REPAIR AS REQUIRED
	WORN VALVES	INSPECT AND REPAIR AS REQUIRED
	ENTRAINED GAS IN FLUID	PROVIDE GAS BOOT OR SCRUBBER FOR FLUID
	POOR INLET AND OUTLET ARRANGEMENT AT SUPPLY TANK	INLET TO BE AT TOP OF TANK AND BAFFLED TO BREAK-OUT GAS AND PREVENT CHANNELING. OUTLET TO BE 12" FROM BOTTOM OF TANK AND AS FAR FROM INLET AS POSSIBLE, NEVER CLOSER THAN 90°.
	LOOSE PACKING ADJUSTING NUT	TIGHTEN AND/OR REPLACE PACKING
	INADEQUATE SIZED SUCTION LINE	REPLACE WITH INDIVIDUAL SUCTION LINE OF NEXT SIZE LARGER THAN INLET PUMP
	LEAKAGE PRESSURE RELIEF VALVE THAT HAS BEEN PIPED BACK INTO SUCTION LINE	REPAIR VALVE AND RE-WORK PIPING TO RETURN TO SUPPLY TANK - NOT SUCTION LINE.
	BY-PASS PIPED BACK TO SUCTION	REWORK TO RETURN BY-PASSED FLUID BACK TO SUPPLY TANK - NOT SUPPLY LINE
	BROKEN PLUNGER	INSPECT WHEN ROTATING PUMP BY HAND AND REPLACE AS REQUIRED

Maintenance...

II. TROUBLE SHOOTING GUIDE (Continued)...

PROBLEM	POSSIBLE CAUSE	CORRECTION
KNOCK IN POWER END	VALVE WEAR OR DAMAGE	CHECK FLUID END FOR BAD VALVES
	WORN MAIN BEARINGS	REPLACE AS REQUIRED
	LOOSE PLUNGER - INTERMEDIATE ROD CROSSHEAD CONNECTION	INSPECT FOR DAMAGE - REPLACE AS REQUIRED AND TIGHTEN
	WORN CROSSHEAD PIN, OR CONNECTING ROD	LOCATE AND REPLACE AS REQUIRED
RAPID VALVE WEAR OR FAILURE	CORROSION	TREAT FLUID AS REQUIRED
	ABRASIVES IN FLUID	FILTER AS REQUIRED
	IMPROPER INSTALLATION	INSPECT AND INSTALL PER INSTRUCTION SHEET IN PACKING BOX
	IMPROPER LUBRICATION (EITHER INSUFFICIENT OR EXCESSIVE OR INCORRECT TYPE)	CHECK INSTRUCTIONS IN MANUAL AND CORRECT AS REQUIRED.
	LUBRICATOR NOT OPERATING	INSPECT AND CORRECT AS REQUIRED
	ADJUSTING NUT LOOSE	INSPECT AND REPACK PER INSTRUCTIONS
	SCALE OR BUILD UP ON PLUNGER	TREAT FLUID AS REQUIRED
SHORT PACKING LIFE	WORN OR PITTED PLUNGERS AND/OR STUFFING BOX	REPLACE AS REQUIRED
	ABRASIVES IN FLUID	FILTER AS REQUIRED
	PUMP OPERATED WITHOUT FLUID	CHECK SYSTEM FOR FAULTY LOW-LEVEL SHUT-DOWN CONTROLS OR CLOSED VALVES AND CORRECT AS REQUIRED.
	ABNORMALLY HIGH FLUID TEMPERATURES	CHECK WITH MANUFACTURER FOR RECOMMENDATIONS ON TYPE OF PACKING
	WRONG TYPE OF PACKING FOR PARTICULAR FLUID BEING HANDLED	CHECK WITH MANUFACTURER FOR RECOMMENDATIONS ON TYPE OF PACKING
	CAVITATION (KNOCKING AND POUNDING IN FLUID CYLINDER AND PIPING)	REFER TO CORRECTION OF "KNOCK IN POWER END" ABOVE

Maintenance...

II. TROUBLE SHOOTING GUIDE (Continued)...

PROBLEM	POSSIBLE CAUSE	CORRECTION
BROKEN OR PITTED FROM IMPLOSIONS CAUSED BY IN EXCESSIVE GAS OR AIR ENTRAINED FLUID.	PLUNGER CRACKED AT INSTALLATION.	INSTALL NEW PLUNGER USING CARE TO AVOID ANY SHARP BLOW OR FORCE ON PLUNGER.
	PLUNGER CRACKED FROM THERMAL SHOCK.	CHECK SYSTEM TO ELIMINATE ANY SHARP OR SUDDEN TEMPERATURE DIFFERENCES. TEMPERATURE EXTREMES ON THE PLUNGER CAN OCCUR FROM PACKING AS DISCUSSED UNDER "SHORT PACKING LIFE" PROBLEM PR FROM TEMPERATURE CHANGES IN THE FLUID ITSELF.
	PLUNGER PITTED FROM IMPLOSIONS CAUSED BNY EXCESSIVE GAS OR AIR ENTRAINED IN FLUID.	CHANGE SUCTION SYSTEM TO ELIMINATE OR CHECK WITH MANUF. REGARDING USE OF SPECIAL PACKING ARRANGEMENT.
RAPID WEAR OF HARD-COATED PLUNGER	PACKING FAILURE.	CHECK AND CORRECT PER RECOMMENDATIONS UNDER "SHORT PACKING LIFE" PROBLEM.
	PLUNGER NOT SUITABLE FOR PARTICULAR SERVICE.	CHECK WITH MANUF. FOR RECOMMENDATION.
OIL SEAL LEAKS	PLUNGER NOT SUITABLE FOR PARTICULAR SERVICE.	CHECK AND CORRECT AS REQUIRED.
	PUMP NOT LEVEL.	CHECK AND CORRECT AS REQUIRED.
	WORN, CORRODED, PITTED, OR OTHERWISE DAMAGED SEALING SURFACE.	CHECK AND CORRECT AS REQUIRED.
	WORN OR DAMAGED SEALS.	CHECK AND CORRECT AS REQUIRED.
	OIL LEVEL TOO HIGH.	CHECK AND CORRECT AS REQUIRED.

Overhaul and Repair...

I. GENERAL

The bearings and other working parts in the power end have been designed for continuous duty, and if properly lubricated, will provide years of trouble-free service. However, after the pump has been in service for a long period of time, the bearings and other working parts will gradually loosen, and if not corrected, will lead to more serious trouble. The time to overhaul the pump will vary, depending on the operating conditions, and is therefore a matter that must be left to the good judgment of the operator. Complete disassembly and assembly procedures are discussed in their respective sections.

A. TOOLS REQUIRED

Most of the tools required to overhaul the pump will be found in an ordinary set of mechanics hand tools. The special tools and equipment required and not furnished with the pump include a torque wrench, bearing puller, and a valve servicing kit. Also, a hot oil bath capable of reaching a temperature of 300° F (149° C) will be needed.

B. CHECK POINTS AND ADJUSTMENTS

1. 30T, 60T & 80T:

   The crankshaft main bearings are single row, shim adjusted, tapered roller bearings. They have been assembled and adjusted at the factory with proper clearance and will give long trouble-free service. The proper clearance is found by adjusting the amount of shims until the crankshaft has .003" to .005" endplay and will rotate freely.

2. 100T, 130T, 165T, 200T, 250T & 300Q:

   a. The crankshaft main bearings are non-adjustable, double row tapered roller bearings, factory set for the proper running clearance.

   b. The connecting rods, or bearing inserts, are solid aluminum alloy precision ground with the following tolerances -- page 28.

   c. The minimum allowable clearance between the crosshead and crosshead bore is .012" (.305 mm). The maximum allowable clearance, including wear, is .030" (.762 mm). This is for all pumps.

   d. Maximum allowable clearances between the crosshead pin and connecting rod bushings are listed on page 28. The bushings are pressed into the connecting rod and must be reamed to size. The pin and bushings must then be "blued" to check the fit. High spots in the bushings must be scraped.

Overhaul and Repair...

I. GENERAL

B. CHECK POINTS AND ADJUSTMENTS (Continued)...

PUMP	CRANKSHAFT O.D		MAXIMUM CLEARANCE		MINIMUM CLEARANCE	
	in	mm	in	mm	in	mm
30T	2.500 2.499	63.500 63.475	.012	.305	.003	.076
60T 80T	3.250 3.249	82.550 82.525	.013	.330	.003	.076
100T 130T	4.125 4.124	104.775 104.750	.018	.457	.007	.178
165T 250T 200T 300Q	5.000 4.999	127.000 126.975	.020	.508	.0064	.163

PUMP	CROSSHEAD PIN O.D.		MAXIMUM CLEARANCE		MINIMUM CLEARANCE	
	in	mm	in	mm	in	mm
30T	1.3765 1.3760	34.963 34.950	.007	.178	.001	.025
60T 80T	1.8765 1.8760	47.663 47.650	.007	.178	.0015	.038
100T 130T	2.5635 2.5630	65.113 65.100	.007	.178	.0015	.038
165T 200T 250T 300Q	3.0015 3.0010	76.238 76.225	.008	.203	.002	.051

Disassembly...

I. POWER END

It is not necessary to remove the fluid end when disassembling the power end. The plungers may be disconnected from the intermediate rods and left in the stuffing boxes.

A. INTERMEDIATE RODS AND OIL WIPER RETAINERS (ALL PUMPS)

1. Loosen the plunger lock screws (if used), disconnect the plunger from the intermediate rod, and remove the baffle plate.

⚠! ATTENTION ! ⚠

A BACK-UP WRENCH MUST BE USED FOR REMOVAL OF PLUNGER AND INTERMEDIATE ROD TO PREVENT DAMAGE TO THE CONNECTING ROD.

2. The oil wiper retainer is piloted into the frame and held in place by two capscrews or a metal clip.

3. Remove the intermediate rod from crosshead lock screw (if used), and using a back-up wrench on the crosshead, unscrew the rod. Remove the rod and oil wiper retainer as one assembly.

B. CRANKSHAFT ASSEMBLY

- **J-30 Prior to S/N 3854**
- **J-60 Prior to S/N 7476**

1. Remove connecting rod bolts and cap.

   NOTE: Match marks and deep halves together.

2. Connecting rod and crosshead must be moved all the way forward to clear crankshaft.

3. Remove crankshaft bearing retainers and seals, and shims. These shims should be tied together and marked for reassembly at their original location.

Disassembly...

I. POWER END

B. CRANKSHAFT ASSEMBLY (Continued)...

! ATTENTION !

COVER KEYWAYS TO PROTECT OIL SEALS DURING REMOVAL.

4. Rotate No. 1 throw to front, support the crankshaft, and remove it from either side, tapping it out with a brass bar to prevent damage to the end. This will automatically remove one of the main bearing outer races. The other race may be removed by knocking it out with a brass bar. Tag the outer bearing races so they may be reassembled with the same bearing cone and roller assembly.

• 30T, 60T, and 80T

1. Remove connecting rod bearing cup and both inserts.

   NOTE: Match marks on rod and cap and keep halves of inserts together.

2. Connecting rod and crosshead can be removed through cradle chamber without disturbing the crankshaft. Interference with plungers and stuffing box nuts is possible depending on plunger size. Remove plungers if necessary.

3. Remove crankshaft bearing oil seal retainers and gasket.

4. Use puller screws in crankshaft bearing cage "back-out" holes, if necessary, and remove crankshaft assembly with main bearing cage from the left side of the pump. During removal have No.1 throw on crankshaft forward.

• J-100 Prior to S/N 9568 and J-150

1. Remove all the connecting rod bearing caps and both inserts. Keep halves inserted together.

2. Connecting rod and crosshead must be moved all the way forward with intermediate rods removed, to clear crankshaft.

3. Remove crankshaft bearing oil seal retainers and gasket.

4. Use puller screws in crankshaft bearing cage "back-out" holes, if necessary, and remove crankshaft assembly with main bearing cage from the left side of the pump. During removal have No.1 throw on crankshaft forward.

Disassembly...

I. POWER END

B. CRANKSHAFT ASSEMBLY (Continued)...

• 100T, 130T, 165T, 200T, 250T and 300Q

1. Remove connecting rod bearing cap and both inserts. Keep halves of inserts together.
2. Connecting rod and crosshead can be removed through cradle chamber without disturbing the crankshaft. Interference with plungers and stuffing boxes is possible depending on plunger size. Remove stuffing boxes if necessary.
3. Remove oil wiper troughs. (200T, 250T and 300Q)
4. Remove right hand bearing retainer and gasket.
5. Remove left hand bearing retainer and gasket and remove capscrews from bearing cage.
6. Crankshaft can be removed from left side of pump only. Puller holes are provided in the bearing cage if needed. Extreme care should be used in removing the crankshaft so as not to damage the center support bearings or the bearing journals on the crankshaft of the 300Q.

C. CRANKSHAFT BEARINGS - ALL PUMPS

The crankshaft main bearings may be inspected while on the crankshaft and should not be removed unless necessary. A puller is required when replacement is necessary.

NOTE: Keep the component parts of the bearings together if they are to be re-installed. They are match marked and must be correctly assembled as a unit.

Disassembly (Continued)...

II. FLUID END

A. FLUID CYLINDER REMOVAL

•30T, 60T and 80T

1. Disconnect piping.
2. Remove the eight (8) fluid cylinder hex nuts and slide cylinder forward over the main frame studs.

• 100T, 130T, 165T, 200T, 250T and 300Q

1. Fluid cylinders can be removed without disturbing the stuffing boxes or plungers. But it is recommended that the stuffing boxes and plungers be removed for easier access to the lower cylinder studs and nuts.
2. Disconnect piping.
3. Remove nuts holding stuffing box retainer in place.
4. Slide retainer clear of the cylinder studs.
5. Remove fluid cylinder retaining socket head capscrews.

B. STUFFING BOXES AND PLUNGER REMOVAL

• 30T, 60T and 80T

1. Rotate crankshaft until the intermediate rod is in the back position of its stroke. Loosen the plunger lock screw (if used), and disconnect the plunger from the intermediate rod.

! ATTENTION !

USE BACK-UP WRENCH ON THE CROSSHEAD TO PREVENT DAMAGE TO CONNECTING ROD.

2. Slide the plunger forward in the stuffing box. Unscrew the intermediate rod. Remove the clip holding the intermediate rod wiper retainer; remove the rod and retainer as one assembly.
3. The plunger can now be slid back out of the stuffing box and removed through the cradle chamber.
4. Remove stuffing box nut and packing.
5. For removal of the stuffing box, the fluid cylinder must be first removed.

Disassembly...

II. FLUID END

B. STUFFING BOXES AND PLUNGER REMOVAL (Continued)...

• 100T, 130T, 165T, 200T, 250T and 300Q

1. Rotate the crankshaft until the intermediate rod is all the way forward (at the end of the discharge stroke). Remove the intermediate rod to crosshead lock screw, remove the plunger clamp assembly, and brake the intermediate rod loose from the crosshead one-fourth (1/4) turn.

! ATTENTION !

A BACK-UP WRENCH MUST BE USED ON THE CROSSHEAD.

2. With the intermediate rod in the forward position, slide the plunger forward in the stuffing box.
3. Rotate the crankshaft until the intermediate rod is in the back position of its stroke. Unscrew at the intermediate rod and the intermediate rod wiper retainer capscrews then remove the rod and retainer as one assembly.
4. The plunger can now be slid back out of the stuffing box and removed through the cradle chamber.
5. Remove the stuffing box nut, lube fitting (copper tubing if lubricator is used), and packing.

C. FLUID END VALVE REMOVAL

Refer to valve section located in the middle of this manual.

Assembly...

I. POWER END

A. CRANKSHAFT AND MAIN BEARINGS

• 30T, 60T, and 80T

1. Thoroughly clean and remove all burrs from the I.D. of the cone and roller assembly and from the bearing seating surfaces on the crankshaft.

2. Heat the cone and roller assembly in an electric oven or oil bath to 300°F (149°C). It is recommended that a thermometer be used to prevent overheating.

3. After the bearings have been brought up to temperature and with the crankshaft firmly supported, install the cone and roller assemblies on the crankshaft. The large O.D. must go on first and be positioned next to the shoulder on the crankshaft. *Make sure the cone and roller assemblies are firmly against the shoulders on the crankshaft.*

4. Allow the crankshaft and bearing assembly to cool before installing in the power end.

5. Make sure the main bearing openings in the frame are clean and free of burrs.

   NOTE: The crossheads and connecting rods on old J-30 pumps prior to S/N 3854 and J-60 pumps prior to S/N 7476 must be installed prior to replacing the crankshaft assembly.

6. With the cone and roller assemblies of the main bearings in place on the crankshaft, slide the crankshaft from either side through the main bearing openings in the power end frame with No. 1 throw forward.

7. Install the crankshaft main bearing outer races or cups; the thin edge of the tapered race leading into the bore over the cone and roller assembly.

8. Place the crankcase main bearing shims, amounting to approximately .050" (1.27 mm) in thickness, on either crankshaft bearing retainer. *If the old bearings and retainers are being re-installed, use the same amount of shims as before.*

   NOTE: The following steps (9, 10a and 10b) are necessary only if new bearings are being installed. When the same crankshaft main bearings are being reassembled, use the same amount of shims as were previously used and use the steps as a check for adjustment.

9. Assemble the crankshaft bearing retainer and shims (less oil seal) to the main frame and tighten in place with the proper capscrews.

10. Install the other crankshaft bearing retainer (less oil seal) in the same manner as in step nine (9) above. To determine the correct amount of shims when installing new bearings, the following steps are recommended.

    a. When first installing shims, use only enough shims to produce a slight drag when the crankshaft is rotated. Tap shaft on each end sufficient to ensure that the bearing outer race is tightly against the retainer.

    b. Then add enough shims to remove the slight drag or pre-load (approximately .005" [.127 mm] to .007" [.178 mm]), depending on the amount of pre-load). *The bearings are correctly adjusted when there is .003" to .005" end-play of the crankshaft and the crankshaft will rotate freely. Do not pre-load bearings.*

Assembly...

I. POWER END

A. CRANKSHAFT AND MAIN BEARINGS (Continued)...

• 100T, 130T, 165T, 200T, 250T and 300Q

The crankshaft should be clean and free of burrs. The cone and roller assemblies are to be heated in an electric oven or oil bath to 300°F (149°C). The use of a thermometer is recommended. *Bearing parts are match marked and should be noted prior to heating. Make sure parts are **not** interchanged.*

1. Right Hand Bearing (Short Shaft Extension):
   a. Install chain sprocket on 165T.
   b. With a bearing cone and roller assembly at proper temperature, install on the crankshaft with the thick edge of the taper against the shoulder.
   c. Assemble the bearing spacer and outer race on the crankshaft and against the inboard cone and roller.
   d. Install outboard cone and roller assembly; thin edge against the bearing spacer.
   e. Tighten the lock nut and lock with lock washer prong. (This can best be done **after** the shaft is in the pump). *Make sure cone and roller assemblies are tight against the bearing spacer.*
2. Left Hand Bearing (Long Shaft Extension):
   a. With bearing cone and roller at proper temperature, install on the crankshaft with the thick edge of the taper against the shoulder.
   b. Assemble the bearing spacer against the inboard cone and roller.
   c. Drive outer race into the bearing cage against bottom shoulder.
   d. Install the outer race and cage assembly and gasket against inboard cone and roller.
   e. Install outer cone and roller assembly; thin edge against the bearing spacer.
   f. Assemble lock nuts and lock washer.
   g. Tighten lock nut and lock with prong of lock washer. *Make sure cone and roller assemblies are tight against the bearing spacer.*

Assembly...

I. POWER END (Continued)...

B. CRANKSHAFT AND CENTER SUPPORT ROLLER BEARING ASSEMBLY

• 200T, 250T and 300Q

1. Check the crankshaft bearing surfaces for nicks or burrs and remove.
2. Install snap ring in groove nearest left hand bearing cage.
3. Heat inner race of roller bearing to not more than 300°F (149°C) in electric oven or oil bath and install against snap ring.
4. Install second snap ring on first bearing.
5. Install snap rings in the frame bearing support areas. Install rings in inner grooves.
6. Install snap rings in the frame bearing support areas. Install rings in inner grooves.
7. Roller bearing assembly is a possible light press fit into the frame bore. Slide or gently tap the bearing assemblies into place against the snap rings.
8. Install outer snap rings.

• 100T, 130T, 165T, 200T, 250T and 300Q

1. Install the crankshaft assembly in pump locating the crankshaft bearing cage at the left side with the "TOP" mark up and the plastic gasket in its proper location. Use care when passing the bearing inner race through the first roller assembly.

   NOTE: The crossheads and connecting rods on the old J-100 pumps prior to S/N 9568 must be installed prior to replacing the crankshaft assembly.

2. Check Timken lock nuts and lock washers and tighten securely.
3. Install right hand bearing retainer and gasket. Make certain "TOP" mark is facing upwards. Check clearance of Labyrinth seal to shaft. There should not be any metal-to-metal contact.
4. Install left hand bearing retainer and gasket as described previously.

   NOTE: If pump is to have a gear reducer, it is necessary to replace the left hand bearing retainer with a retainer that has a double drain back area in the labyrinth seal area. Do not use dirt excluder inside the gear reducer.

5. Install dirt excluder tightly against each bearing retainer – except as noted above.

Assembly...

I. POWER END (Continued)...

C. CONNECTING ROD AND CROSSHEAD ASSEMBLY (ALL PUMPS)

1. Press the crosshead pin bushing into the connecting rod.

2. Ream bushing to size (refer to page 34 for dimensions). Blue with pin and scrape bushing to remove high spots. (If service bushings are used, reaming will not be necessary in most cases).

3. Install the crosshead pin by pressing into crosshead or to facilitate assembly, the crosshead may be heated to no more than 300° F (149°C) in an electric oven or bath.

   NOTE: Crossheads are marked "TOP" on extension rod end. Connecting rods and bearing caps are match marked as units. Install connecting rod in crosshead so match marks on top of crosshead correspond.

D. CONNECTING ROD TO CRANKSHAFT ASSEMBLY

• J-30 and J-60
(With Old-Style Straight-Cut Aluminum Connecting Rods)

1. Thoroughly clean and remove all burrs and nicks from connecting rod and crankshaft journals.

2. The connecting rod journals are a precision fit and require no adjustment. Make sure the match marks on connecting rod and cap are the same and on the same side.

3. Install connecting rod bolts and lock-type nuts. Use torque wrench and tighten to torque specified in chart below.

• J-100 and J-150
(With Old-Style Straight-Cut Connecting Rods)

The connecting rod bearings are precise fitting inserts requiring no adjustment. When reinstalling the same inserts, assemble them in pairs at their original location. Make sure the match marks on connecting rod and cap are the same and on the same side.

1. Install rod half of bearing, seat connecting rod on the shaft and install bolts.

2. Install other half of bearing and bearing cap, making sure dowel pins in the bearings are properly joined. Using a torque wrench, tighten to the torque specified in the chart below.

TORQUE: FT-LBS				
PUMP	30T	60T 80T	100T 130T	165T, 200T, 250T, 300Q
Straight, Cut Rod w/ Bolts & Locknuts	20	45	85	--
Straight, Cut Rod w/ Capscrews	--	--	150	--
Slant Cut Rod w/ Capscrews	30	75	150	250

Assembly...

I. POWER END

D. CONNECTING ROD TO CRANKSHAFT ASSEMBLY (Continued)...

• 30T, 60T, 80T, 130T (New Style), 165T, 200T, 250T and 300Q

The connecting rod bearings are precision fitting inserts requiring no adjustment. When re-installing the same inserts, assemble them in pairs at their original location. Make sure the match marks on the connecting rod and cap are the same on the corresponding sides.

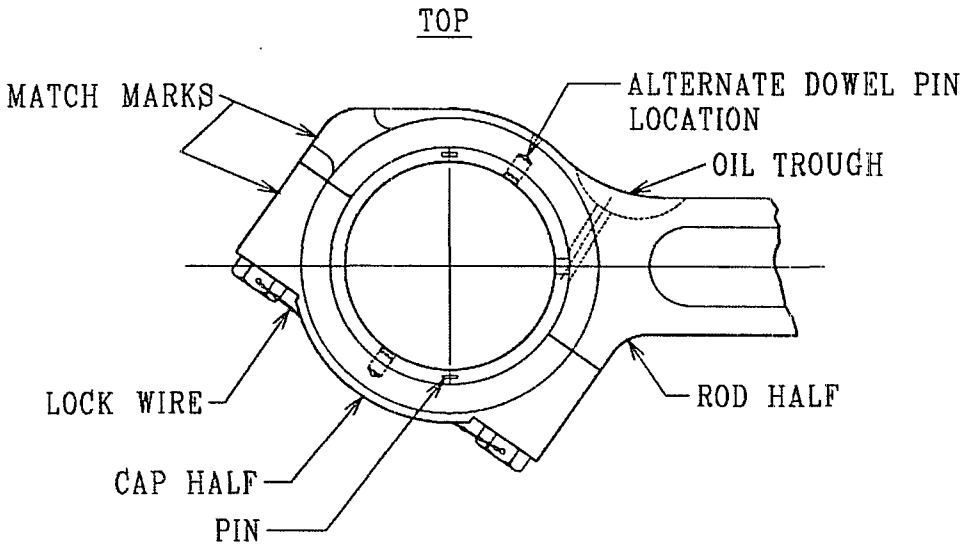


Figure 1

NOTE: It is possible to install these bearing shells incorrectly. Please follow instructions carefully.

Assembly...

I. POWER END

D. CONNECTING ROD TO CRANKSHAFT ASSEMBLY

• 30T, 60T, 80T, 130T (New Style), 165T, 200T, 250T and 300Q (Continued)...

1. Check bearing halves for pin engagement and fit over the dowel pin in the cap half of the connecting rod. Please note the drawing and match marks.

2. Install both bearing halves on the crankshaft with the dowel pins engaged as shown. Position crankshaft throw to the rear.

3. With bearing shells in position (as shown in drawing, pg. 38), fit the cap half of the connecting rod over the bearing shells. Make certain the dowel pin is seated properly and the lubrication hole in the bearing is toward the front so as to match the oil hole in the connecting rod.

   NOTE: Later model connecting rods have the dowel pin located in the rod half. With this pin, the location of the rod is positioned first on the bearing shell.

4. Slide the connecting rod back over the crankshaft throw using caution so the outer surface of the aluminum insert is not damaged. Note the match numbers of the cap and rod to be certain the rod is assembled correctly.

5. Install the two (2) capscrews and torque as shown in chart. Lockwire the capscrews securely.

E. INTERMEDIATE RODS AND OIL SEAL RETAINERS

• 30T, 60T, 80T, 100T, and 130T

Install two oil wipers; lips facing the power end. Open one from the power end side and one from the fluid side. On the power end side the wiper O.D. should be flushed with the face of the retainer. On the fluid end side, the wiper should be pressed in the retainer until it contacts the shoulder in the middle of the retainer. Install the third wiper on the fluid end side of the retainer with lip facing the fluid end.

NOTE: Make sure O.D. wiper and I.D. of retainer are clean and dry before installation of the wiper.

• 100T, 130T, 165T, 200T, 250T and 300Q

Install two (2) oil wipers, lips facing the power end, and two (2) oil wipers with lips facing the fluid end. The inner wipers should shoulder against the raised area in the center of the retainer. Make certain the retainer and wipers are clean and dry before installation. An oily or greasy surface can cause the wipers to become loose.

Assembly...

I. POWER END

E. INTERMEDIATE RODS AND OIL SEAL RETAINERS (Continued)...

• ALL PUMPS

Rotate the crankshaft until the crosshead is all the way forward and install the retainer and rod as a unit.

NOTE: Make sure retainer gasket is in place prior to installation. Tighten rod and the crosshead using a back-up wrench on the crosshead to the following torques:

Threads	30T	60T 80T	100T 130T	165T, 200T, 250T & 300Q
Dry (ft-lbs)	175	200	400	480
Lubricated (ft-lbs)	150	150	325	385

II. FLUID END

A. STUFFING BOXES AND PLUNGERS

Plungers are available in ceramic or steel.

! ATTENTION !

NATIONAL OILWELL VARCO DOES NOT RECOMMEND THE USE OF CERAMIC PLUNGERS FOR PUMPING FLAMMABLE LIQUIDS.

• 30T, 60T, and 80T

1. Thoroughly clean and remove any nicks or burrs from all mating surfaces of the main frame, fluid cylinder and stuffing boxes.
2. Insert stuffing boxes into main frame.

   NOTE: The stuffing box is a press fit in the main frame and will have to be driven into position.

! ATTENTION !

PREVENT DAMAGE BY PLACING A BLOCK OF WOOD OVER THE STUFFING BOX FACE.

Assembly...

II. FLUID END

A. STUFFING BOXES AND PLUNGERS

• 30T, 60T, and 80T (Continued)...

NOTE: Stuffing box flange face should extend .001" to .004" (.025 mm to .102 mm) beyond the frame face to assure proper crush on the stuffing box seal. If this condition does not exist, premature gasket failure will occur!

3. Insert seals (stuffing box to fluid cylinder) into grooves in the face of the stuffing boxes. Grease lightly to hold in place until fluid cylinder is installed.

4. Assemble packing in stuffing box bore as per instructions included with each set of packing, or as described on pages 47 to 50.

• 100T, 130T, 165T, 200T, 250T and 300Q

1. Rotate crankshaft until the intermediate rod is at the end of the suction stroke.

2. With the stuffing box packing and plunger installed, slide the assembly into the pilot bore. If properly aligned and lubricated, the stuffing box will slide easily into place. When a flanged retainer is used with the stuffing box, make certain the lubrication fitting hole is at the top.

3. Tighten stuffing box hex nuts to the following torque values:

Threads	100T, 130T	165T, 200T, 250T & 300Q
Dry (ft-lbs)	400	800
Lubricated (ft-lbs)	325	640

4. Install rubber baffle (if used) on intermediate rod and connect plunger to intermediate rod with threaded connection or clamped connection. Make sure the mating surfaces are clean and free from nicks and burrs.

   Tighten plunger rod using the following torques (threaded plungers):

Threads	100T, 130T	165T, 200T, 250T & 300Q
Dry (ft-lbs)	400	480
Lubricated (ft-lbs)	325	385

   Tighten capscrew in plunger clamp assembly as follows (clamped plungers):

PUMPS:	100T, 130T	165T, 200T, 250T & 300Q
Maximum Torque Value	15 ft.-lbs.	15 ft.-lbs. (21) 3/8" 1-bolt clamp 30 ft.-lbs. (45) 1/2" 2-bolt clamp

5. Adjust stuffing box nut. (Adjusting nut should be tightened with the bar furnished with the pump). See instructions on pages 43 through 46 for proper packing procedure and lubrication practices.

Assembly...

II. FLUID END (Continued)...

B. FLUID CYLINDER (ALL PUMPS)

1. Install fluid cylinder, check stuffing box seals as cylinder is moved into place.
2. Tighten nuts alternately, pulling fluid cylinder up evenly; torque nuts to the following values:

THREADS	30T	60T 80T	100T 130T	165T, 200T, 250T & 300Q
Dry (ft-lbs)	300	500	400	800
Lubricated (ft-lbs)	240	450	325	640

3. When installing the suction discharge piping, always use the capscrews furnished with the pump as they are special high-strength and double heat-treated.

C. FLUID VALVES – SPHERICAL, TAPERED SEAT BOTTOM GUIDED AND CAGE TYPE (ALL PUMPS)

See Valve section of this manual.

D. PIPING INSTALLATION (ALL PUMPS)

1. Install flanges on fluid cylinder with special high carbon double heat-treated capscrews furnished with the pump.
2. Install suction and discharge lines to flanges.

Assembly...

II. FLUID END (Continued)...

E. PLUNGER PACKING INSTALLATION

1. 850-N Packing

It is important that the following procedure be observed when replacing old packing to prevent rapid packing wear:

a. Remove front crosshead reservoir cover plate and rotate pump to bring the desired plunger to the forward position.

b. Back off locking setscrew (if used) at intermediate rod crosshead connection and intermediate rod plunger connection. Using back-up wrenches, loosen connection one-fourth (1/4) turn.

c. Rotate crankshaft until plunger is all the way back. Unscrew plunger or remove clamp assembly and slide plunger forward.

d. Remove intermediate rod and intermediate rod seal retainer from as one assembly.

e. Remove plunger and old packing, making sure stuffing box is clean. Plungers and boxes may be removed as an assembly by rotating the pump so the intermediate rod is all the way back, thereby disconnecting the plunger and sliding the stuffing box back and out.

f. Oil each ring with light oil **(DO NOT GREASE)**, and install packing per sketch included with the packing. Make sure the lips on the sealing rings face pressure shown.

g. Install gland and pull down hand tight against packing.

h. Install plungers, then pull adjusting nut down as tight as possible with bar furnished with the pump. **DO NOT USE A CHEATER!!**

i. Install intermediate rod and retainer. Connect plunger and torque properly as outlined on page 47 & 48.

j. For 850-N packing, start pump and operate under pressure; retighten adjusting nut. After pump has been running for two (2) or three (3) hours under pressure, packing will seat itself and the adjusting nut should be tightened as much as possible to eliminate any movement of the packing in the stuffing box. Use the bar furnished with the pump. **Do not use a cheater!**

k. The adjusting nuts should be checked and each tightened for the first 2 or 3 days until the packing is completely seated and the adjusting nuts cannot be tightened any further. Use the bar furnished with the pump. **Do not use a cheater!**

Assembly...

II. FLUID END

E. PLUNGER PACKING INSTALLATION (Continued)...

2. 1045 PACKING (also called No. 265)

It is important that the following procedure be observed when replacing old packing to prevent rapid packing wear:

a. Remove crosshead reservoir and rotate crankshaft to bring plunger forward.

b. Back off locking set screw (if used) at intermediate rod crosshead connection and intermediate rod plunger connection. Using back-up wrench, loosen this connection one-fourth (1/4) turn.

c. Rotate crankshaft until plunger is all the way back, unscrew plunger or remove clamp assemblies and slide plunger forward.

d. Remove intermediate rod and intermediate rod seal retainer from pump as one assembly.

e. Remove plunger and old packing, making sure stuffing box is clean. Plungers and boxes may be removed as an assembly by rotating the pump so the intermediate rod is all the way back, disconnecting the plunger and sliding the stuffing box back and out.

f. Starting with the first Phenolic ring, seat each ring individually in the order packaged. Eliminate the No. 1 Phenolic ring when using a sleeve washer with ceramic plungers.

g. Install plunger and make-up the adjusting nut tight to insure the entire packing set is properly seated. The nut should be loosened and adjusting hand tight.

h. Install intermediate rod and retainer. Connect plunger and torque properly as outlined on page 47 & 48.

i. Start the pump and run with normal system pressure. Tighten the adjusting nut, carefully watching for excessive heat build-up. Continue to tighten the nut until it is a good, snug fit and the nut shows no movement in the threads.

! IMPORTANT !

IF THE ADJUSTING NUT LOCKS AND CANNOT BE MOVED, IMMEDIATELY REMOVE THE PRESSURE FROM THE PUMP, BACK OFF THE NUT ONE-HALF (1/2) TURN, AND START AGAIN.

j. This packing may or may not leak, depending on the circumstances, and it does not require continuous adjustment. It should be checked and re-tightened the first day or two after installation of new packing, but should require very little attention after this.

k. This packing can be used on hard coated or ceramic plungers without lubrication, but as with any packing, extended life is possible through the use of lubrication. When using a mechanical or drip type lubrication system in water service, use rock Drill (Air Drill) Oil of the proper viscosity. Drip five to seven drops per minute.

Assembly...

II. FLUID END (Continued)...

E. PLUNGER PACKING INSTALLATION

3. 699 PACKING

For top performance from the soft packing of "Teflon" fiber read and carry out the following instructions. Use the above method to remove and re-install intermediate rod and plunger.

a. Packing may be butt or diagonal cut. Stagger joints in successive rings at least 90°.

b. Slide rings into stuffing box, but do **not** tap or drive rings into place. Tests have shown that this method gets maximum performance from soft packing of "Teflon" fiber.

c. Tighten stuffing box nut finger tight and start pump. Packing should be leaking, if not, loosen stuffing box nut. Remember, install this soft packing with a minimum of gland pressure to minimize friction and heat build-up.

d. Reduce leakage to desired level by tightening stuffing box nut about 1/6 turn at a time every few minutes.

e. If gland heats up to a temperature that will boil water, back-off stuffing box nut and repeat run-in until temperature remains after nuts are re-tightened.

"Teflon" is DuPont's registered trademark for TFE- Fluorocarbon fiber.

4. SPRING LOADED KEVLAR MULTIPLEX PACKING

- Recommended Packing Procedure -

a. Before re-packing, determine cause of failure.

b. Remove plunger, stuffing box nut, and all internal parts in stuffing box. Remove stuffing box itself if necessary to clean.

c. Clean all parts and determine if parts are worn or reusable. Replace all worn parts.

d. Soak new packing elements in oil. Lubricate all other parts.

e. Note the depth of stuffing box bore. If greater than four inches (4"), install appropriate spacer. See appropriate parts-list for applicable spacer.

f. Install parts into stuffing box in the following order: spacer (if needed), spring, follower (small end first), Kevlar ring and brass ring (with care), (alternate these items three (3) times, twice for 30T), and then add the bushing (gland ring).

g. Screw on the nut – hand tight.

h. Insert plunger into packing assembly.

Assembly...

II. FLUID END

E. PLUNGER PACKING INSTALLATION

4. **SPRING LOADED KEVLAR MULTIPLEX PACKING** (Continued)...

   i. Tighten packing nut. Bushing should seat and shoulder against stuffing box face. Back off the nut one-half turn.

   j. If stuffing box has been removed, re-install assembly onto multiplex.

   k. Connect plunger to intermediate rod and tighten.

   l. Insert stop pin into stuffing box nut.

   m. Fill lubricator with Rock Drill Oil for normal temperature or steam cylinder oil for high temperature fluids. Fill lubricator lines by pumping it manually. Check its operation.

   n. Start pump at slow speed and low pressure if possible, tighten stuffing box nut and insert stop pin in hole. Watch for a short period of time. Oil if needed.

   o. Set lubricator to twice normal rate. After 24 hours, resume normal operation. Check stuffing box for excessively high temperatures and abnormal leakage.

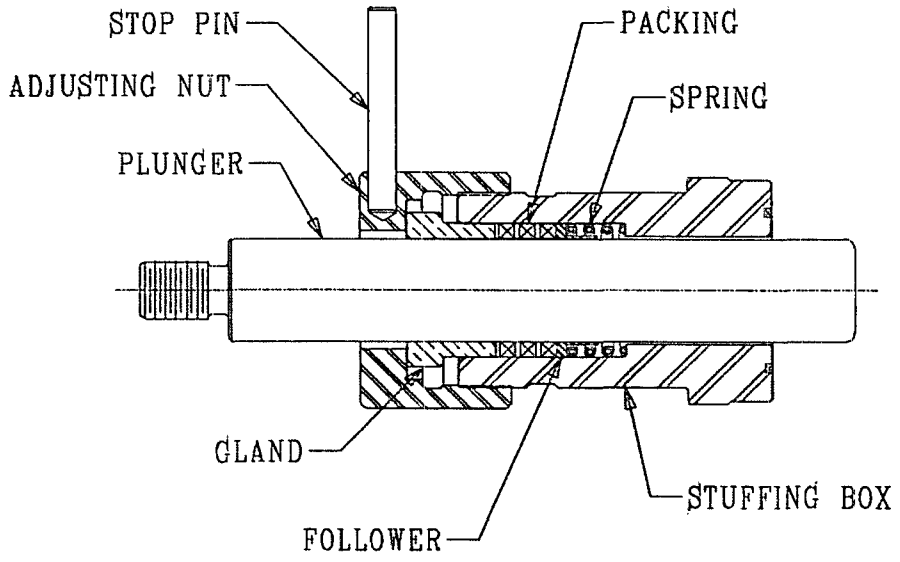


Figure 2

Plunger Pump Valves...

I. OPERATIONAL MAINTENANCE

A. SUCTION AND DISCHARGE

As with any plunger pump, the necessity for having an adequate suction head and proper piping design of both suction and discharge cannot be over emphasized.

! ATTENTION !

NOISY VALVES, DUE TO IMPROPER FILLING, CAN LEAD TO SHORT LIFE AND RAPID MECHANICAL WEAR OF THE POWER END PARTS.

B. VALVE COVERS

⚠ CAUTION ⚠

THE VALVE COVERS, AS USED WITH THE NATIONAL OILWELL VARCO PLUNGER PUMPS, **MUST** BE KEPT TIGHT AT ALL TIMES. DUE TO THE DISCHARGE PRESSURE APPLYING A CONSTANT LOAD TO THE COVERS, IT IS **NOT** POSSIBLE TO CHECK THEIR TIGHTNESS WITH THE PUMP RUNNING OR WITH PRESSURE IN THE CYLINDER.

Bleed off the discharge pressure and check the tightness of the covers as outlined under the assembly procedure for the type of cover used.

C. VALVE CAGE AND COVER SEALS

1. Cage Type Valves

   There are three identical seals in each valve stack. The seals perform a very important function in this design valve and we recommend that they be changed any time they are removed from the pump.

2. Cover Seals

   The cover seals should be replaced as required.

D. VALVE SPRINGS

The springs used with the NATIONAL OILWELL VARCO valves are made of inconel alloy or stainless steel.

! ATTENTION !

THESE SPRINGS SHOULD BE CHANGED APPROXIMATELY ONCE A YEAR IN ORDER TO ASSURE PROPER VALVE ACTION AND ELIMINATE THE POSSIBILITY OF A SPRING BREAK.

Plunger Pump Valves...

I. OPERATIONAL MAINTENANCE (Continued)...

E. VALVE CAGES

The cages are normally made from aluminum, bronze, stainless steel or hardened steel, depending on the type of service. These cages are precision machined to give long, continuous service.

F. VALVE AND SEAT

1. Cage Type Valves:

   There are four basic valve and seat assemblies available, depending on the type of service. They are the disc type, the ball type, the wing-guided type, and the spherical type. These valves can be made available in a variety of materials on special order.

2. Tapered Seat Valves:

   There are two basic OEM valve & seat assemblies available, depending on the type of service. They are the bottom guided (BG) tapered seat valves and the spherical tapered seat valves. The BG valve and seat are available in a variety of materials depending on the type of fluid being pumped. The spherical valves are made of Nitronic 50 material.

Plunger Pump Valves (Continued)...

II. CAGE TYPE VALVES

The NATIONAL OILWELL VARCO cage type valve is a patented design valve. This manual will assist in performing the normal maintenance requirements of the valves.

A. NOMENCLATURE

1. Acme threaded valve cover with center bolt. (One piece solid cover used on 30T, 60T or 80T).
2. Retainer (not used on 30T, 60T or 80T).
3. Cover and Cage Seal, Suction or Discharge (interchangeable).
4. Disc Valve Cage, Suction or Discharge (interchangeable).
5. Valve Spring, Suction or Discharge (interchangeable).
6. Stop, Valve Disc, 30° Taper Cut in Cage, not used in Ball Valve Cages.
7. Valve Disc, Valve suction or Discharge (interchangeable).
8. Valve Seat, Discharge only - Small bore (I.D.) used to retain Suction Spring.
9. Valve Seat, Suction Only - Large Bore (I.D.) same as Suction Throat Bore.
10. Valve Seat Suction and Discharge (interchangeable).

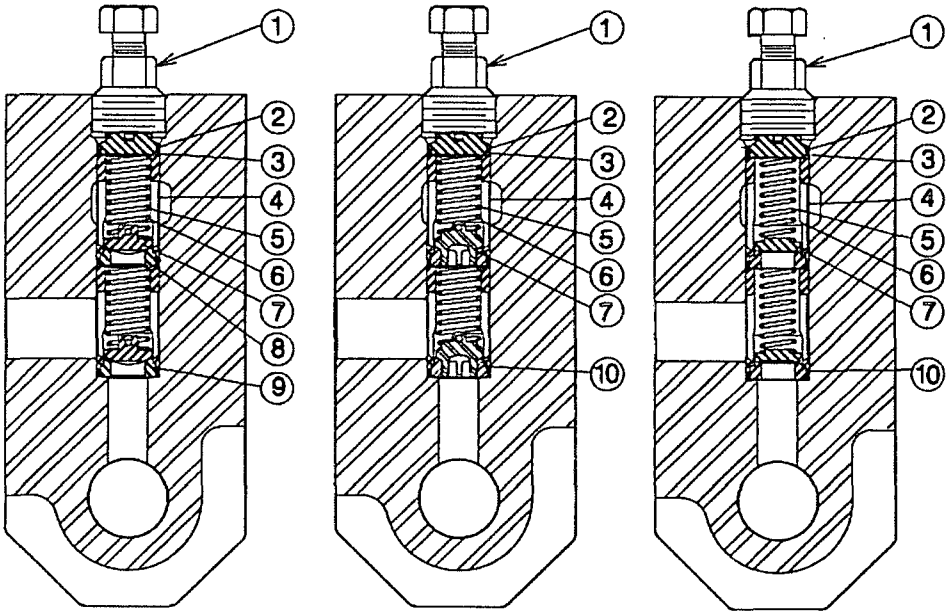


Figure 3

Plunger Pump Valves...

II. CAGE TYPE VALVES (Continued)...

B. VALVE SERVICING TOOLS (charts)

The valve servicing tools referred to on the following pages are listed below:

CAGE TYPE VALVES
(SPHERICAL, BOTTOM GUIDED, BALL, & DISC)

Pump Size	Valve Kit	Cage Puller	Cage Bumper	Seat Drive	Magnet Retriever
30T-2H, 60T-3H, 80T-3H	1710292	1710249	1790080	1790040	1790034
30T-2L, 60T-3M, 80T-3M, 100T-4H, 130T-4H	1711251	1711249	1790080	1790041	1790034
100T-4M, 130T-4H, 130T-4M, 165T-5H, 165T-5HA, 200T-5H, 200T-5HA, 250T-5H, 250T-5HA	1712342	1712242	1790080	1790042	1790034
165T-5M, 200T-5M, 250T-5M, 300Q-5M	1713068	1713069	1790085	1790043	1790034
375T-7H	1715338	1715339	1790085	1790053 G-1790062 G-1715342	1790034
165T-5HB, 200T-5HB, 250T-5HB, 300Q-5H	1713351	1713352	1790085	G-1790064	1790034

Plunger Pump Valves...

II. CAGE TYPE VALVES (Continued)...

C. DISASSEMBLY PROCEDURE

1. Remove threaded cover. (The covers should be tight enough to require an extension on a 24" pipe wrench to loosen). Inspect threads for wear, which could occur if cover was loose.
2. Remove retainer with hook on a magnetic retriever. Some retainers are tapped with a lifting thread for removal.
3. Remove cover seal from top of cage with hook on magnetic retriever. (This hook is rough ground at the plant and should be finished to a flat sharp edge to be most effective). (See Figure 4).
4. Before removing spring, observe amount of pre-load. Spring should extend about 1/8" to 3/16" above the top of the cage. It is not recommended that you stretch a spring to secure the correct pre-load as this causes physical damage to the spring. This should be done only on these cases where a new spring is not available. Remove the spring with hook. (See Figure 6).
5. Remove cage with puller as illustrated. Under normal conditions, these cages are readily removed. If the fluid being pumped makes mineral deposits (gyp) in the cage bore, this will immediately alert the customer that he should start some type of treating program to protect his complete system.
6. Using magnet or hook, remove valve disc. (See Figure 6).
7. Insert valve seat driver in discharge seat and rock back and forth. This action will loosen the seat and allow it to be removed with the hook. (See Figure 7).
8. Assemble upper valve as removed to keep parts together.
9. Remove seal from top of lower cage.
10. Remove spring with hook. Note: Notice if spring had proper pre-load.
11. Remove cages using same procedure as No. 4.
12. Using magnet, remove valve disc.
13. Insert valve seat driver in suction seat and rock back and forth. This action will loosen the seat and allow it to be removed with the hook.
14. Assemble lower valve as removed to deep parts together.
15. Remove bottom seal.
16. Inspect cylinder bore with flashlight paying particular attention to sealing areas.

*If necessary, repeat the above steps in the remaining cylinder bores.

Plunger Pump Valves...

II. CAGE TYPE VALVES

C. DISASSEMBLY PROCEDURE (Continued)...

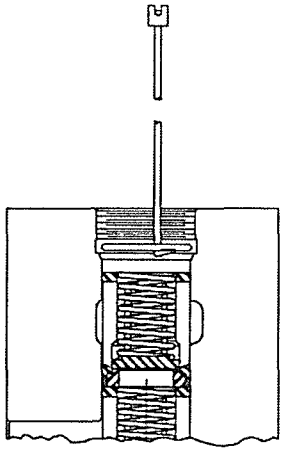


Figure 4

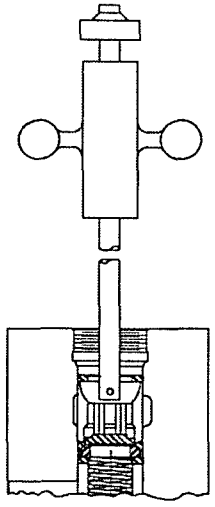


Figure 5

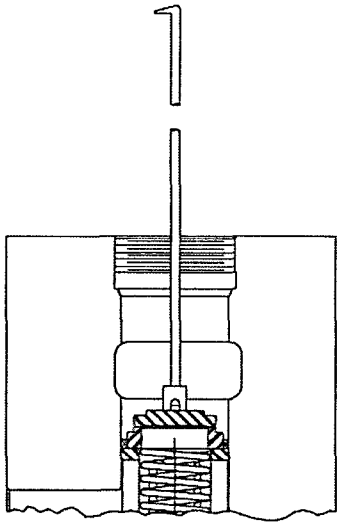


Figure 6

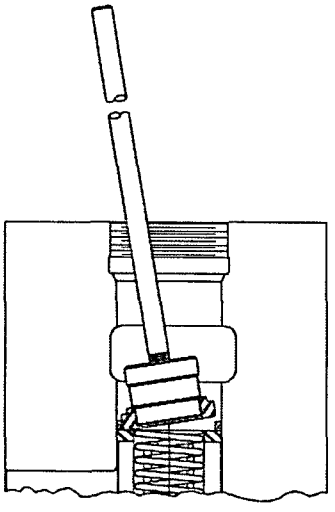


Figure 7

Plunger Pump Valves...

II. CAGE TYPE VALVES (Continued)...

D. VALVE PARTS INSPECTION

1. CAGE (Bottom Guide, Disc, Ball, or Spherical)

The cages used in the National Oilwell Varco Valve Assembly are precision machined and designed for long trouble-free service. Erratic valve action associated with poor suction conditions can cause accelerated wear on this part.

! ATTENTION !

A LOOSE COVER WILL ALLOW CAGE MOVEMENT AND WILL CAUSE EXTENSIVE DAMAGE TO CAGE AS WELL AS FLUID END.

Each cage that is removed should be inspected at the following points referred to in the drawing, Figure 8.

a. Inspect for wear in this area. It is best to do this with the valve and seat in the cage, therefore, a more accurate decision can be made. The wear in this area, which can be judged by the sideways movement of the disc, should not exceed 1/2 the width of the seating surface of the disc valve or more than 1/8" to 3/16" for the ball valve. These are maximum figures and could result in poor valve action and some loss of efficiency. If in doubt, change the cage.

b. Inspect the valve seat shouldering area for signs of wear or hammering. If this portion of the cage is cracked or battered, the cage should be replaced. This will only happen if the cage is allowed to move in the bore due to loose covers.

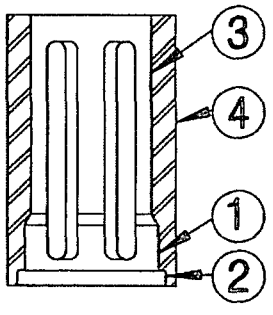


Figure 8

c. Inspect cage bore for excessive spring. In most cases this area will wear only if there is poor valve action or extremely corrosive water that attacks the cage material in this wear zone.

d. Inspect O.D. of cage for nicks, burrs or washers. Clean cage thoroughly before replacing.

Plunger Pump Valves...

II. CAGE TYPE VALVES

D. VALVE PARTS INSPECTION (Continued)...

2. VALVE, BOTTOM GUIDED AND SEAT

The standard (-25) NATIONAL OILWELL VARCO bottom guided disc and seat is made from a specialty stainless steel, which is strictly resistant to corrosion. An optional heat treated stainless steel (-4) valve is available for less corrosive fluids that contain solids. The standard valve is non-magnetic, so a loop is provided for removal from the fluid cylinder.

The following inspection points should be observed:

a. The valve seat and sealing surface should be closely inspected for evidence of excessive wear and /or washed areas. The amount of wear can be determined by comparison with a new valve and seat. Worn valves and seats should be replaced.

b. Inspect the valve guides and seat bores for guide wear. Valves with excessively worn or broken guides and grooved seats should be replaced.

c. Inspect the outside surface of the valve and seat for nicks, burrs or washers, and thoroughly clean before assembly.

3. VALVE, SPHERICAL AND SEAT

The standard NATIONAL OILWELL VARCO spherical valve & seat is made from a specialty stainless steel which is strictly resistant to corrosion. The valve is non-magnetic so a loop may be provided for removal from the fluid cylinder.

The following inspection points should be observed:

a. The valve seat & sealing surface should be closely inspected for evidence of excessive wear and/or washed areas. The amount of wear can be determined with a new valve & seat. Worn valves & seats should be replaced.

b. Inspect the outside surface of the valve & seat for nicks, burrs, or washes, and thoroughly clean before assembly.

Plunger Pump Valves...

II. CAGE TYPE VALVES

D. VALVE PARTS INSPECTION (Continued)...

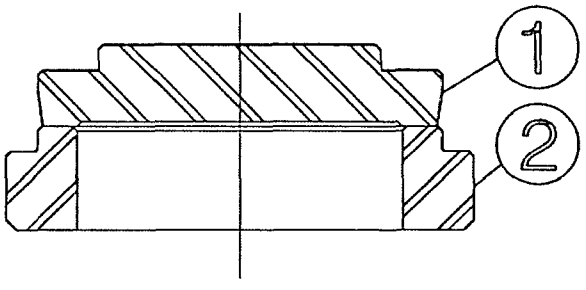
4. VALVE, DISC AND SEAT

The NATIONAL OILWELL VARCO disc-type valve is made from heat treated stainless steel. An optional 316 stainless steel valve is available for severe corrosive service. The 316 stainless steel valve is non-magnetic and cannot be picked up with a magnet. The heat-treated valve is magnetic:

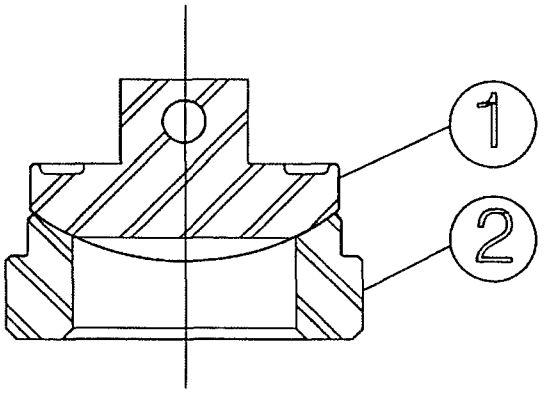
The following inspection points should be observed (See Figure 9):

a. The valve and seat sealing surfaces should be closely inspected for evidence of excess wear and/or washed areas. The amount of wear can be determined by comparison with a new valve and seat or by observing the amount of undercut still remaining on the disc seating surface. If this face is flat, the valve disc and probably the seat should be replaced. Small washes or cuts in the seating surface can sometimes be removed with emery cloth. The seating surfaces should then be ground, or polished, to a smooth finish. A good field method is to lay the fine emery cloth or crocus cloth on the milled top of the cylinder and polish the disc and seat on this surface.

b. Inspect the outside surface of the disc and seat for nicks, burrs, or washes, and thoroughly clean before assembly.



Disc & Seat



Spherical Valve & Seat

Figure 9

Plunger Pump Valves...

II. CAGE TYPE VALVES

D. VALVE PARTS INSPECTION (Continued)...

5. VALVE, BALL & SEAT

The NATIONAL OILWELL VARCO ball and seat valve is composed of the same material as the Fluid Packed Supreme Ball and Seat. The seat is reversible and the seating surfaces should indicate if replacement is necessary.

6. SPRINGS

The springs as used in the NATIONAL OILWELL VARCO cage-type valve assemblies are designed for long trouble-free service. If installed correctly with the proper pre-load and operated under normal conditions, which include a good suction that provides a smooth valve action, these springs will operate for a year or more.

! ATTENTION !

IT IS BEST YOU CHANGE SPRINGS AND DESTROY THE OLD ONES APPROXIMATELY ONCE A YEAR. IF THE SPRINGS FATIGUE AND BREAK, THE RESULTING VALVE ACTION CAN DAMAGE THE CAGE AND VALVE. HERE AGAIN, IF IN DOUBT, CHANGE THE SPRING; THEIR COST IS VERY MODERATE.

7. SEALS, VALVE CAGE

The NATIONAL OILWELL VARCO cage-type valves are of a stacked design and depend on the seal at the top, middle and bottom of the stack to isolate the suction and discharge valves and their associated changes in pressure. These seals should be changed every time the valves are removed from the pump. If it is absolutely necessary to re-use these seals, install the best seal in the middle stack, the next best at the bottom and the worst seals on the top covers. Replace used seals with new ones as soon as possible.

Plunger Pump Valves...

II. CAGE TYPE VALVES (Continued)...

E. ASSEMBLY PROCEDURES

1. After all parts have been thoroughly inspected and cleaned, assemble each valve unit on top of the pump leaving off the seals. Make certain the seat is shouldered up in the cage and the spring is correctly positioned on the disc. Now, check the spring for correct pre-load which should be with 1/8" to 3/16" of spring extending above top of cage. (See Figure 10)

2. Check cylinder bores for nicks, scratches, cuts or washed areas with flashlight. Fluid end should be reworked if these are too deep for seal to work effectively.

3. Place new seal in cylinder bore and push to bottom with hook. Gently tamp the seal into the bottom of the bore. (See Figure 11).

4. Using handle of seat driver as a guide, drop a suction seat on top of gasket. The handle will prevent the seat from turning over when dropped.

   NOTE: Suction seat has a larger bore (I.D.) than the discharge seat.

5. Insert seat driver in suction seat, and using a hammer, tap the seat into seal until it is solid with bottom of bore. (Check seat, be certain top side is up). (See Figure 12).

6. Place valve disc on magnet with spring in position on top of valve disc, and lower into place on top of seat. Leave magnet standing in bore.

   NOTE: Valve discs are interchangeable between suction and discharge seats. (See Figure 13).

7. Insert cage in bore, using handle of seat driver, tap cage gently to the bottom.

   NOTE: The cages fit the bores very closely. Use care when inserting the cage to be sure it is not cocked. Work the cage gently - it will slide into the bore when correctly aligned.

   Lift the valve disc with the magnet to make certain it is not caught under the cage, and using a hammer, gently drive the cage down until solid. (See Figure 14).

8. Check disc springs to see that they are free in the cage. Pull magnet loose. (See Figure 15).

9. Using a flashlight, check the spring for correct positioning on valve disc and for proper pre-load. Check valve disc to be certain top side is up. (See Figure 15).

10. Place seal in cylinder bore and push to top of suction cage with hook. Gently tamp seal into position.

11. Drop discharge seat using handle as described in No. 4.

12. Drive seat solid on top of cage. In some cases, the pre-load from the suction spring will push the seat up after it is driven - this is normal.

Plunger Pump Valves...

II. CAGE TYPE VALVES

E. ASSEMBLY PROCEDURES (Continued)...

13. Place valve on magnet with spring in position and lower into place on top of seat. Leave magnet standing in the bore.

14. Insert cage and drive using the same procedure as No. 7.

15. Inspect using same procedure as No. 7.

16. Check valve assembly with flashlight using same procedure as No. 8.

17. Place seal on retainer and install in cylinder. Screw threaded cover down by hand until threads are fully engaged. Torque center bolts to following values:

PLUNGER PUMP SIZE	TORQUE (Dry)	TORQUE (Lubricated)
30T-2H, 30T-2L, 60T-3H, 60T-3M, 80T-3H, 80T-3M	500 ft-lbs	400 ft-lbs
100T-4H, 100T-4M, 130T-4H, 130T-4M, 165T-5M, 300Q-5HA, 200T-5H, 250T-5H	550 ft-lbs	450 ft-lbs
165T-5M, 300Q-5M, 200T-5M, 250T-5M	650 ft-lbs	525 ft-lbs
165T-5H, 200T-5H, 250T-5H, 300Q-5HB	900 ft-lbs	735 ft-lbs
375T-7H	1300 ft-lbs	1060 ft-lbs

Plunger Pump Valves...

II. CAGE TYPE VALVES

E. ASSEMBLY PROCEDURES (Continued)...

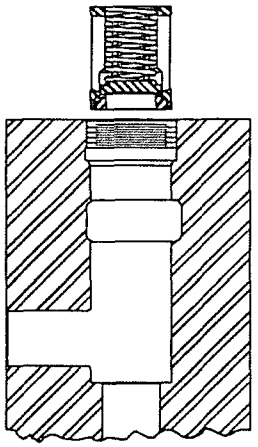


Figure 10

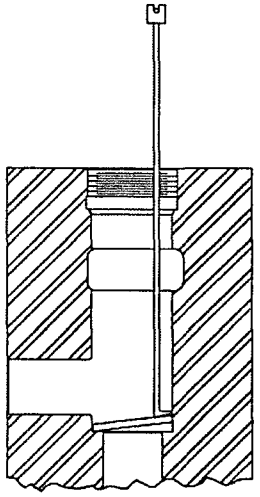


Figure 11

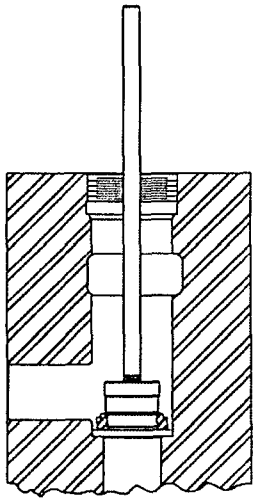


Figure 12

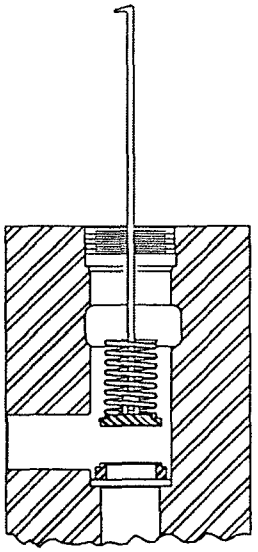


Figure 13

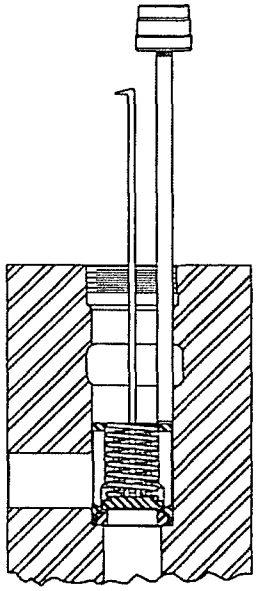


Figure 14

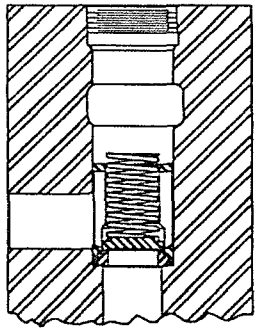


Figure 15

Plunger Pump Valves (Continued)...

III. TAPERED SEAT VALVES

A. SPHERICAL VALVES and SEATS

1. VALVE REMOVAL PROCEDURE

a. Both suction and discharge valves are removed from the top of the cylinder. It is necessary to pull the discharge valve prior to pulling the suction valve.

b. Remove the spring retainer by pressing downward on the puller head and turn counter clockwise about 1/8 of a turn or until retainer stops. Remove the retainer with the retriever. See Figure 17.

c. Remove spring(s) and valve with the retriever. See Figure 18.

d. Remove seat by placing the puller head through the seat opening and engage lugs to the underside of the seat. Pull seat or bump seat loose and remove. See Figure 19.

2. INSTALLATION PROCEDURE

a. Make certain cylinder tapers are clean and dry. Inspect for corrosion or damaged areas. Repair or replace as required.

b. Clean and dry spherical seat tapers and with retainer and spring(s) removed, place seat in place making certain it is straight.

c. With a bar and a driver tap seat in place with 2 or 3 strokes. **NOTE!!** Seat does not have to be completely seated. Pump start-up pressure will drive seat home. See Figure 20.

d. Install valve, spring(s), and spring retainer. See Figure 21.

Plunger Pump Valves...

III. TAPERED SEAT VALVES

A. SPHERICAL VALVES and SEATS (Continued)...

VALVE COMPLETE, Consists of:						
ITEMS INCLUDED		2-1/2"	3"	3-1/2"	4"	5"
VALVE COMPLETE	SUCTION	1792520-25	1793020-25	1793520-25	1794020-25	1795020-25
	DISCHARGE	1792522-25	1793022-25	1793522-25	1794022-25	1795022-25
SEAT	SUCTION	1792521-25	1793021-25	1793521-25	1794021-25	1795021-25
	DISCHARGE	1792523-25	1793023-25	1793523-25	1794023-25	1795023-25
VALVE (ONLY)		1792527-25	1793027-25	1793527-25	1794027-25	1795027-25
SPRING (SUCTION)		1792525	1793025	1793525	1794025	1795025
RETAINER		1792524-6	1793024-6	1793524-6	1794024-6	1795024-6
SPRING (DISC)	INNER	1792526	1793026	1793526	1794026	NONE
	OUTER	1792525	1793025	1793525	1794025	1795025

PULLER KIT, Consists of:					
ITEMS INCLUDED	2-1/2"	3"	3-1/2"	4"	5"
PULLER KIT	180104119	180104127	180104135	180104143	180104151
PULLER HEAD	181205709	181259300	181259359	181259409	181259410
RETRIEVER	1790034				
SPACER	181205709				181205710
WASHER	20-220-194				20-220-327
NUT	75-518-308				75-510-330

Plunger Pump Valves...

III. TAPERED SEAT VALVES

A. SPHERICAL VALVES AND SEATS (Continued)...

Figure 16

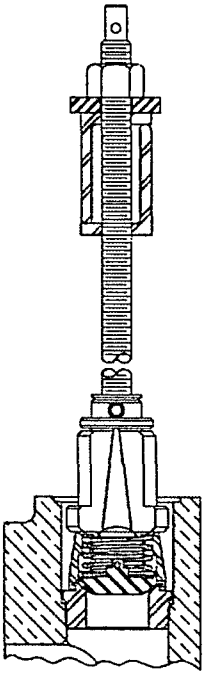


Figure 17

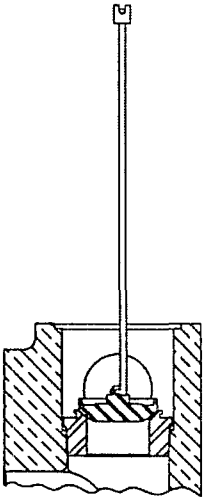


Figure 18

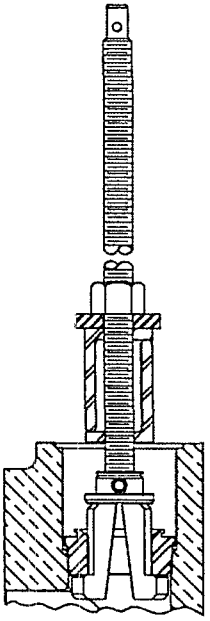


Figure 19

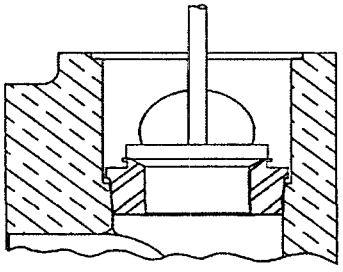


Figure 20

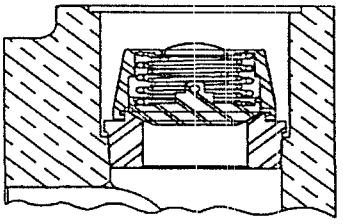


Figure 21

Plunger Pump Valves (Continued)...

III. TAPERED SEAT VALVES

B. TAPERED SEAT-BOTTOM GUIDED VALVES

1. VALVE REMOVAL PROCEDURE

a. Using hex head wrench as shown in Figure 23, remove retainer and spring. Bottom guided valves can be removed with a magnet or special valve retriever.

b. Screw puller head on valve seat until tightly shouldered. Valve seat can be pulled or bumped as shown in Figure 24.

2. INSTALLATION PROCEDURE

a. Make certain fluid end tapers are clean and dry. Inspect for corrosion or damaged areas to see if repair is required.

b. Clean and dry valve seats tapers and with retainer and spring removed, place seat in place making sure it is straight.

c. With bottom guided valve in place, drive the seat, as shown in Figure 25, until it stops driving.

d. Check bottom-guided valve to be sure it is free in the seat and install spring and retainer. Torque retainer to values shown below using hex head wrench as shown in Figure 26.

TORQUE ft.-lbs.	2-1/2"	3"	3-1/2"	4"
	100	100	100	100

Plunger Pump Valves...

III. TAPERED SEAT VALVES

B. TAPERED SEAT-BOTTOM GUIDED VALVES (Continued)...

VALVE COMPLETE, Consists of:					
ITEMS INCLUDED		2-1/2"	3"	3-1/2"	4"
VALVE (Complete).....	Suction	1792500-4	1793000-4	1793500-4	1794000-4
	Discharge	1792502-4	1793002-4	1793502-4	1794002-4
SEAT	Suction	1792501-4	1793001-4	1793501-4	1794001-4
	Discharge	1792503-4	1793003-4	1793503-4	1794003-4
VALVE (Only).....		1790066	1713502	1790067	1790068
SPRING.....		1792505	1793005	1793505	1794005
RETAINER		1792504-26	1793004-26	1793504-26	1794004-26

PULLER KIT, Consists of:				
ITEMS INCLUDED	2-1/2"	3"	3-1/2"	4"
PULLER KIT	1792507	1793007	1793507	1794007
PULLER HEAD	1792506	1793006	1793506	1794006
BUMPER	1790080			
BAR	1790081			
WRENCH	1790082			
RETRIEVER	1790034			
SUPPORT	1713109			
NUT	6300160			
FLANGED NUT	6314002			

Plunger Pump Valves...

III. TAPERED SEAT VALVES

B. TAPERED SEAT-BOTTOM GUIDED VALVES (Continued)...

REMOVAL

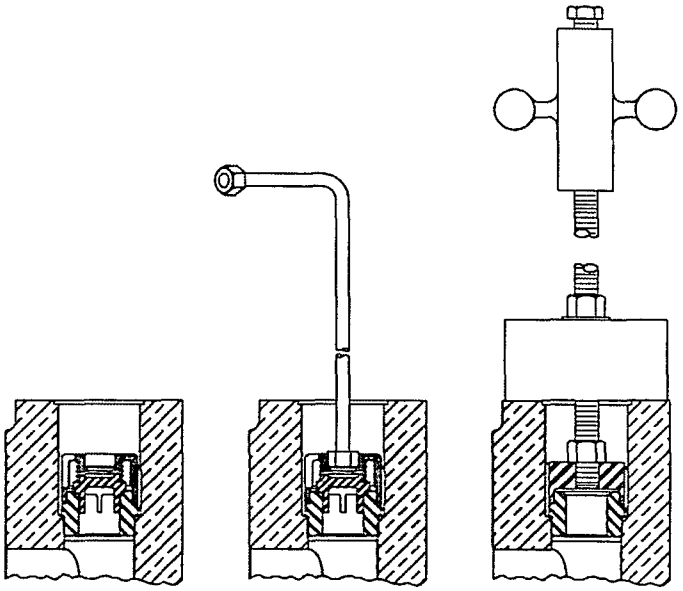


Figure 22 Figure 23 Figure 24

INSTALLATION

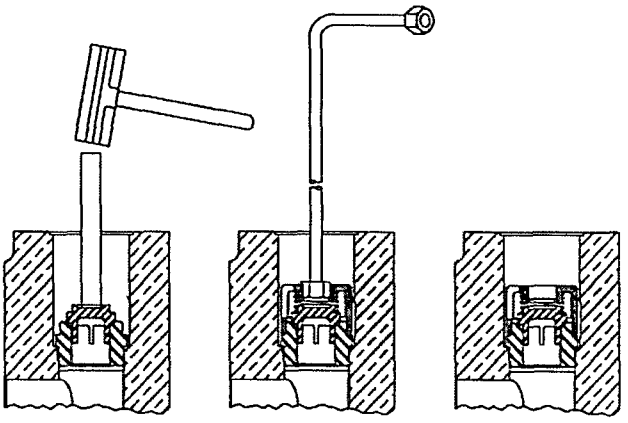


Figure 25 Figure 26 Figure 27

Gear Reducer...

I. LUBRICATION AND MAINTENANCE

A. GENERAL

NATIONAL OILWELL VARCO plunger pump gear reducers are "splash" lubricated. The rotation of the gears provides adequate lubrication to all working parts. The gear reducer housing and the plunger pump power end are separated by a labyrinth oil seal on the 30T, and a labyrinth oil seal retainer on the 60T, 80T, 100T, 130T, 165T, 200T, 250T and 300Q. These seals separate the lubricating oils and prevent contamination.

Initial filling should be through the hand hole cover and can be gauged by the high and low level oil plugs in the housing. Correct level is at the bottom of the high level plug.

1. OIL

Use an extreme pressure gear oil. The following chart shows the recommended grades for various temperatures surrounding the pump.

U.S. UNITS OF MEASURE	
Temperature	**AGMA Industrial EP Gear Oil**
+50°F to +155°F	AGMA No. 6 EP or ASTM/ISO Grade No.320 (Viscosity 1335 to 1632 SSU at 100°F)
+20°F to +100°F	AGMA No. 5 EP or ASTM/ISO Grade No.220 (Viscosity 918 to 1122 SSU at 100°F)
+20°F to +60°F	AGMA No. 2 EP or ASTM/ISO Grade No.68 (Viscosity 284 to 347 SSU at 100°F)

METRIC UNITS OF MEASURE	
Temperature	**AGMA Industrial EP Gear Oil**
+10°C to +68°C	AGMA No. 6 EP or ASTM/ISO Grade No.320 (Viscosity 288 to 352 cSt at 37.8°C)
-7°C to +38°C	AGMA No. 5 EP or ASTM/ISO Grade No.220 (Viscosity 198 to 242 cSt at 37.8°F)
-29°C to +16°C	AGMA No. 2 EP or ASTM/ISO Grade No.68 (Viscosity 61 to 75 cSt at 37.8°F)

Oil must pour freely at a minimum operating temperature. Change oil every six months or as frequently as operating conditions require to maintain a clean, sludge-free oil of proper viscosity.

Gear Reducer...

I. LUBRICATION AND MAINTENANCE

A. GENERAL

1. OIL (Continued)...

GEAR REDUCER OIL CAPACITY			
Pump	**Ratio**	**Gal.**	**Ltr.**
30T	3.50, 3.83, 4.20	2/3	2.5
60T, 80T	2.34, 2.77, 3.035, 3.50	1	3.8
100T, 130T	2.60, 3.15, 3.42, 3.89, 4.269	3	11.4
165T	2.80	3-1/2	13.3
	3.22, 3.46	3	11.4
	3.73	2-3/4	10.4
	4.00, 4.38, 4.78, 4.96, 5.74	2-1/4	8.5
200T 250T 300Q	2.27	6-1/2	24.6
	2.89	5	18.9
	3.25, 3.36, 3.69	4-1/2	17.1
	4.38, 4.84, 5.63	3-1/2	13.3

2. MAINTENANCE

a. The gear reducer housing is equipped with a magnetic drain plug that will collect any steel particles and prevent them from being recirculated with oil. This plug should be cleaned every six months.

b. The gear reducer should be drained, flushed and refilled every six months or as often as required to maintain clean, sludge-free oil of the proper viscosity.

c. Clean air breather with a non-explosive solvent.

Gear Reducer (Continued)...

II. OVERHAUL AND REPAIR

A. GENERAL

The bearings and other working parts in the plunger pump gear reducers have been designed for continuous duty service; and if proper maintenance is given, will provide years of trouble-free service. If overhaul and repairs are necessary, disassembly and assembly procedures are discussed below.

1. DISASSEMBLY

a. Remove housing cover bolts, and using threaded jackscrew holes, pull the cover and tapered dowel pins.

b. Remove pinion shaft and Timken bearings from housing.

c. Remove blind cover plate.

d. Tap out Timken outer cup and mark all parts for correct replacement position.

e. Pull crankshaft gear. Gear is a .001" to .005" shrink fit to shaft. Puller holes are provided in gear for pulling. (30T - 5/8" holes; 165T and 300Q - 1" holes). Heat should be used when pulling gears, but a combination of dry heat and dry ice can also be used. The puller should be attached to the gear and a heavy strain should be applied. The gear should be heated with a large tip torch starting at the outside gear rim below the root of the teeth, and working in a circular motion, heat the gear slowly and evenly toward the hub. The torch should be kept in constant motion to prevent hot spots. The gear rim should always be kept at a temperature above the hub area to eliminate tensile stresses in the gear rim, which causes the gear to crack. The gear will break loose from the shaft when enough heat has been applied. The puller should then be able to remove the gear. Do not exceed 350°F at any time on the surface of the gear. Use a tempil stick to gauge the temperature.

f. A gear removed in this manner will be a serviceable gear.

! ATTENTION !

EXCESS HEAT OR SPOT HEATING WILL CAUSE THE GEAR TO CRACK OR DISTORT.
ALLOW GEAR TO COOL SLOWLY.

Gear Reducer...

II. OVERHAUL AND REPAIR

A. GENERAL (Continued)...

2. ASSEMBLY

NOTE: Items 1 through 4 may be omitted if the pump is equipped with a new style main bearing cage; 100T & 130T - Part Number 1711617. Omit items 1 through 4 for all 30T, 60T, 80T, 165T, 200T, 250T and 300Q.

a. Remove crankshaft assembly and left hand main bearing and cage assembly as per pump service manual.

b. Install a new cage and bearing per assembly instructions in pump service manual.

c. Install new bearing retainer (100T & 130T - Part number 1711622) and gasket onto cage. Check clearance of Labyrinth seal to shaft. There should <u>not</u> be any metal-to-metal contact.

d. Install crankshaft assembly per instructions in pump service manual.

e. 60T & 80T only - replace left hand bearing retainer, Part Number 1710011, with new bearing retainer, Part Number 1710618, and re-shim crankshaft as per instructions in service manual. This retainer contains labyrinth oil seals, but some older models use two (2) YS-3254 seals with the lips pointed in opposite directions.

f. All other pumps contain labyrinth seal type retainers. No oil seals are necessary. Be sure seal grooves are clean before installing retainer.

g. Apply liquid gasket to bearing cage and install gear reducer housing over pilot on bearing cage. Insert special capscrews and tighten securely.

h. Drill and ream for dowel pins - two (2) holes. Dowel pins are standard .25" per foot taper pins and are listed in the parts list section for each pump.

! ATTENTION !

DO NOT DRILL THROUGH PUMP FRAME. HOLES SHOULD BE REAMED DEEP ENOUGH TO ALLOW PINS TO BE DRIVEN UNTIL THE TOP OF THE TAPER ON PIN IS FROM FLUSH TO 1/8" STAND-OFF.

Gear Reducer...

II. OVERHAUL AND REPAIR

A. GENERAL

2. **ASSEMBLY** (Continued)...

i. After taper pins are fitted and driven, re-check tightness of special capscrews by torquing to following values and wire them in place.

PUMP SIZE	SPECIAL CAPSCREW	TORQUE (Ft. – lbs.)
30T	2402010	75
60T, 80T	2402850	150
100T, 130T	2405029	75
165T	2403190	150
200T, 250T, 300Q	2405018	375

j. Check high-speed pinion for nicks and burrs in bearing areas and remove same.

k. Heat pinion tapered roller assemblies in electric oven or bath to 300°F and install on pinion shaft. Make sure bearings are shouldered on shaft.

l. Install outer race of tapered roller assemblies in housing and cover.

m. With half the shims on the blind retainer, install and secure with screws.

n. Check crankshaft extension, keyway crankshaft gear and key nicks and burrs - remove same.

o. Heat the crankshaft gear to 350°F in an oil bath or furnace to insure even and uniform heating. If these methods are not available, heat the gear with a large top torch as described in paragraph 1. e., page 68. It is of prime importance that the gear be heated slowly and evenly from the gear rim to the hub. Use a tempil stick and micrometers to assure a correct fit. Allow gear to cool slowly.

p. Slip gear on shaft with under cut area on hub facing toward pump; puller holes facing out. Position gear on shaft so that distance from end of shaft to outside face of hub is as follows:

PUMP	END OF SHAFT TO HUB FACE
30T	1-3/4"
60T, 80T	2-5/15"
100T, 130T	4-1/4"
165T	4-3/8"
200T, 250T, 300Q	6-1/2"

q. Insert key with beveled side next to shaft and allow to cool in place.

Gear Reducer...

II. OVERHAUL AND REPAIR

A. GENERAL

2. **ASSEMBLY** (Continued)...

! IMPORTANT !

- MAKE SURE GEAR IS HOT ENOUGH AND INSTALLATION IS PERFORMED QUICKLY ON THE SHAFT BEFORE IT IS POSITIONED.
- MAKE SURE KEYWAYS ARE ALIGNED WHEN SHRINKING GEAR ONTO SHAFT.

r. Position high-speed pinion in housing supporting same with rope or cloth through the hand hole in top of housing.

s. Apply liquid gasket between cover and housing. Install the housing cover and secure with capscrews and taper pins.

t. Place remaining shims on open retainer and install with screws, making certain the drain slot is at the bottom. Adjust with shims and retainers until the endplay of the pinion shaft is from .003" to .005" loose on all reducers except 200T and 300Q where the end play is from .005" to .007" ***loose.*** Check clearance of Labyrinth seal to shaft. There should <u>not</u> be any metal-to metal contact.

! IMPORTANT !

- MAKE CERTAIN THE BEARING OUTER CUPS ARE SOLID AGAINST THE RETAINERS AND THE OUTSIDE RETAINER IS INSTALLED CORRECTLY.

u. Check meshing of pinion and crankshaft gear.

v. Install pinion shaft dirt excluder.

3. **INSTALLATION**

Since the plunger pump gear reducer is attached to the pump and becomes a part of the pump package, the installation should receive the same careful consideration that the pump itself does. Careful installation practices will greatly increase trouble-free operation and reduce maintenance costs. For general installation recommendations, see Installation Section of the pump manual.

P-55U Pump...

A. OPERATING INSTRUCTIONS

1. BOX SUCTION PUMPS (VACUUM FEED)

- Fill reservoir with oil.
- Loosen union nut on pump outlet.
- Remove the vent screw and fill the sight glass with oil. Prime by manually pumping flushing unit until air free oil is observed from the drip tube and oil level drops in the sight glass.
- Replace vent screw and tighten union nut.
- Maintain oil level in sight glass below the drip tube so drops can be observed.

2. FLOW RATE ADJUSTMENT

- Loosen locknut on flushing unit.
- Turn flushing unit counter-clockwise to increase flow.
- Turn flushing unit clockwise to decrease flow.
- Tighten locknut when desired flow rate is achieved.

3. SIGHT GLASS

In a vacuum type sight feed, it is not uncommon for oil level in the sight glass to drop during operation. Absence of a level indicates air is being taken in with the oil. Some oils, due to viscosity conditions, will release air faster than others. When the quality of air becomes excessive, it can eventually air lock the pump.

For this reason it is recommended that an oil level in the sight glass be maintained.

When level drops, remove the vent screw and fill sight glass to top; replace vent screw and operate flushing unit manually, observing that an oil in the sight glass is free from air. If air is not expelled, it may be necessary to loosen union nut (on pump outlet) and expel air at this point. It is desirable to maintain level below the drip tube so drops can be seen during operation.

4. OVERFILLING OF SIGHT GLASS

In a vacuum type sight feed, it is not uncommon to see a reverse action whereas sight glass fills with oil and the drops cannot be observed. Overfilling is caused by oil absorbing air in the sight glass and normally does not affect the operation of the pump. Remove the vent screw from sight glass and allow level to drop below drip tube. Tighten vent screw and check to see that air free oil from drip tube can be observed in the sight glass. If overfilling continues, it may be caused by plunger wear and oil slippage is being drawn back to sight glass. If this is the problem, the feed setting in drops per stroke will then automatically be reduced by the amount of slippage.

5. RESERVOIR OIL LEVEL (LOSS OF PRIME)

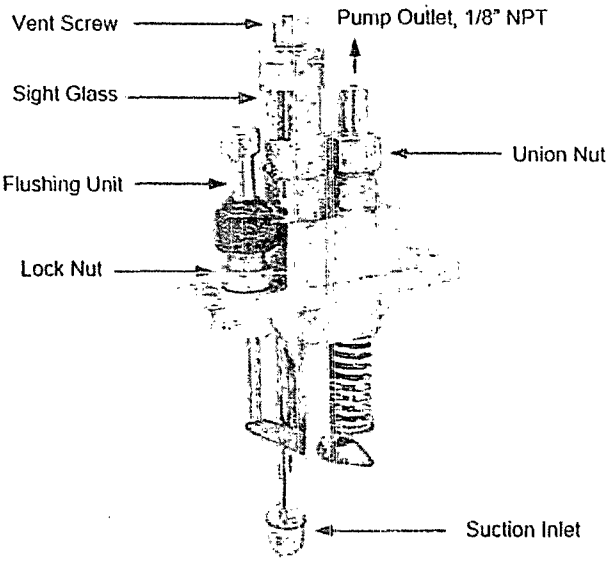
If reservoir runs low on oil (at a point below the suction inlet of the pump) it may be necessary to prime individual pumps after filling, using procedure listed above.

6. PUMP DISPLACEMENT

Maximum output (per stroke):

1/4 Plunger = .018 Cubic Inches
3/8 Plunger = .038 Cubic Inches

The cubic volume for a pint of oil is 28.9 cubic inches and average drop size is .002 cubic inches.



Storage of Pumps...

I. GENERAL

All machinery units require protection from corrosion erosion, natural attrition which causes deterioration of the surface as well as the working parts. Generally, units in operation are frequently inspected, cleaned, painted and lubricated while idle units are often more or less neglected. Any degree of neglect is costly, especially if continued over a sufficient period of time to make restoration of the equipment impossible. It is recommended that preventive measures of protection be established and the following will guide you in the minimum requirement.

A. GENERAL

Preferably, units should be stored in clean, climatically controlled buildings. This would require the minimum inspection, but, since storage in older environments is sometimes necessary, more frequent inspections and additional protection is necessary. The schedule for inspection and protection can be determined only at the point of storage. A protection and storage log is recommended. Tropical areas require the maximum protection; arid regions require the least amount of protection. The frequency of inspection is determined after noting the rate of deterioration. Take positive action immediately when corrosion/erosion appears, do not wait until large areas are covered because usually the larger the area, the deeper the penetration.

B. RECOMMENDED PROTECTION INITIAL STORAGE

1. Drain all oil and thoroughly clean inside of Power Frame.
2. Coat pinion shaft oil seals with grease.
3. Remove breathers for later installation on pump. Seal all breather holes with greased solid pipe plugs. Remove extension rods and diaphragm sealing housing; be sure to protect the rods and housings, storing them separately for later installation on the pump. Seal diaphragms with wooden covers. "Mate" the wood cover and diaphragm faces together, thoroughly coating with Rust Veto 342 or its equivalent.
4. Spray two gallons of Shell VSI 100 vapor phase inhibitor or equivalent into power end of pump.
5. Remove valves and valve springs. Clean and wrap in corrosion inhibiting paper. Remove liners and pistons. Clean and wrap in corrosion inhibiting paper. Clean and dry fluid end bores and thoroughly coat all internal surfaces with Tectyl 506 or equivalent.
6. Thoroughly coat all threads and end of valve cover and screw into fluid end.
7. Protect all external machine surfaces using Rust Veto 342 or equivalent including pump pads.
8. Inspect complete pump and record all details on the Protection and Storage Log.

Storage of Pumps...

I. GENERAL (Continued)...

C. SIX MONTH SERVICING

1. Rotate pump.
2. Renew internal rust inhibitors to specifications and quantities previously stated under the "Initial Storage" section.
3. Before replacing top and side covers, inspect for any internal corrosion.
4. Inspect for soundness of external protection, i.e., rust preventative and paint. Renew as necessary.
5. Enter and record all details on the "Protection and Storage Log".

D. PRE-INSTALLATION CHECK AFTER STORAGE

1. Repeat six month servicing procedure as stated above.
2. Ensure all necessary parts are complete and in a satisfactory condition for installation on pump.
3. Enter all records and close out the "Protection and Storage Log".

Owners Record...

NAME _____

LOCATION _____

DATE OF DELIVERY _____ DATE PLACED IN OPERATION _____

PUMP MODEL _____

PUMP SIZE _____ SERIAL NO. _____

PRIME MOVER _____ SERIAL NO. _____

GEAR UNIT _____ SERIAL NO. _____

DRIVE:

DRIVE SHEAVE P.D. _____ DRIVEN SHEAVE P.D. _____ NO. OF GROOVES _____

BELT LENGTH _____ DRIVE SPROCKET _____ CHAIN SIZE _____

CHAIN LENGTH _____ COUPLING (MAKE) _____ COUPLING SIZE _____

PRESSURE _____ VOLUME _____ PUMP SPEED _____ DRIVE SPEED _____

PLUNGERS _____

PACKING _____

PISTONS _____

LINERS _____

VALVES _____

SEATS _____

LUBRICANTS:

CRANK CASE _____

FLUSHING SYSTEM _____

GEAR UNIT _____

LUBRICATOR _____

PRIME MOVER _____

COUPLING _____

NOTES _____

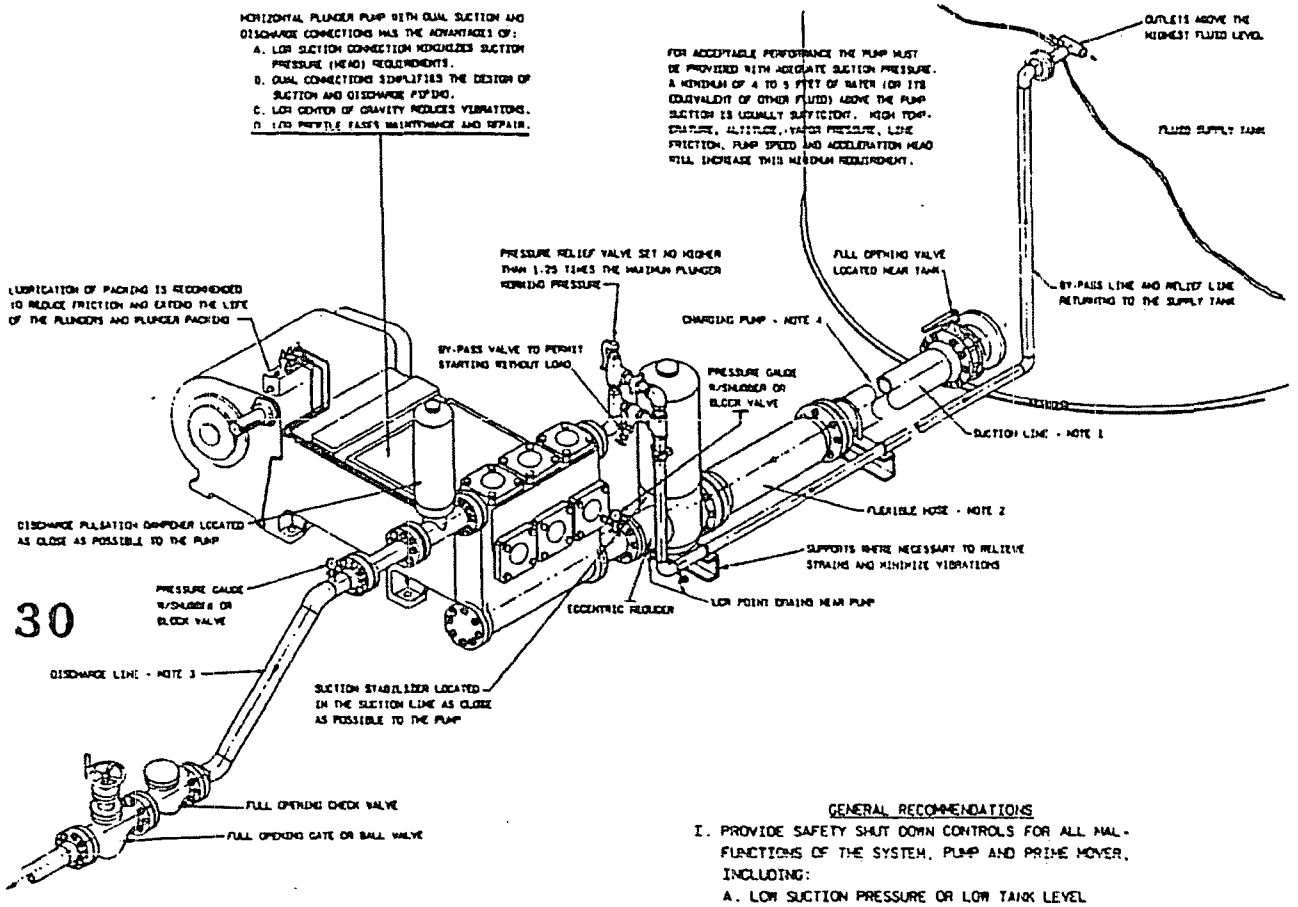
_____

_____

_____

All of the above entries are not applicable to a specific unit; therefore, completion of this form must be confined within the limits of each pump and the specified optional accessory equipment.

Typical Waterflood Pump Installation Suction and Discharge Piping Arrangement...



NOTES

1. A SEPARATE SUCTION LINE IS RECOMMENDED FOR EACH PUMP. THE LINE SHOULD BE A MINIMUM OF ONE SIZE LARGER THAN THE PUMP SUCTION FLANGE OR OPENING TO PROVIDE A MAXIMUM OF 1 TO 2 FEET/SECOND FLUID VELOCITY. IF BENDS ARE NECESSARY USE ONLY 45° LONG RADIUS ELLS. A SLOPE OF 1/4" PER FOOT FROM TANK TO PUMP IS RECOMMENDED.
2. A FLEXIBLE HOSE AND/OR EXPANSION JOINT IN THE SUCTION LINE (ALSO DISCHARGE LINE) PROVIDES FOR THERMAL EXPANSION AND TENDS TO DAMPEN VIBRATIONS.
3. DIRECT THE DISCHARGE LINE, USING 45° LONG RADIUS ELLS, TO GRADE OR BELOW GRADE LEVEL AS SOON AS POSSIBLE TO RELIEVE STRAIN AND REDUCE VIBRATIONS. THE LINE SIZE SHOULD BE SUFFICIENT NOT TO EXCEED A MAXIMUM FLUID VELOCITY OF 8 TO 10 FEET/SECOND.
4. IF CHARGING PUMP IS USED IT SHOULD BE LOCATED NEAR THE SUPPLY TANK. IN ITS SELECTION GIVE CONSIDERATION TO THE FLUID PUMPED, VELOCITY, PLUNGER PUMP VALVING, LINE FRICTION, ETC. SIZE CHARGE PUMP TO 1-1/2 TIMES *RECIPROCATING* PUMP VOLUME CAPACITY, MINIMUM.

GENERAL RECOMMENDATIONS

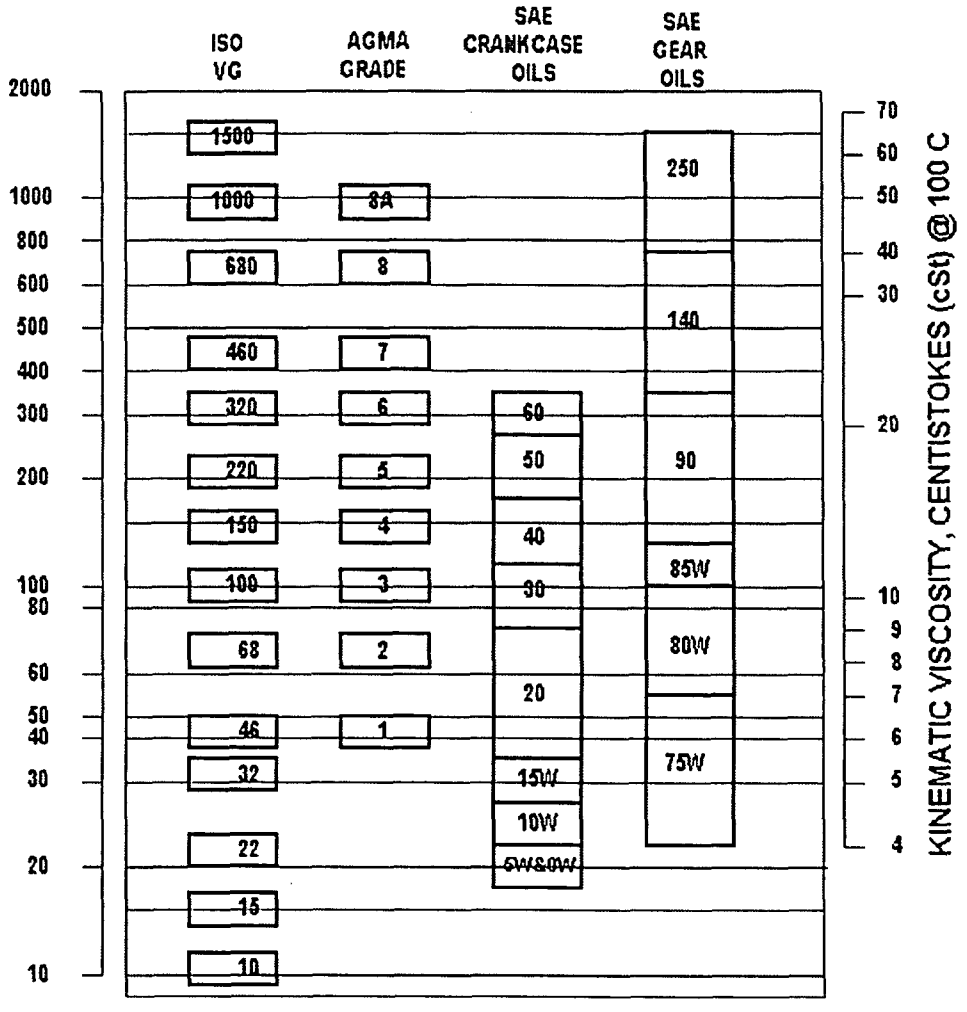
I. PROVIDE SAFETY SHUT DOWN CONTROLS FOR ALL MALFUNCTIONS OF THE SYSTEM, PUMP AND PRIME MOVER, INCLUDING:
   A. LOW SUCTION PRESSURE OR LOW TANK LEVEL
   B. LOW DISCHARGE PRESSURE
   C. HIGH DISCHARGE PRESSURE
   D. LOW OIL PRESSURE OR LOW OIL LEVEL
   E. HIGH TEMPERATURE, EXCESSIVE VIBRATIONS, OVERLOADING OF PRIME MOVER, ETC.

II. FOR SERVICING AND SAFETY PROVIDE ADEQUATE WORK AREA AROUND THE PUMP UNIT.

III. CARE AND OPERATIONS SHOULD INCLUDE CLEANLINESS, DAILY INSPECTIONS, PERIODIC INSPECTIONS, ROUTINE MAINTENANCE AND PREVENTIVE MAINTENANCE.

ISSUE DATE:			
NATIONAL - OILWELL			
TYPICAL WATERFLOOD PUMP INSTALLATION SUCTION & DISCHARGE PIPING ARRANGEMENT			
	SIZE C	DRAWING NO. GSK-3886P	REV

Viscosity Equivalents...

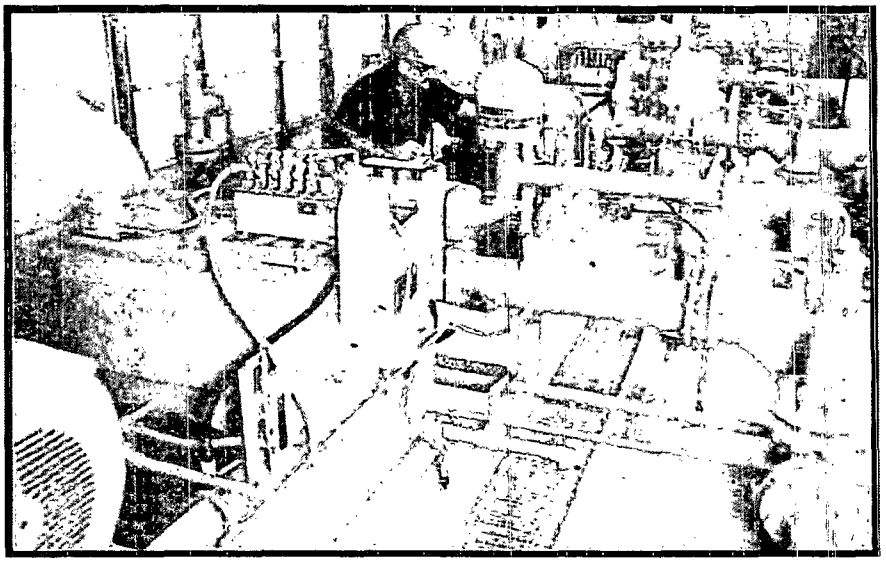


NOTES:

*Assumes 100 VI single grade oils. Read across horizontally.
*SAE grades based upon viscosity at 100 C. ISO and AGMA grades based upon viscosity at 40 C
*Equivalence is in terms only of viscosity. Quality requirements are a separate consideration.
*Viscosity limits are approximate: For precise data, consult ISO, AGMA and SAE specifications.
*W grades define only in terms of 100 C viscosity. For low temperature limits, consult SAE specifications.

*ISO = International Standardization Organization
*AGMA = American Gear Manufacturers Association
*SAE = Society of Automotive Engineers

NATIONAL OILWELL VARCO



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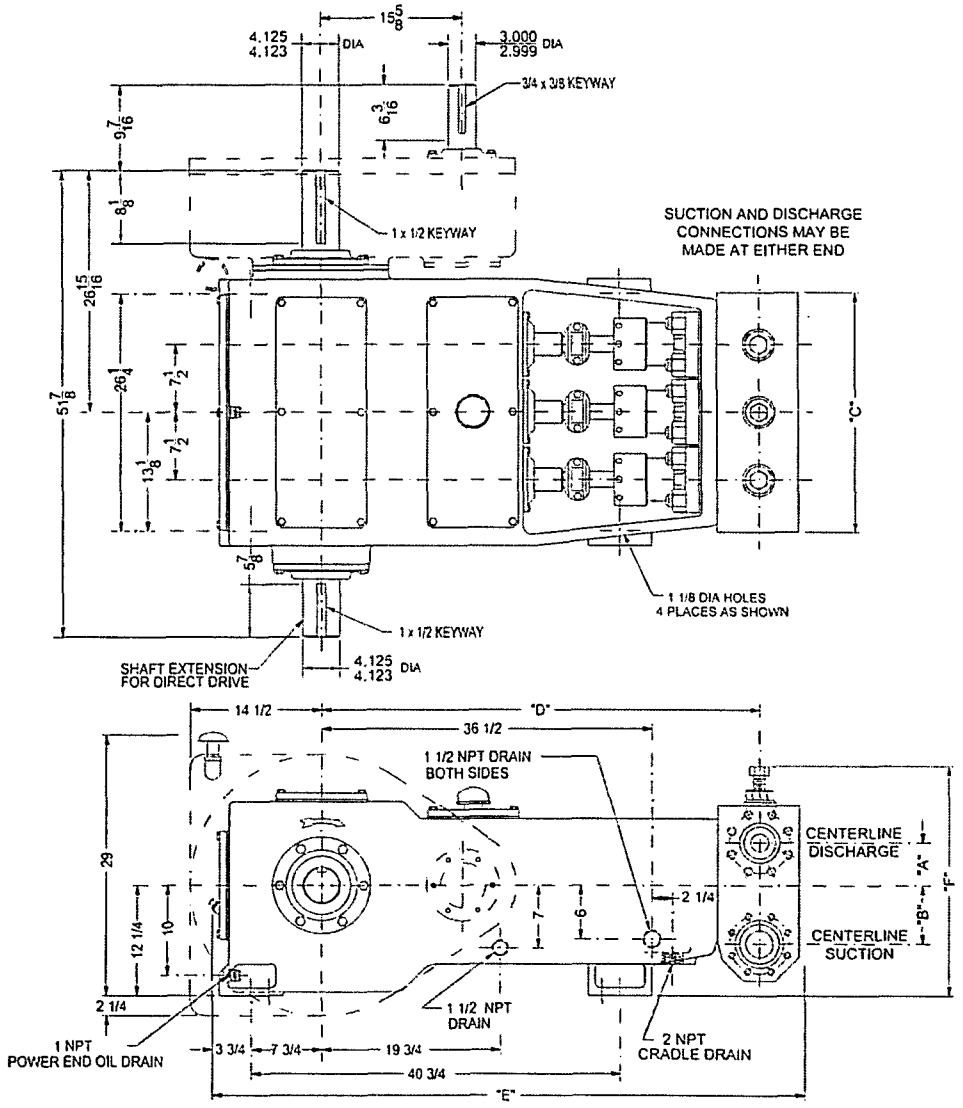
National Oilwell Varco is a leading manufacturer of reciprocating plunger pumps, Mission Fluid King centrifugal pumps, and fluid end replacement parts. We also offer a complete set of solutions to your fluid transfer challenges. For more Information, contact National Oilwell Varco directly at the Headquarters in Houston, Texas. All National Oilwell Varco products are available throughout the U.S. and around the world from service centers, authorized distributors, and representatives.

165T-5 Triplex Plunger Pump



Specifications

Pump Size
(maximum plunger size x stroke length in.(mm)
4 x 5 (102 x 127)

Rated bhp at 400 rpm (kw)
165 (123)

Rated plunger load, pounds (Kg)
9800 (4445.2)

Maximum discharge pressure: psi (kPa)
"L" model: 1650 (11,376)
"M" model: 3120 (21,512)
"H" model: 5000 (34,474)

Crankshaft extension: in.(mm)
Diameter: 4.125 (104.8)
Length long side: 8 1/8 (206.4)
Length short side: 5 7/8 (149.2)
Keyway (width x depth): 1 x 1/2 (25.4 x 12.7)
Maximum recommended sheave in.(mm):
50 (1270)
Minimum recommended sheave in.(mm):
36 (914)
For larger sizes: **Contact Factory**

Pinion shaft extension, in.(mm):
if gear reducer is supplied
For belt or chain drive: **Contact Factory**
For direct drive: Diameter: 3.0 (76.2)
Length: 6 3/16 (157.2)
Keyway (width x depth):
3/4 x 3/8 (19.05 x 9.53)

Accessory gear reduction unit:
2.8:1, 3.22:1, 3.46:1, 4.00:1,
4.38:1, 4.78:1, 4.96:1, 5.74:1

Oil Capacity, gallons (L)
Crankcase: 8 (30)
Gear Reducer-varies with ratio:
2.25 to 3.5 (8.52 to 13.25)

Weight, pump only on wood shipping skids
pounds (Kg): 4000 (1814)
Gear reducer, approximate pounds (Kg):
800 (363)

Pump Model	Flange Connections		Dimensions (Inches)					
	Discharge Connection Sizes	Suction Connection Sizes	A	B	C	D	E	F
165-5L	3 (76.2) API-2000 RJ	6 (152.4) ANSI-150 FF	5 11/16	7 5/8	27 3/4	48 3/4	65 3/4	23
165-5M	2 (50.8) API-5000 RJ	4 (101.6) ANSI-150 FF	4 3/4	6 1/2	26 1/2	48 3/8	64 7/8	25 5/16
165-5H	2 (50.8) ANSI-2500 RJ	3 (76.2) API-2000 RJ	4 3/4	6 1/2	26 1/2	48 3/8	64 1/4	25 5/16

165T-5 Triplex Plunger Pump

Performance Data

PUMP	English Units					100 RPM		200 RPM		250 RPM		300 RPM		350 RPM		400 RPM	
	Plunger Dia. In.	Plunger Area Sq. In.	BPD per RPM	GPM per RPM	Max. Press. PSI	BPD	GPM	BPD	GPM	BPD	GPM	BPD	GPM	BPD	GPM	BPD	GPM
165T-5L	4.000	12.5664	27.9770	0.8160	780	2798	81.6	5596	163.2	6995	204.0	8394	244.8	9792	285.6	11191*	326*
	3.750	11.0447	24.5892	0.7172	887	2459	71.7	4918	143.4	6148	179.3	7377	215.2	8607	251.0	9836	286.9
	3.500	9.6211	21.4199	0.6247	1019	2142	62.5	4284	124.9	5355	156.2	6426	187.4	7497	218.7	8568	249.9
	3.250	8.2958	18.4692	0.5387	1181	1847	53.9	3694	107.7	4618	134.7	5541	161.6	6465	188.5	7388	215.5
	3.000	7.0686	15.7371	0.4590	1386	1574	45.9	3148	91.8	3935	114.7	4722	137.7	5508	160.6	6295	183.6
	2.750	5.9396	13.2235	0.3857	1650	1323	38.6	2645	77.1	3306	96.4	3968	115.7	4629	135.0	5290	154.3
165T-5M	2.750	5.9396	13.2235	0.3857	1650	1323	38.6	2645	77.1	3306	96.4	3968	115.7	4629	135.0	5290	154.3
	2.500	4.9087	10.9285	0.3187	1996	1093	31.9	2186	63.7	2733	79.7	3279	95.6	3825	111.6	4372	127.5
	2.375	4.4301	9.8630	0.2877	2212	987	28.8	1973	57.5	2466	71.9	2959	86.3	3453	100.7	3946	115.1
	2.250	3.9761	8.8521	0.2582	2465	886	25.8	1771	51.6	2214	64.5	2656	77.5	3099	90.4	3541	103.3
	2.125	3.5466	7.8959	0.2303	2763	790	23.0	1580	46.1	1974	57.6	2369	69.1	2764	80.6	3159	92.1
	2.000	3.1416	6.9943	0.2040	3120	700	20.4	1399	40.8	1749	51.0	2099	61.2	2448	71.4	2798	81.6
165T-5H	2.000	3.1416	6.9943	0.2040	3120	700	20.4	1399	40.8	1749	51.0	2099	61.2	2448	71.4	2798	81.6
	1.875	2.7612	6.1473	0.1793	3549	615	17.9	1230	35.9	1537	44.8	1845	53.8	2152	62.8	2459	71.7
	1.750	2.4053	5.3550	0.1562	4074	536	15.6	1071	31.2	1339	39.0	1607	46.9	1875	54.7	2142	62.5
	1.625	2.0739	4.6173	0.1347	4725	462	13.5	924	26.9	1155	33.7	1386	40.4	1617	47.1	1847	53.9
	1.500	1.7671	3.9343	0.1147	5000	394	11.5	787	22.9	984	28.7	1181	34.4	1377	40.2	1574	45.9
	Brake Horsepower Required					42		83		104		124		144		165	

PUMP	Metric Units					100 RPM		200 RPM		250 RPM		300 RPM		350 RPM		400 RPM	
	Plunger Dia. mm	Plunger Area cm^2	M^3/Hr per RPM	L/Sec. per RPM	Max. Press. kPa	M^3/Hr	L/Sec.	M^3/Hr	L/Sec.	M^3/Hr	L/Sec.	M^3/Hr	L/Sec.	M^3/Hr	L/Sec.	M^3/Hr	L/Sec.
165T-5L	102	81.073	0.1853	0.0515	5377	18.5	5.1	37.1	10.3	46.3	12.9	55.6	15.4	64.9	18.0	74.1*	20.6*
	95	71.256	0.1629	0.0452	6118	16.3	4.5	32.6	9.0	40.7	11.3	48.9	13.6	57.0	15.8	65.1	18.1
	89	62.072	0.1419	0.0394	7023	14.2	3.9	28.4	7.9	35.5	9.9	42.6	11.8	49.7	13.8	56.8	15.8
	83	53.521	0.1223	0.0340	8145	12.2	3.4	24.5	6.8	30.6	8.5	36.7	10.2	42.8	11.9	48.9	13.6
	76	45.604	0.1042	0.0290	9559	10.4	2.9	20.8	5.8	26.1	7.2	31.3	8.7	36.5	10.1	41.7	11.6
	70	38.320	0.0876	0.0243	11376	8.8	2.4	17.5	4.9	21.9	6.1	26.3	7.3	30.7	8.5	35.0	9.7
165T-5M	70	38.320	0.0876	0.0243	11376	8.8	2.4	17.5	4.9	21.9	6.1	26.3	7.3	30.7	8.5	35.0	9.7
	64	31.669	0.0724	0.0201	13765	7.2	2.0	14.5	4.0	18.1	5.0	21.7	6.0	25.3	7.0	29.0	8.0
	60	28.581	0.0653	0.0181	15252	6.5	1.8	13.1	3.6	16.3	4.5	19.6	5.4	22.9	6.4	26.1	7.3
	57	25.652	0.0586	0.0163	16994	5.9	1.6	11.7	3.3	14.7	4.1	17.6	4.9	20.5	5.7	23.5	6.5
	54	22.881	0.0523	0.0145	19052	5.2	1.5	10.5	2.9	13.1	3.6	15.7	4.4	18.3	5.1	20.9	5.8
	51	20.268	0.0463	0.0129	21512	4.6	1.3	9.3	2.6	11.6	3.2	13.9	3.9	16.2	4.5	18.5	5.1
165T-5H	51	20.268	0.0463	0.0129	21512	4.6	1.3	9.3	2.6	11.6	3.2	13.9	3.9	16.2	4.5	18.5	5.1
	48	17.814	0.0407	0.0113	24471	4.1	1.1	8.1	2.3	10.2	2.8	12.2	3.4	14.3	4.0	16.3	4.5
	44	15.518	0.0355	0.0099	28092	3.5	1.0	7.1	2.0	8.9	2.5	10.6	3.0	12.4	3.4	14.2	3.9
	41	13.380	0.0306	0.0085	32580	3.1	0.8	6.1	1.7	7.6	2.1	9.2	2.5	10.7	3.0	12.2	3.4
	38	11.401	0.0261	0.0072	34474	2.6	0.7	5.2	1.4	6.5	1.8	7.8	2.2	9.1	2.5	10.4	2.9
	Kilowatts Required					31		62		78		92		108		123	

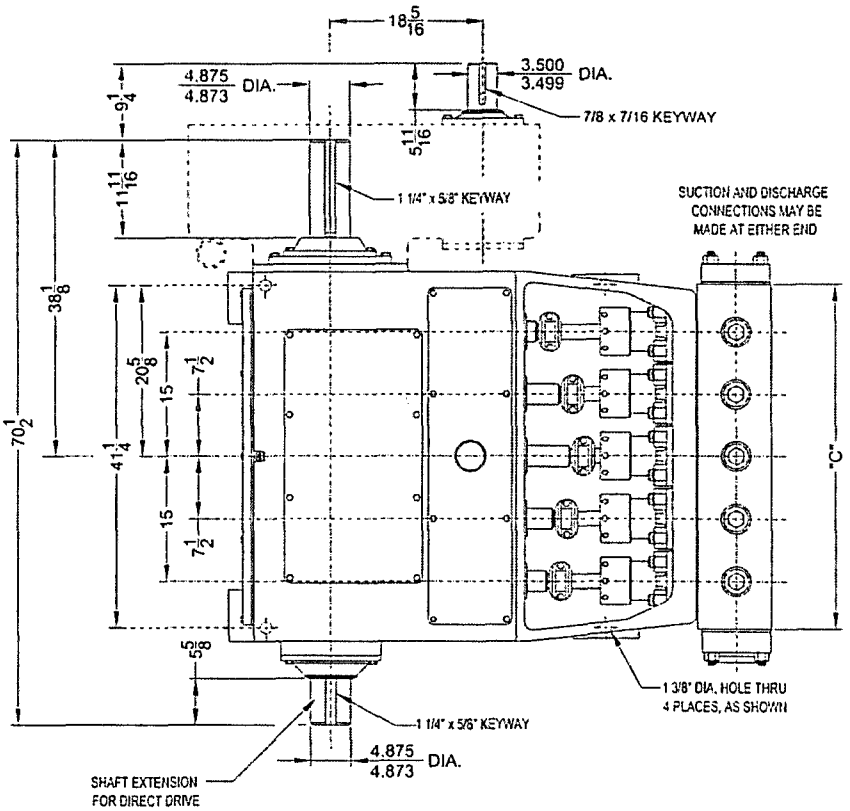
Volumetric Rate is based on 100% Volumetric Efficiency. Brake Horsepower/Kilowatts Required is based on 90% Mechanical Efficiency. For Operation below 200 RPM, an auxiliary lubrication system is required. Not all plunger sizes are shown. Contact National-Oilwell for additional information. *Spherical Valves must be installed when the pump is fitted with 4.0" (102mm) plungers

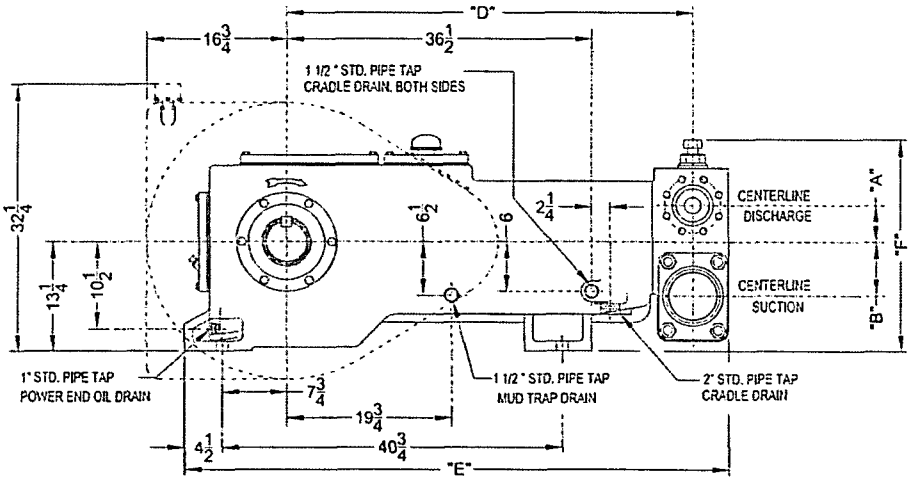
Authorized Distributor:

NATIONAL OILWELL VARCO

www.nov.com • mission.sales@nov.com
10000 Richmond, Houston, Texas 77042
(713)346-7500 (phone) • (713)346-7366 (fax)

300Q-5 Quintuplex Plunger Pump





Specifications

Pump Size
maximum plunger size x stroke length, in.(mm):
4 x 5 (102 x 127)
Rated bhp at 400 rpm (kw): 300 (224)
Rated plunger load, pounds(Kg): 10,700(4853.5)
Maximum discharge pressure: psi(kPa)
"L" model: 1650 (11,375)
"M" model: 3000 (20,682)
"H" model: 5000 (34,470)
Crankshaft extension: in.(mm)
Diameter: 4.875 (123.8)
Length long side: 11 11/16 (297)
Length short side: 5 5/8 (143)
Keyway (width x depth):
1 1/4 x 5/8 (32 x 16)
Maximum recommended sheave in.(mm): 58 (1473)
Minimum recommended sheave in.(mm): 36 (914)
For larger sizes: **Contact Factory**
Pinion shaft extension,
if gear reducer is supplied, in.(mm)
For belt or chain drive:
Contact Factory
For direct drive: Diameter: 3.5 (88.9)
Length: 5 11/16 (145)
Keyway (width x depth):
7/8 x 7/16 (22.2 x 11.1)
Accessory gear reduction unit:
2.27:1, 2.89:1, 3.25:1, 3.36:1, 3.69:1, 4.38:1, 4.84:1, 5.63:1
Oil Capacity, gallons (L)
Crankcase: 12 (45.5)
Gear Reducer-varies with ratio:
3.5 to 6.5 (13.2 to 24.6)
Weight, pump only on wood shipping skids, pounds (Kg)
"L": 7000 (3175)
"M": 6750 (3062)
"H": 6840 (3103)
Gear reducer, approximate, pounds (Kg):
1100 (499)

Pump Model	Flange Connections		Dimensions in inches (mm)					
	Discharge Connection Sizes	Suction Connection Sizes	A	B	C	D	E	F
300Q-5L	4 (101.6) API 2000 RJ	8 (203.2) ANSI 150 FF	6 1/4	9 1/8	43 1/4	49	68	25 1/8
300Q-5M	3 (76.2) NSD 5000 RJ	6 (152.4) NSD 600 RJ	4 1/2	6 1/2	41 1/2	48 5/8	65	25 7/16
300Q-5H	2 (50.8) ANSI 2500 RJ	6 (152.4) NSD 600 RJ	4 1/2	6 1/2	41 1/2	48 5/8	65 1/8	25 5/8

300Q-5 Quintuplex Plunger Pump

Performance Data

PUMP	English Units					100 RPM		200 RPM		250 RPM		300 RPM		350 RPM		400 RPM	
	Plunger Dia. In.	Plunger Area Sq. In.	BPD per RPM	GPM per RPM	Max. Press. PSI	BPD	GPM	BPD	GPM	BPD	GPM	BPD	GPM	BPD	GPM	BPD	GPM
3000-5L	4.000	12.5664	46.6284	1.3600	851	4663	136.0	9326	272.0	11658	340.0	13989	408.0	16320	476.0	18652	544.0
	3.750	11.0447	40.9820	1.1953	969	4099	119.5	8197	239.1	10246	298.8	12295	358.6	14344	418.4	16393	478.1
	3.500	9.6211	35.6999	1.0412	1112	3570	104.1	7140	208.2	8925	260.3	10710	312.4	12495	364.4	14280	416.5
	3.250	8.2958	30.7820	0.8978	1290	3079	89.8	6157	179.6	7696	224.5	9235	269.3	10774	314.2	12313	359.1
	3.000	7.0686	26.2285	0.7650	1514	2623	76.5	5246	153.0	6558	191.2	7869	229.5	9180	267.7	10492	306.0
	2.750	5.9396	22.0392	0.6428	1650	2204	64.3	4408	128.6	5510	160.7	6612	192.8	7714	225.0	8816	257.1
3000-5M	2.750	5.9396	22.0392	0.6428	1801	2204	64.3	4408	128.6	5510	160.7	6612	192.8	7714	225.0	8816	257.1
	2.500	4.9087	18.2142	0.5312	2180	1822	53.1	3643	106.2	4554	132.8	5465	159.4	6375	185.9	7286	212.5
	2.375	4.4301	16.4383	0.4795	2415	1644	47.9	3288	95.9	4110	119.9	4932	143.8	5754	167.8	6576	191.8
	2.250	3.9761	14.7535	0.4303	2691	1476	43.0	2951	86.1	3689	107.6	4427	129.1	5164	150.6	5902	172.1
	2.125	3.5466	13.1598	0.3838	3000	1316	38.4	2632	76.8	3290	96.0	3948	115.1	4606	134.3	5264	153.5
	2.000	3.1416	11.6571	0.3400	3000	1166	34.0	2332	68.0	2915	85.0	3498	102.0	4080	119.0	4663	136.0
3000-5H	2.000	3.1416	11.6571	0.3400	3406	1166	34.0	2332	68.0	2915	85.0	3498	102.0	4080	119.0	4663	136.0
	1.875	2.7612	10.2455	0.2988	3875	1025	29.9	2050	59.8	2562	74.7	3074	89.6	3586	104.6	4099	119.5
	1.750	2.4053	8.9250	0.2603	4449	893	26.0	1785	52.1	2232	65.1	2678	78.1	3124	91.1	3570	104.1
	1.625	2.0739	7.6955	0.2245	5000	770	22.4	1540	44.9	1924	56.1	2309	67.3	2694	78.6	3079	89.8
	1.500	1.7671	6.5571	0.1912	5000	656	19.1	1312	38.2	1640	47.8	1968	57.4	2295	66.9	2623	76.5
	Brake Horsepower Required					76		151		188		225		263		300	

PUMP	Metric Units					100 RPM		200 RPM		250 RPM		300 RPM		350 RPM		400 RPM	
	Plunger Dia. mm	Plunger Area cm^2	M^3/Hr per RPM	L/Sec. per RPM	Max. Press. kPa	M^3/Hr	L/Sec.	M^3/Hr	L/Sec.	M^3/Hr	L/Sec.	M^3/Hr	L/Sec.	M^3/Hr	L/Sec.	M^3/Hr	L/Sec.
3000-5L	102	81.073	0.3089	0.0858	5871	30.9	8.6	61.8	17.2	77.2	21.5	92.7	25.7	108.1	30.0	123.5	34.3
	95	71.256	0.2715	0.0754	6680	27.1	7.5	54.3	15.1	67.9	18.9	81.4	22.6	95.0	26.4	108.6	30.2
	89	62.072	0.2365	0.0657	7668	23.6	6.6	47.3	13.1	59.1	16.4	70.9	19.7	82.8	23.0	94.6	26.3
	83	53.521	0.2039	0.0566	8893	20.4	5.7	40.8	11.3	51.0	14.2	61.2	17.0	71.4	19.8	81.6	22.7
	76	45.604	0.1737	0.0483	10437	17.4	4.8	34.7	9.7	43.4	12.1	52.1	14.5	60.8	16.9	69.5	19.3
	70	38.320	0.1460	0.0406	11376	14.6	4.1	29.2	8.1	36.5	10.1	43.8	12.2	51.1	14.2	58.4	16.2
3000-5M	70	38.320	0.1460	0.0406	12421	14.6	4.1	29.2	8.1	36.5	10.1	43.8	12.2	51.1	14.2	58.4	16.2
	64	31.669	0.1206	0.0335	15029	12.1	3.4	24.1	6.7	30.2	8.4	36.2	10.1	42.2	11.7	48.3	13.4
	60	28.581	0.1089	0.0302	16653	10.9	3.0	21.8	6.0	27.2	7.6	32.7	9.1	38.1	10.6	43.6	12.1
	57	25.652	0.0977	0.0271	18555	9.8	2.7	19.5	5.4	24.4	6.8	29.3	8.1	34.2	9.5	39.1	10.9
	54	22.881	0.0872	0.0242	20684	8.7	2.4	17.4	4.8	21.8	6.1	26.2	7.3	30.5	8.5	34.9	9.7
	51	20.268	0.0772	0.0215	20684	7.7	2.1	15.4	4.3	19.3	5.4	23.2	6.4	27.0	7.5	30.9	8.6
3000-5H	51	20.268	0.0772	0.0215	23483	7.7	2.1	15.4	4.3	19.3	5.4	23.2	6.4	27.0	7.5	30.9	8.6
	48	17.814	0.0679	0.0189	26719	6.8	1.9	13.6	3.8	17.0	4.7	20.4	5.7	23.8	6.6	27.1	7.5
	44	15.518	0.0591	0.0164	30672	5.9	1.6	11.8	3.3	14.8	4.1	17.7	4.9	20.7	5.7	23.6	6.6
	41	13.380	0.0510	0.0142	34474	5.1	1.4	10.2	2.8	12.7	3.5	15.3	4.2	17.8	5.0	20.4	5.7
	38	11.401	0.0434	0.0121	34474	4.3	1.2	8.7	2.4	10.9	3.0	13.0	3.6	15.2	4.2	17.4	4.8
	Kilowatts Required					57		113		140		168		196		224	

Volumetric Rate is based on 100% Volumetric Efficiency. Brake Horsepower/Kilowatts Required is based on 90% Mechanical Efficiency. For Operation below 100 RPM, an auxiliary lubrication system is required. Not all plunger sizes are shown. Contact National-Oilwell for additional information. Spherical Valves must be installed when the pump is fitted with 4.0" (102mm) plungers.

Authorized Distributor:

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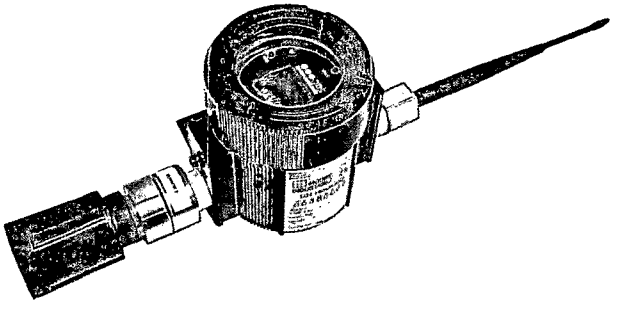
WireFree

Model OI-WF690 Sensor Assembly



Operation Manual

OTIS
INSTRUMENTS INC.

Product Overview

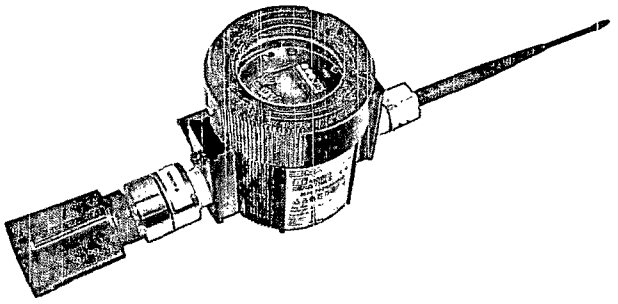
The Otis Instruments, Inc. WireFree Model OI-WF690 Sensor Assembly is an innovative wireless gas detection system designed to monitor gas in hostile environments without the use of wires or conduit from the controller to the sensor.

The OI-WF690 Sensor Assembly's key feature is non-intrusive calibration and configuration. With all adjustments made at the sensor assembly, one-man non-intrusive calibration is quick, easy, and allows the device to remain Class I, Division 1, Group C and D certified while in the field. Non-intrusive calibration is made possible by using an Otis Instruments, Inc. distributed magnet to activate the *MENU*, *ADD*, and *SUB* buttons.

The device is self-contained and battery operated. The sensor functions by transmission of radio wave messages to the OI-WF784 or OI-WF752 (or any receiving controller) every minute when there is no gas present, and every five seconds when gas is present (and above the background gas level setting).

The device is field adjustable for background gas, and addressable to eliminate interference with other systems. Since each system's address is field adjustable, any OI-WF690 sensor may be used as a replacement.

Features such as the auto-setting Null, relay/alarm tests and battery voltage indication make this device a truly remarkable gas detection system.



Note: Before powering on, make certain that the device is in clear air. To ensure a clean air environment, either power-on the device from an off site location or use a calibration cup attached to a clean air supply bottle.

Table of Contents

Introduction

This document is an Operation Manual containing diagrams and step-by-step instruction for proper operation of the Otis Instruments, Inc. WireFree Model OI-WF690 Sensor Assembly. This document should be read before initial operation of the product.

Should a question arise during the use of the product, this document will serve as a first reference for consultation. If further questions arise, or if the device is not working properly, please contact the sales representative of this product.

Warnings

- **Before powering on, make certain that the device is in clear air. To assure a clean air environment, either power-on the device from an off site location or use a calibration cup attached to a clean air supply bottle.**

- Do not open the enclosure when the device is energized.

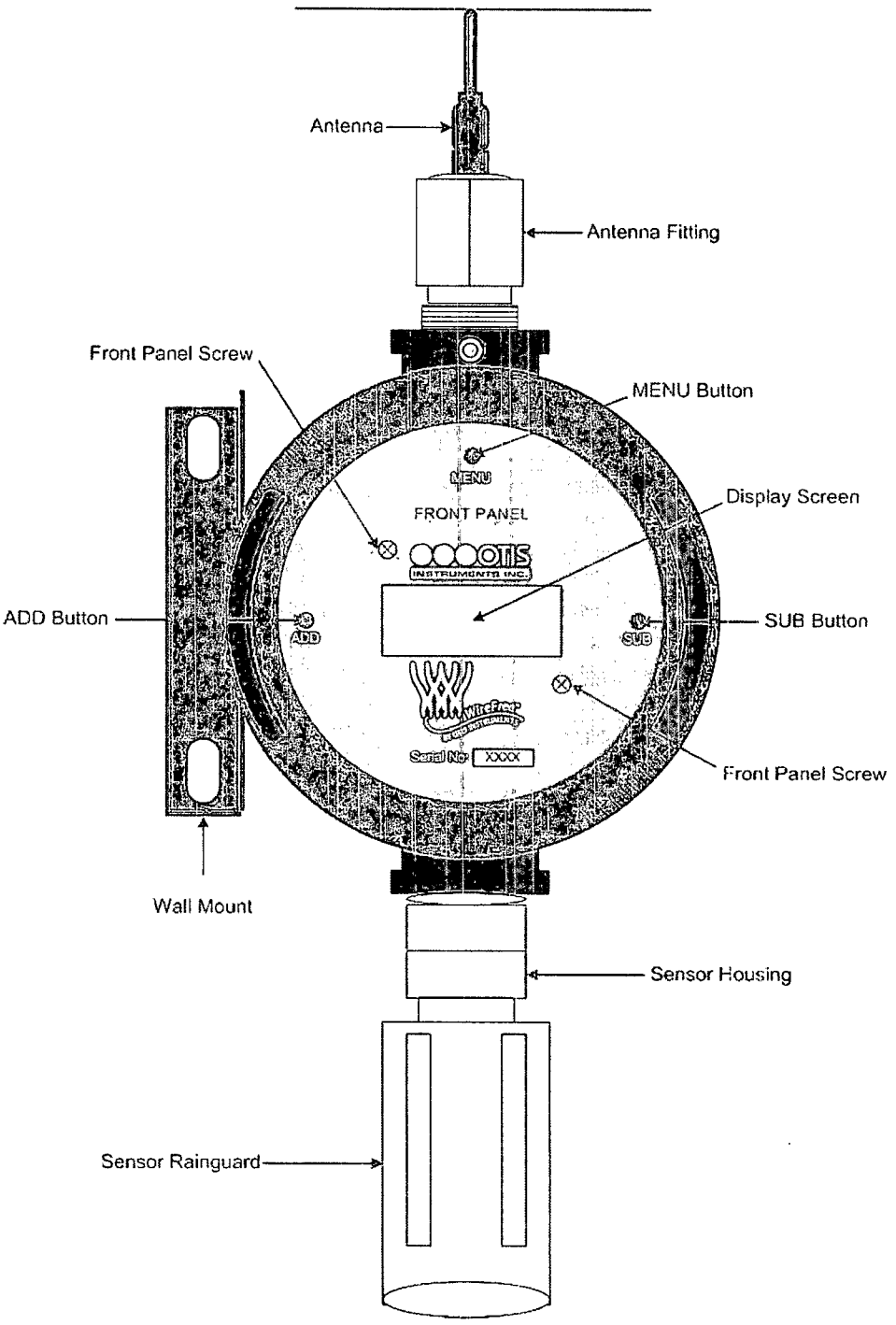
- Do not open the enclosure if an explosive gas atmosphere may be present.

- The Otis Instruments WireFree OI-WF690 Sensor Assembly is Class I Division I Certified. The assembly is able to maintain its certification at all times while in the field, simply by using the non-intrusive calibration method which requires the use of an Otis Instruments, Inc. distributed magnet. However, if the Moore lid is removed, for whatever reason, the OI-WF690 certification is not valid. To avoid invalidating the certification, once in the device is put in the field, always use the Otis Instruments, Inc. distributed magnet to ensure non-intrusive calibration.

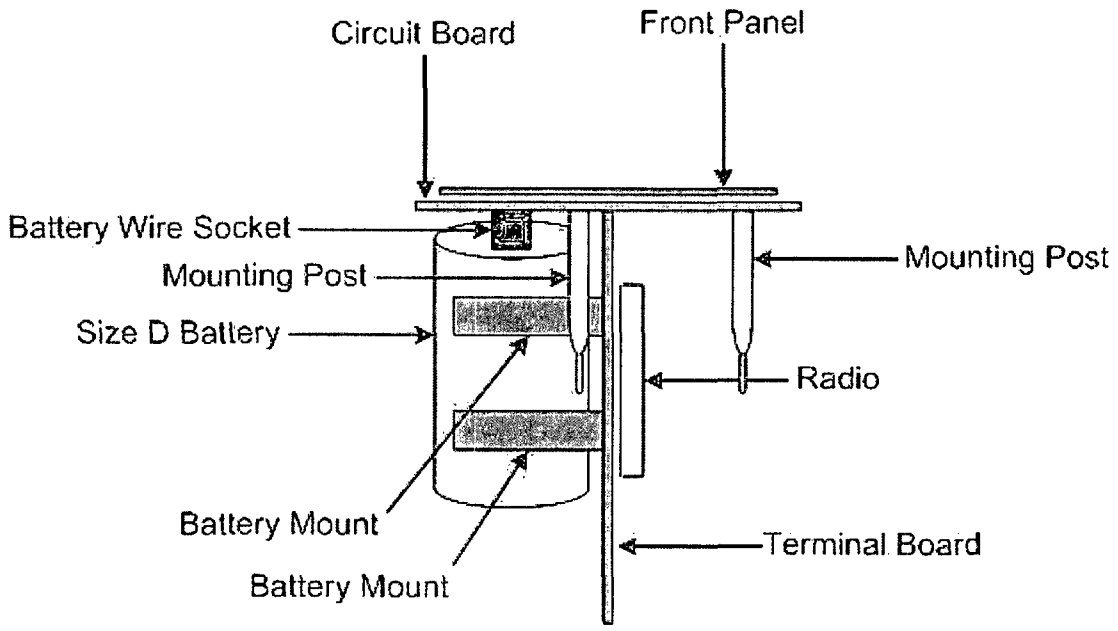
Complete System Diagram

The following diagrams should be consulted for identification of the system and all parts that may be referred to in this Operation Manual.

Complete System (External)



Complete System (Internal)

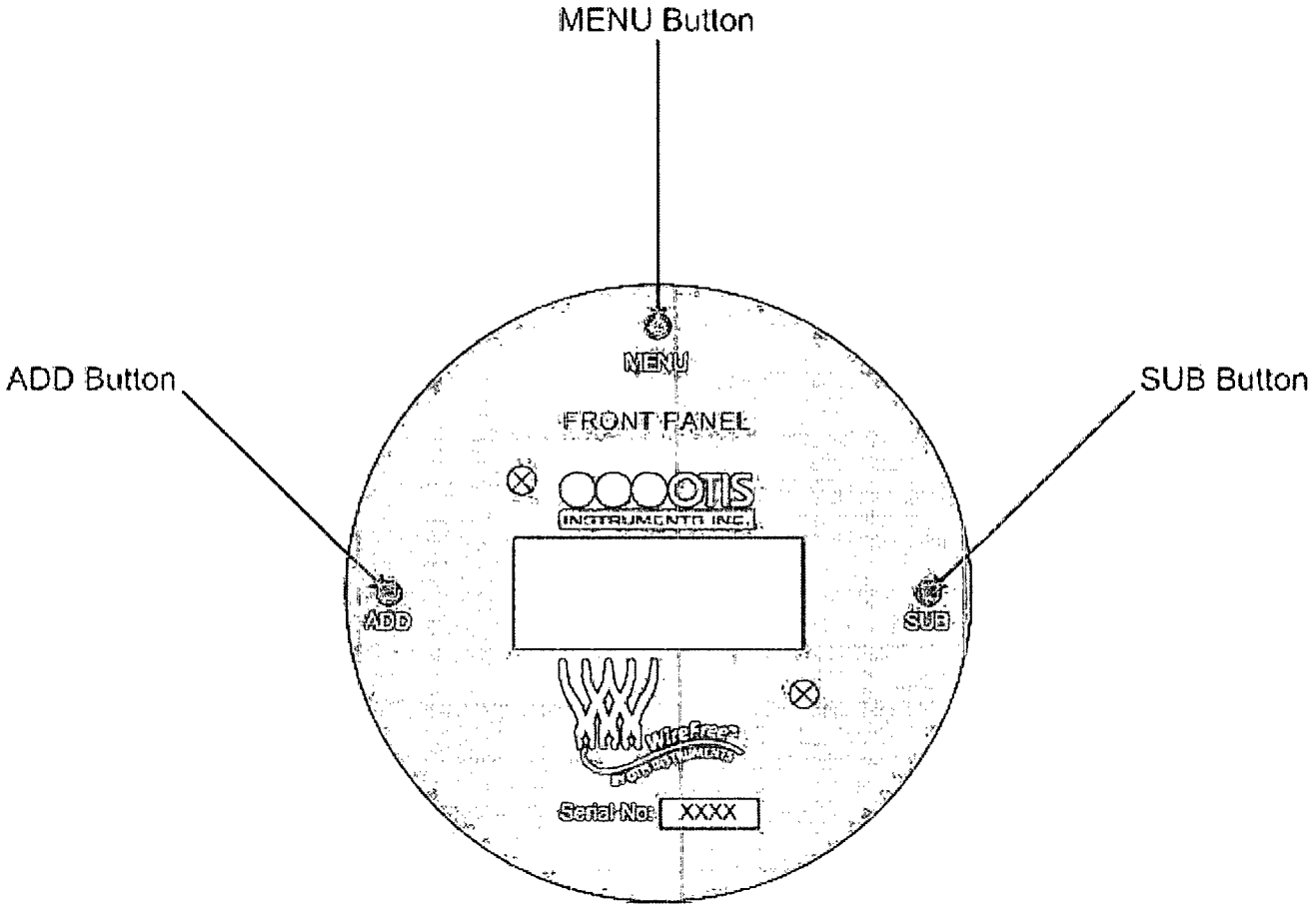


Power On

Powering on the device activates its functions. When powered on, the device is fully functional and access to system and settings menus is allowed.

> ***NOTE: Before powering on, make certain that the device is in clear air. To assure a clean air environment, either power-on the device from an off site location or use a calibration cup attached to a clean air supply bottle.***

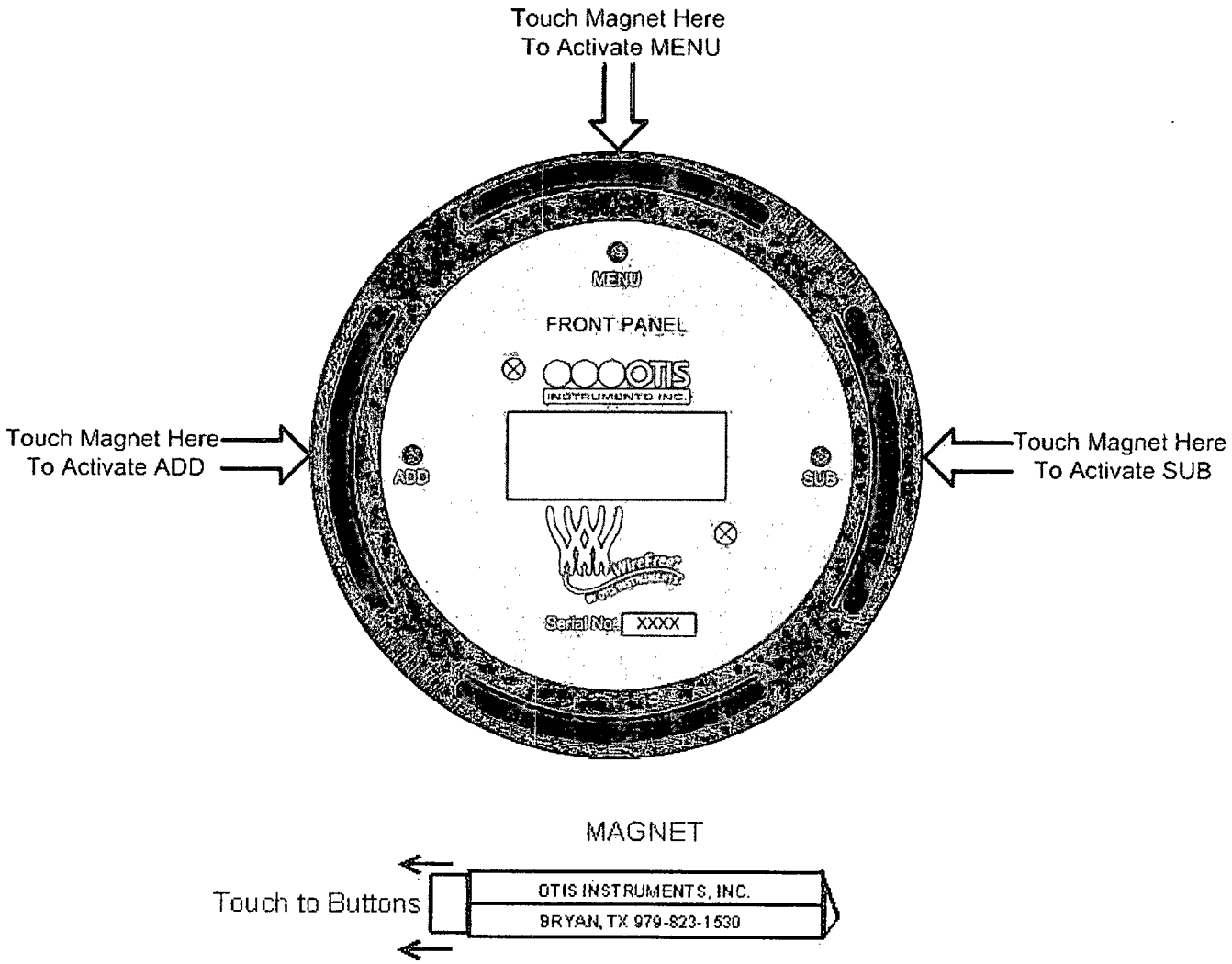
1. Locate *ADD* on the Front Panel.



Power On cont...

2. Touch an Otis Instruments, Inc. distributed magnet to the left side of the device to activate *ADD*.

NOTE: When the magnet touches the device and a connection has been made, two dots will appear.



Power On cont...

3. The device will display:

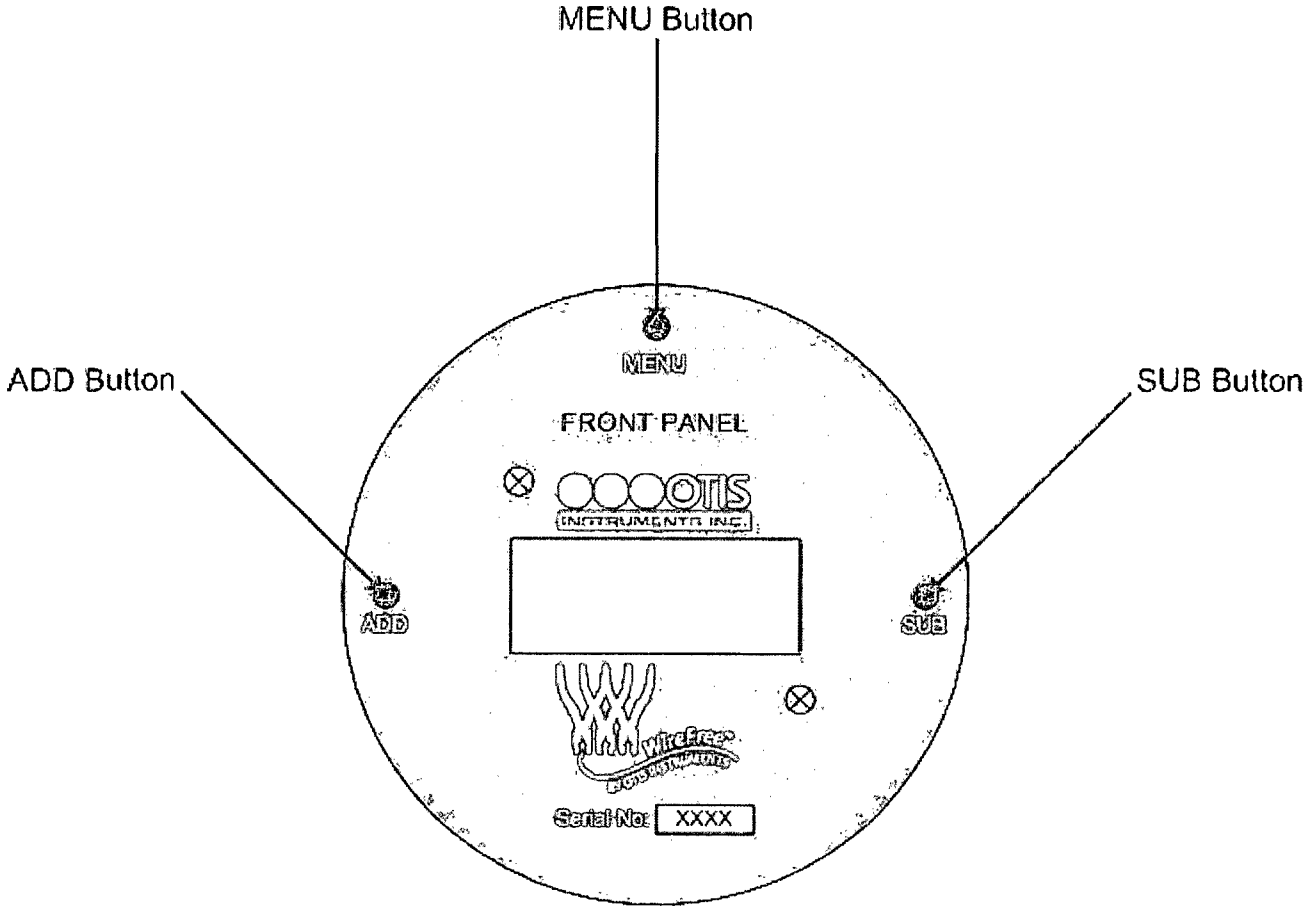
   - Revision number (r 1.81)
   - H_2S (H 25)
   - Battery voltage (b 3.6)
   - Address (Adr 8)

4. The device will count down from 35 to 0.
5. When "0" is displayed, the device is in Normal Operating Mode and ready to operate.

Power Off

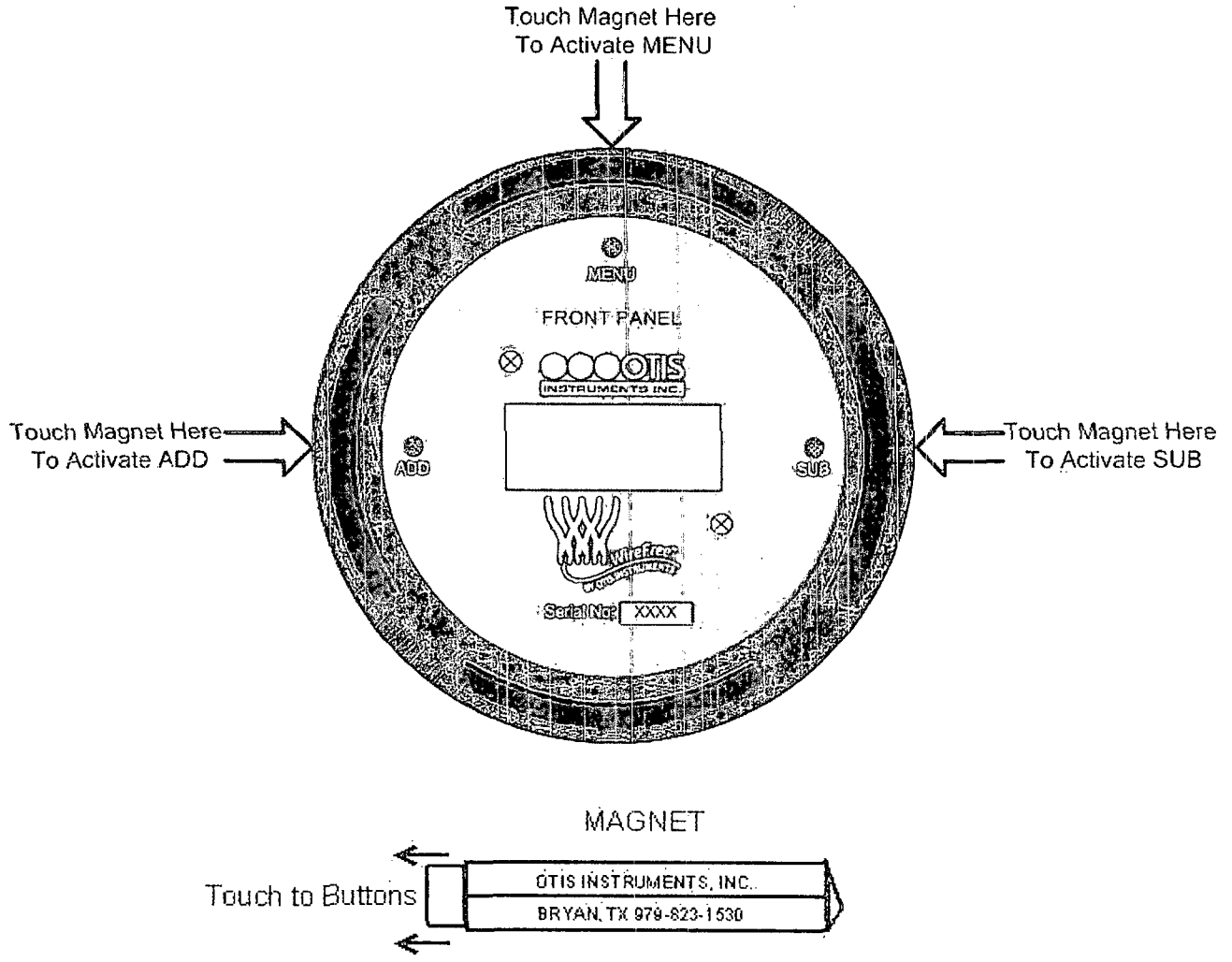
Powering off the device shuts down the system. When powered off, the device is no longer transmitting signals so the receiving controller will display "FAU" for that sensor channel.

1. Locate *SUB* on the Front Panel.



2. Touch and hold an Otis Instruments, Inc. distributed magnet against the right side of the device for four seconds to activate *SUB*.

   NOTE: When the magnet touches the device and a connection is made, two dots will appear on the display screen.



3. When powering off, the display screen will switch from showing ".0" to "OFF". The display will continue to show "OFF" until the device is powered on.

Normal Operating Mode

When powered on, the device will enter and remain in Normal Operating Mode until commanded otherwise. The presence of gas will affect the transmission of signals to the receiving controller in the following ways.

- When the device is in Normal Operating Mode, and there is no gas present, the sensor will send a message to the receiving controller every minute (approx.) to indicate that the system is in working order.

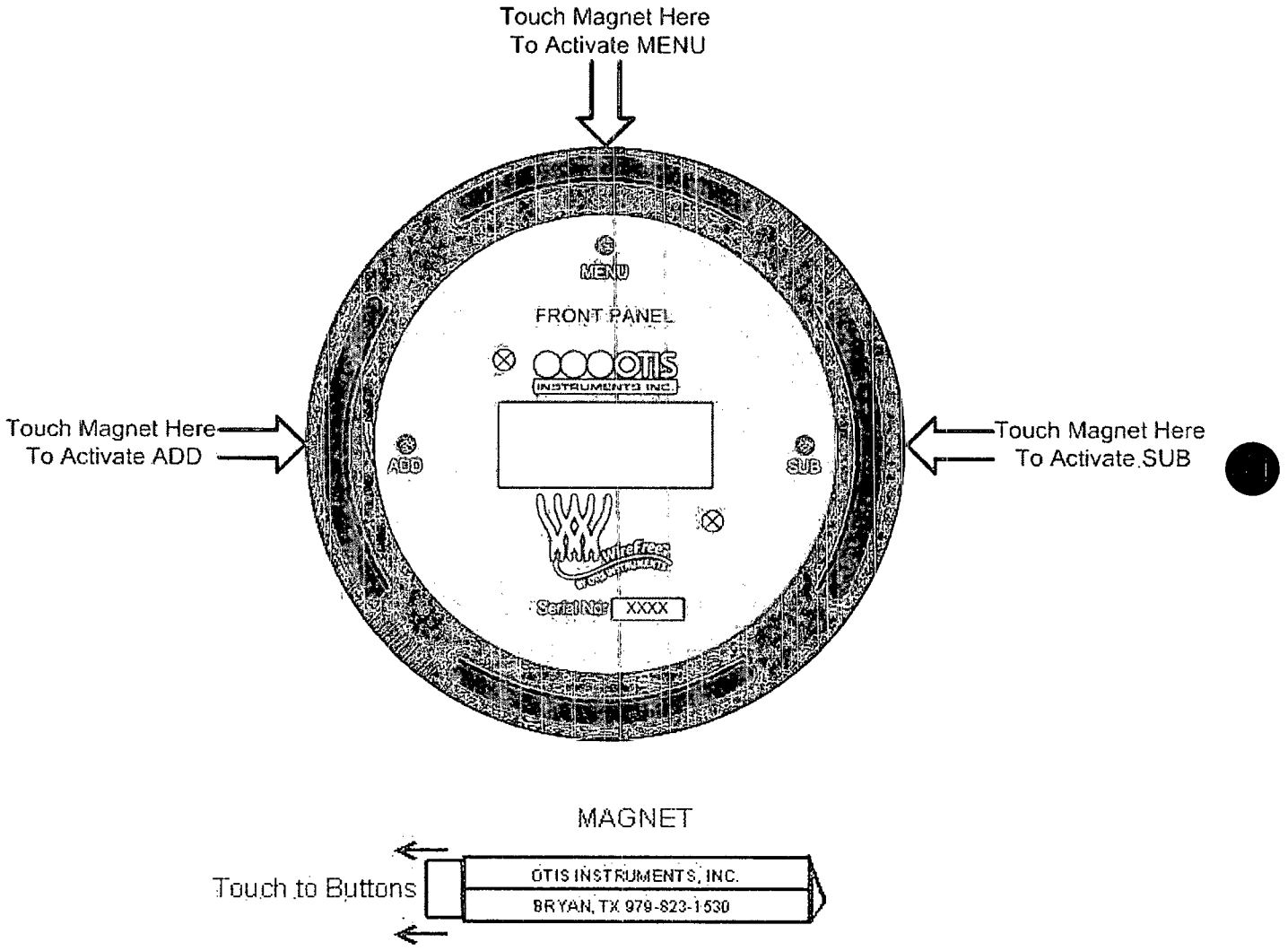
- When gas is present, and above the Background Gas Level, the device will report to the receiving controller every six seconds.

- When the gas level falls below the Background Gas Level the device will return to reporting every minute (approx.).

Setting Sensor Address

To ensure proper communication with the receiving monitor, set the Sensor Address to match the one assigned to this Sensor Assembly at the monitor.

1. Touch an Otis Instruments, Inc. distributed magnet against the top side of the device to active *MENU* and enter Setup Mode.

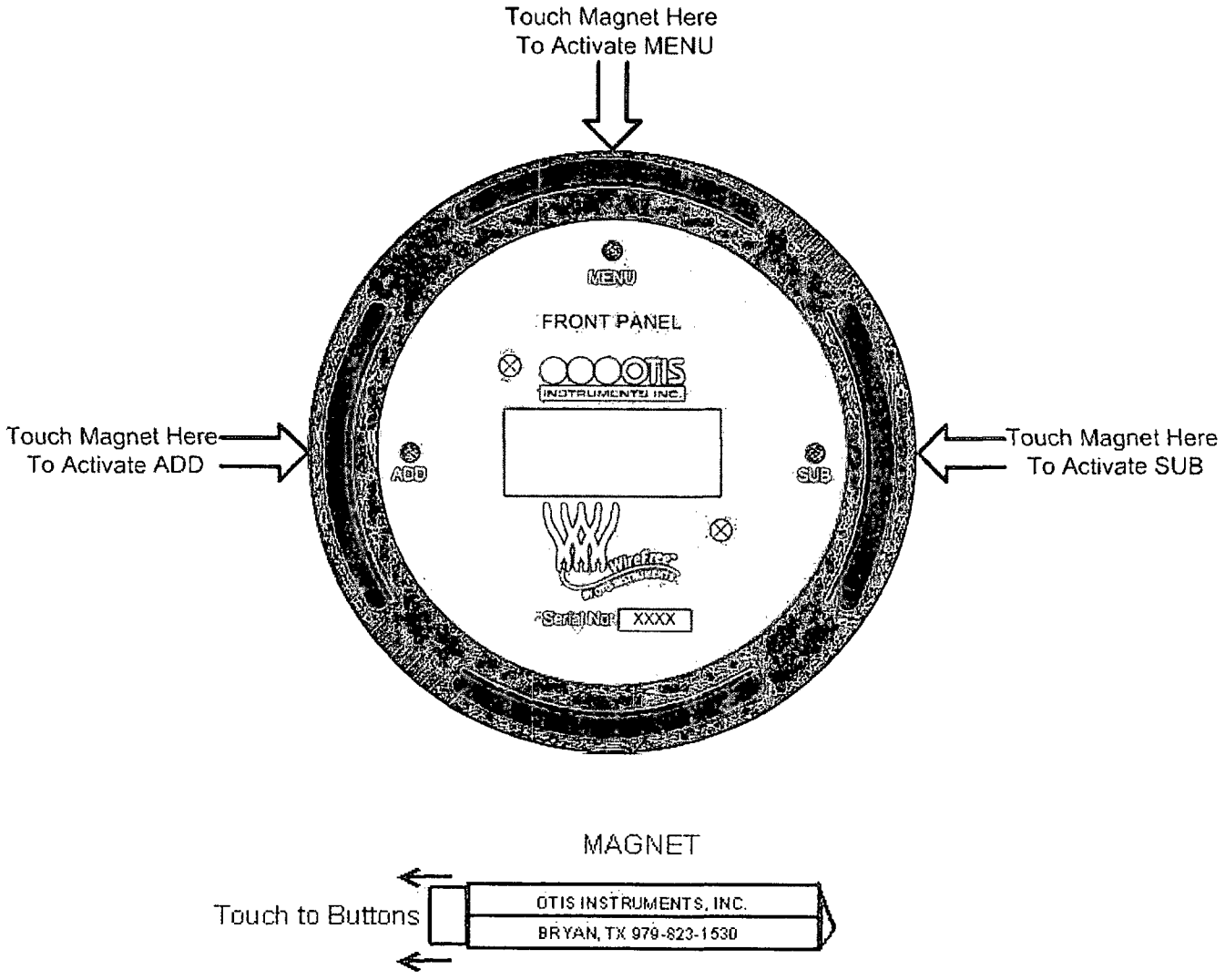


2. Touch the magnet to *MENU* once.
3. The display screen will show "Adr" and then a number.
4. Touch the magnet to *ADD* (increase) or *SUB* (decrease) until the desired Address Setting is displayed.
5. Once the sensor address is set, touch the magnet to *MENU* twice to exit Setup Mode.

Relay/Alarms Test Setting

The relay/alarms test should be completed periodically to ensure full functionality of the relay/alarms, and accurate transmission of radio waves from the device to the transmission controller.

1. Touch and hold an Otis Instruments, Inc. distributed magnet against the top side of the device for five seconds to active *MENU* and enter Menu Mode.

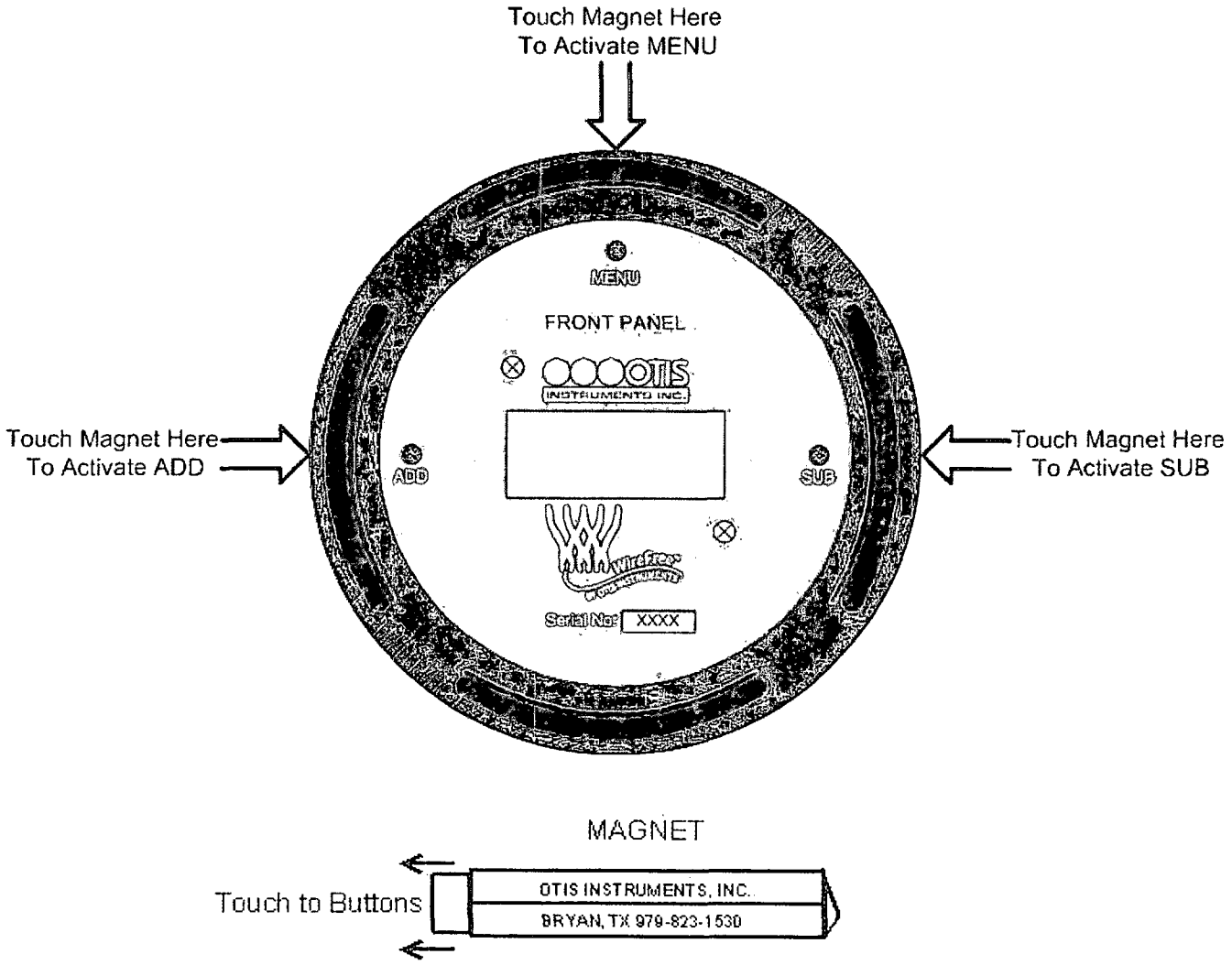


2. The display screen will show "r 0".
3. Touch the magnet to *ADD* to increase the reading by 5 PPM. Continue touching the magnet to *ADD* until the increasing number reaches the pre-set level to trigger the relay/alarms.
4. Once the test is complete, touch the magnet to *MENU* two times to exit Menu Mode.

Setting Background Gas Level

The Background Gas Level should be used to avoid unwanted sensing of normal gas levels in the field. Once set, the device will transmit a message to the receiving controller every minute until gas is present at the Background Gas Level or above. When at this heightened level, the device will transmit a message to the receiving controller every five seconds until the gas level falls back below the Background Gas Level setting.

1. Touch and hold an Otis Instruments, Inc. distributed magnet against the top side of the device for five seconds to active *MENU* and enter Menu Mode.



2. The display screen will show "r 0".

Setting Background Gas Level cont...

3. Touch the magnet to *MENU.*
4. The display screen will show "bgr" and then a number.
5. Touch the magnet to *ADD* (increase) and *SUB* (decrease) to manipulate the Background Gas Level setting.

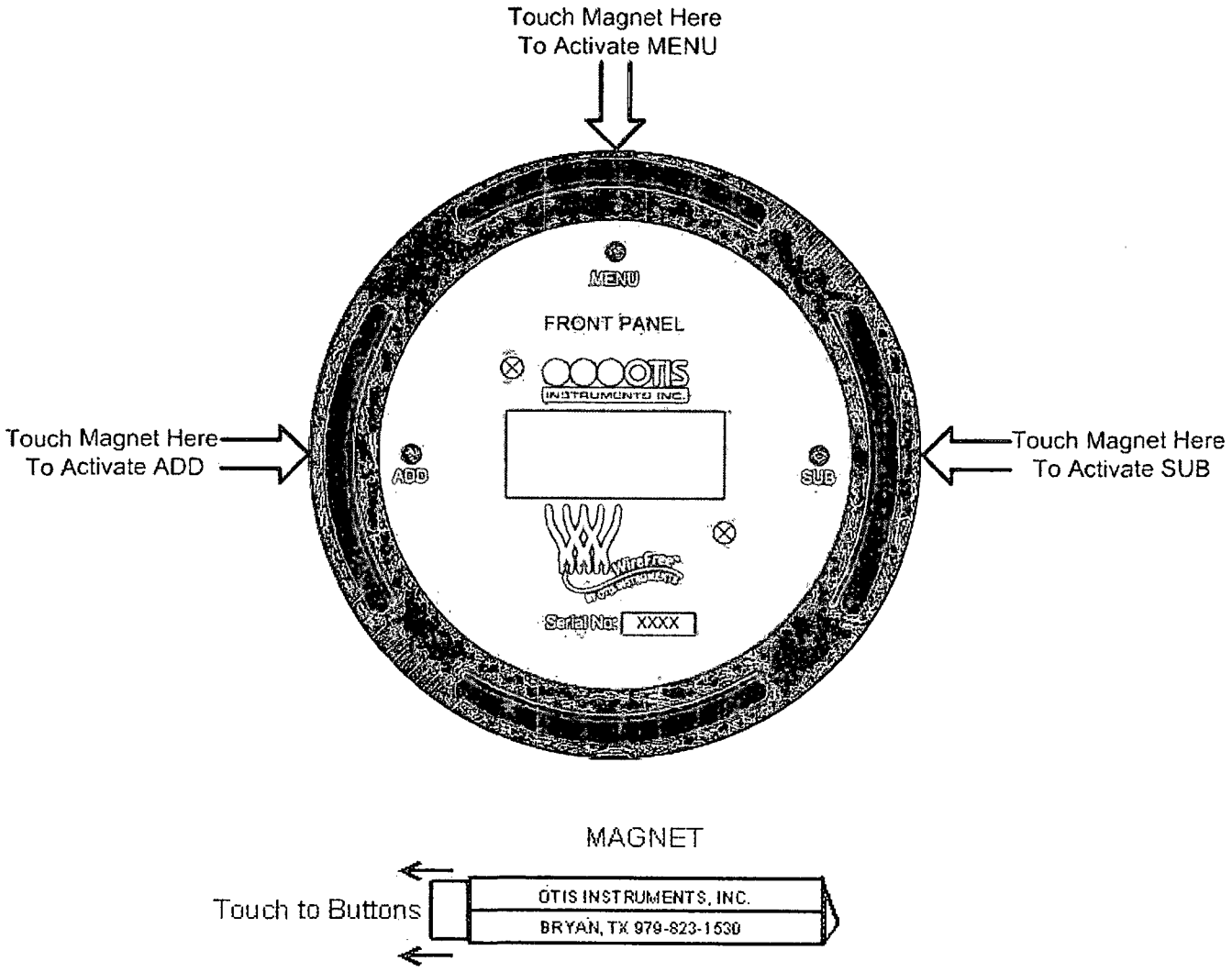
> *NOTE: The device will transmit a message to the controller every minute until gas is present at (or above) the Background Gas Level. If the Background Gas Level is reached, the device will transmit a message every five seconds until the gas level falls below the Background Gas Level Setting.*

6. Once the desired setting is reached, touch the m gnet to *MENU* to exit Menu Mode.

Checking Battery Voltage

The battery voltage should be checked periodically to ensure that the voltage being supplied to the Sensor Assembly is adequate for proper functionality (more than 3.0).

1. Touch an Otis Instruments, Inc. distributed magnet against the top side of the device to active *MENU* and enter Setup Mode.



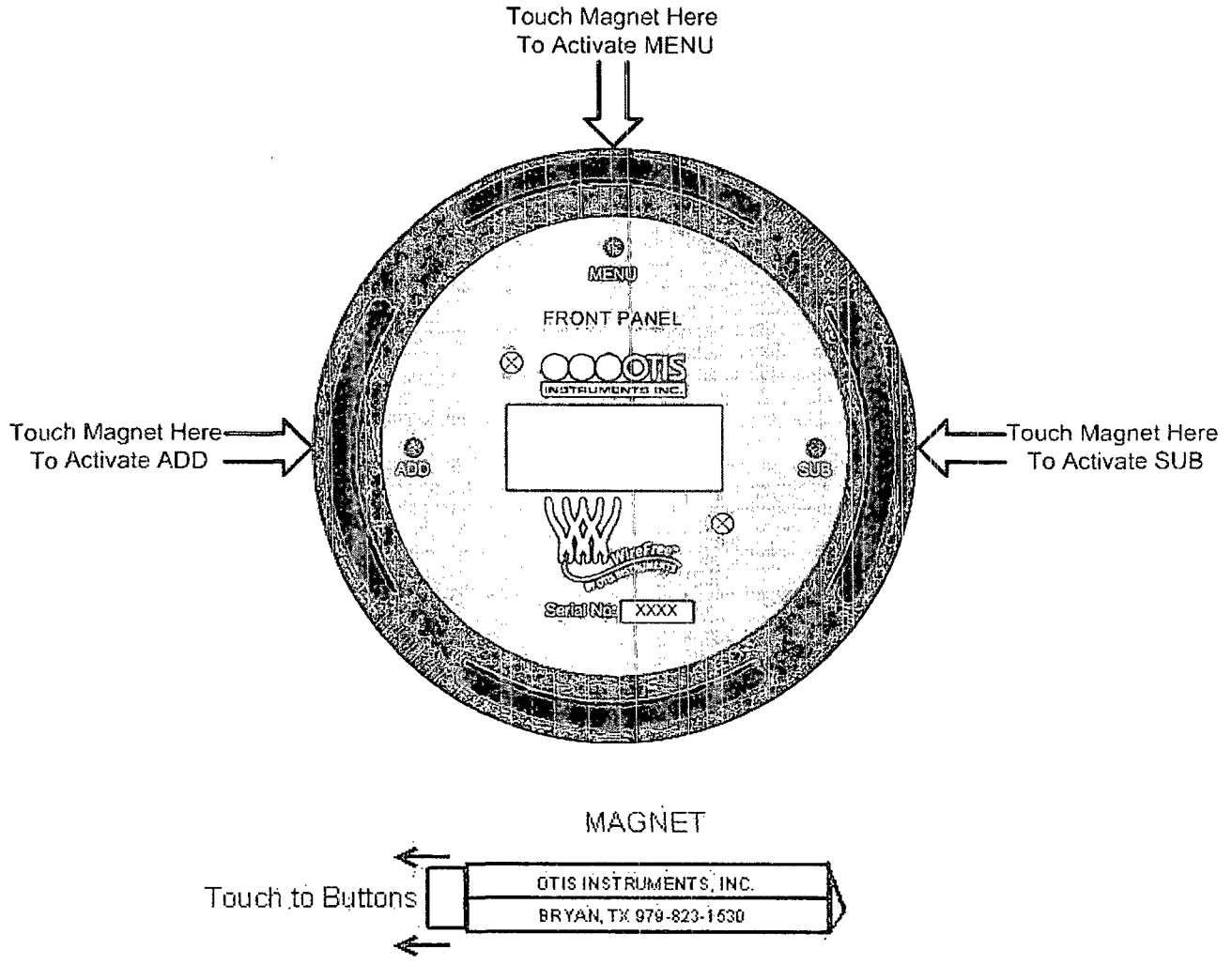
2. Touch the magnet to *MENU* twice.
3. The display screen will show the battery voltage as "b x.x". If this battery voltage is less than 3.0 the battery should be replaced (see Battery Replacement).
4. Once the battery voltage has been checked, touch the magnet to *MENU* to exit Setup Mode.

Battery Replacement

To ensure full-functionality, the battery should be replaced if the voltage is less than 3.0. To check the battery voltage, refer to the Checking Battery Voltage section in this Operation Manual.

The device uses an Otis size "D" Lithium 18AH battery with connector. New batteries should only be obtained from Otis Instruments, Inc. or an affiliated distributer.

1. Power off the device by touching and holding an Otis Instruments, Inc. distributed magnet against the right side of the device for five seconds to activate *SUB*.



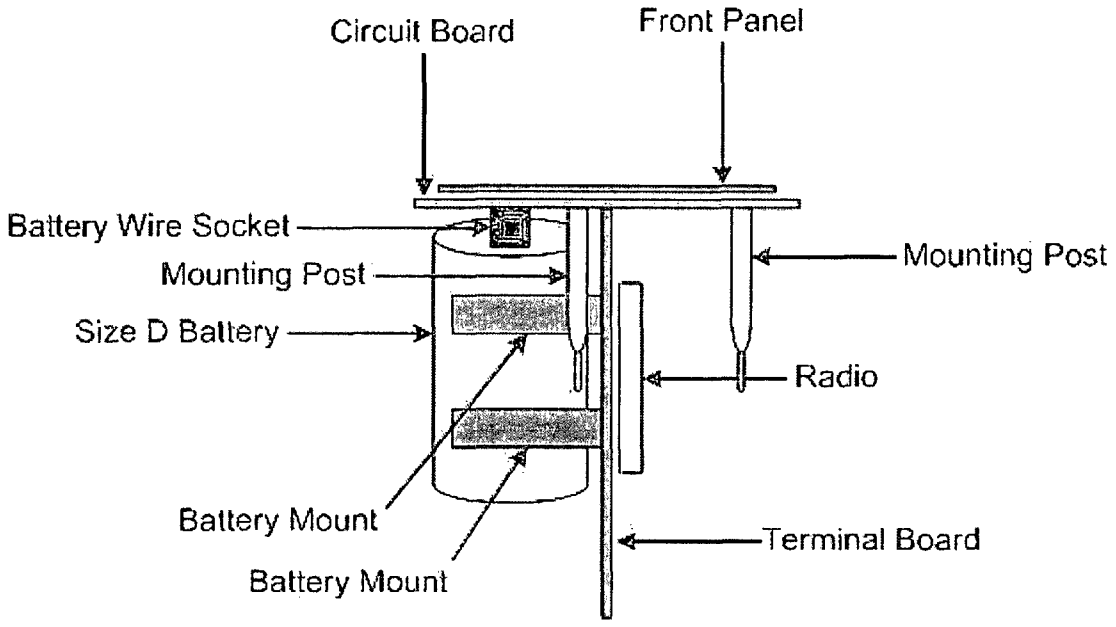
Battery Replacement cont...

2. Unscrew, remove, and set aside the explosion proof Moore lid.
3. Using only your fingers, pull straight up on the Front Panel until it is removed from both standing eyelets.

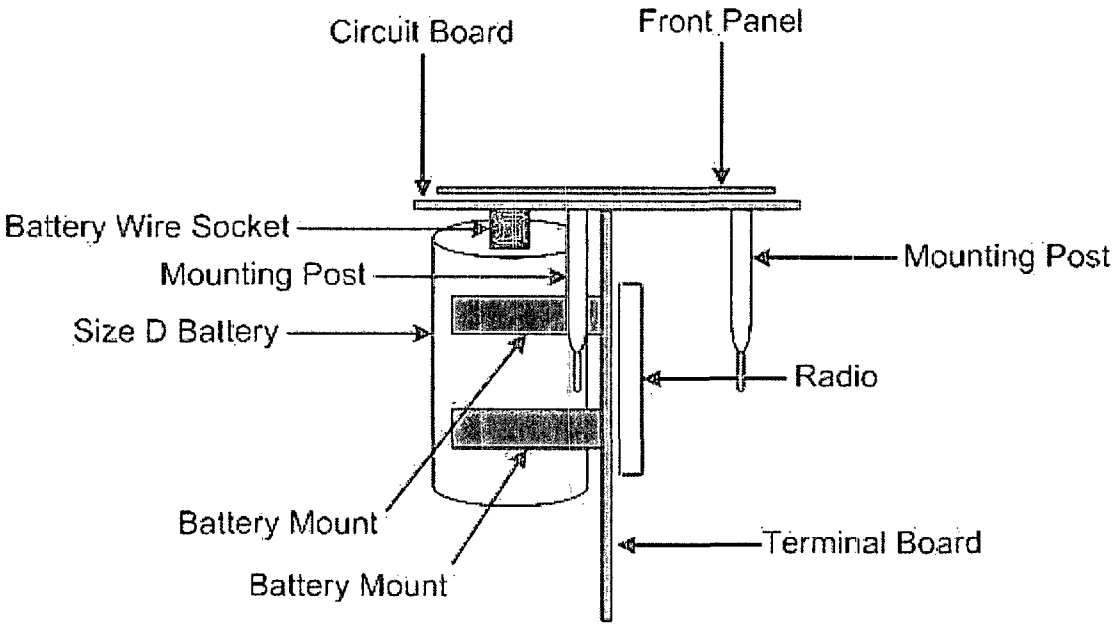
NOTE: Do not use any metal object to help remove the Front Panel.

NOTE: Do not remove any connecting wires.

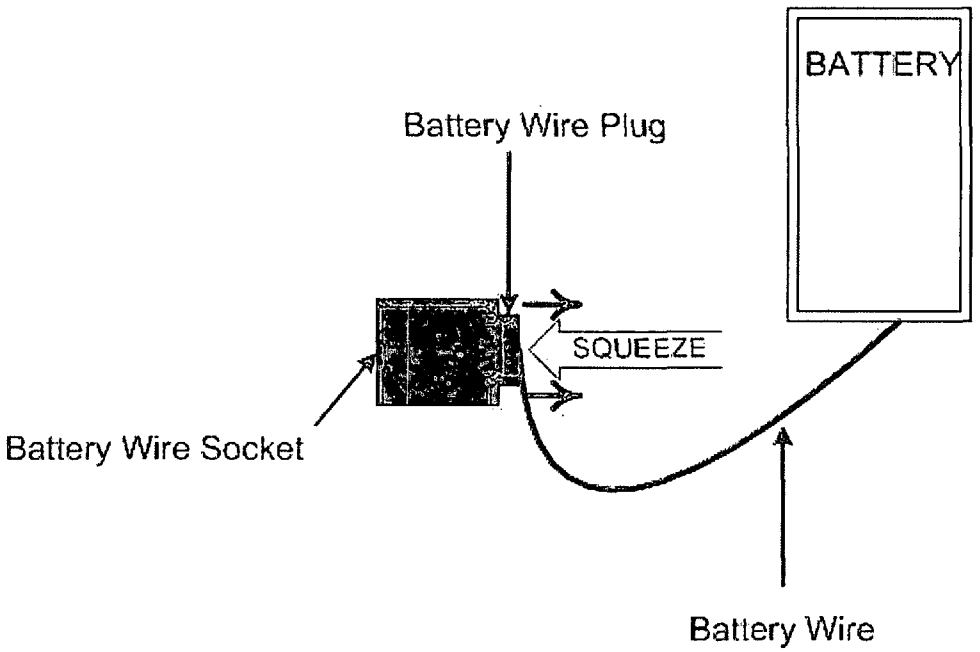
4. Gently lay the Front Panel to the side of the device so that inside of the Moore enclosure is visible.



5. Remove the battery from the two battery mounts.
6. Squeeze the top and bottom of the battery wire's plug, located in the battery wire socket on the circuit board.

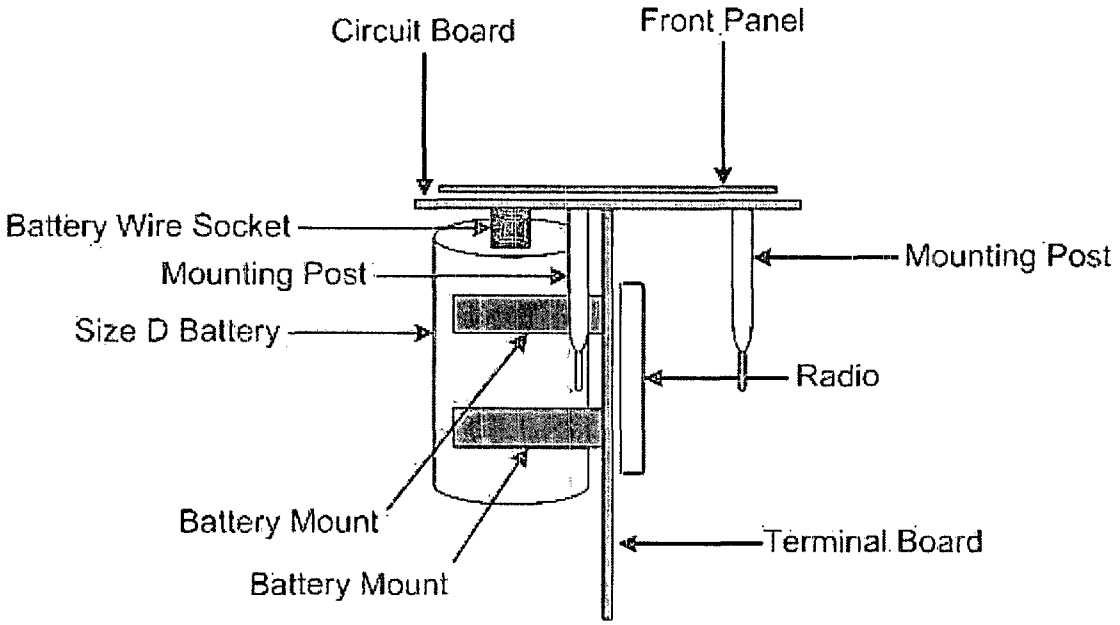


7. Pull the battery wire's plug straight out of the socket.

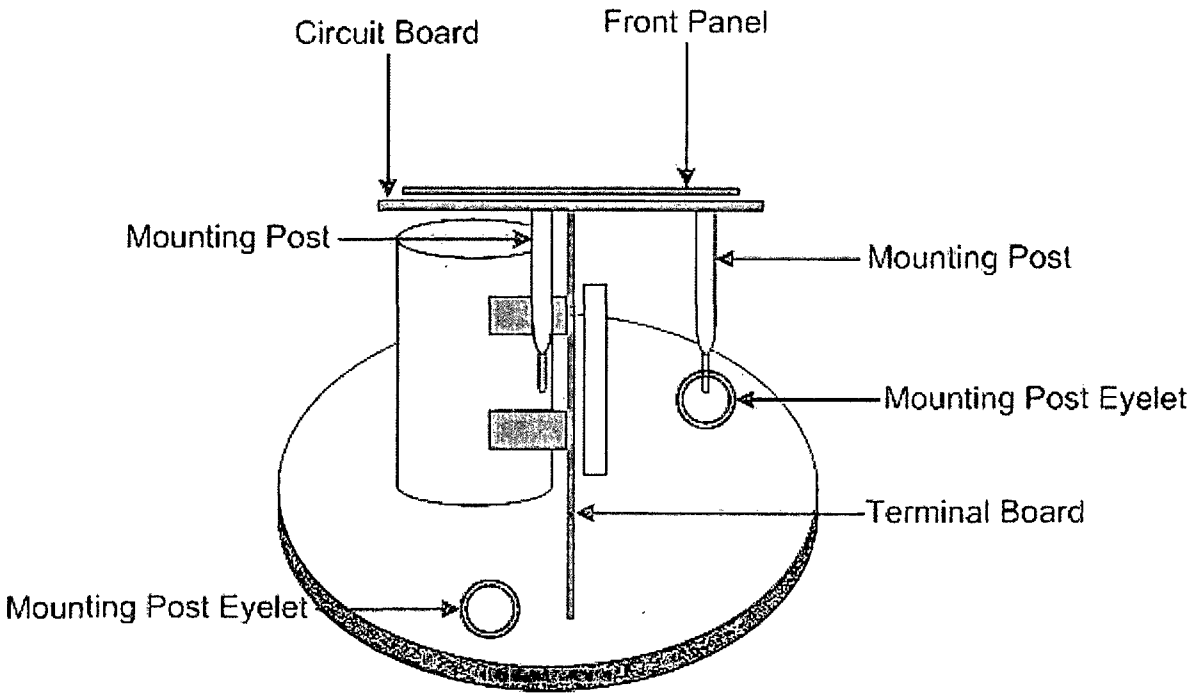


8. Place the new battery's plug in the socket.
9. Slide the new battery into the battery mounts.

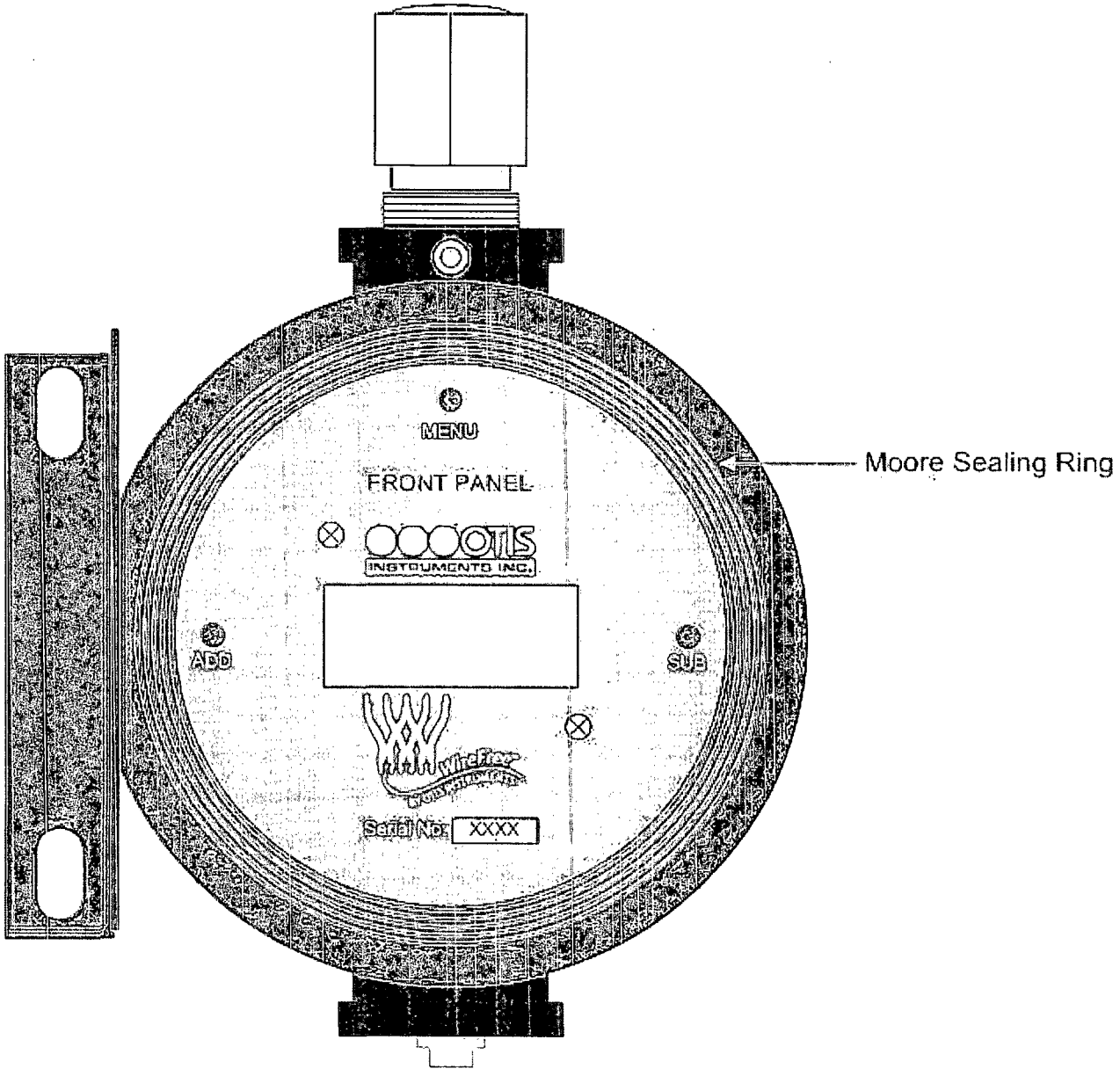
10. Replace the circuit board back in the Moore enclosure by matching each sensor mounting post to its corresponding eyelet inside the enclosure.



11. Verify that each mounting post is properly fitted in its corresponding eyelet inside the Moore enclosure.



12. Verify that the sealing ring on the Moore base is still in place.

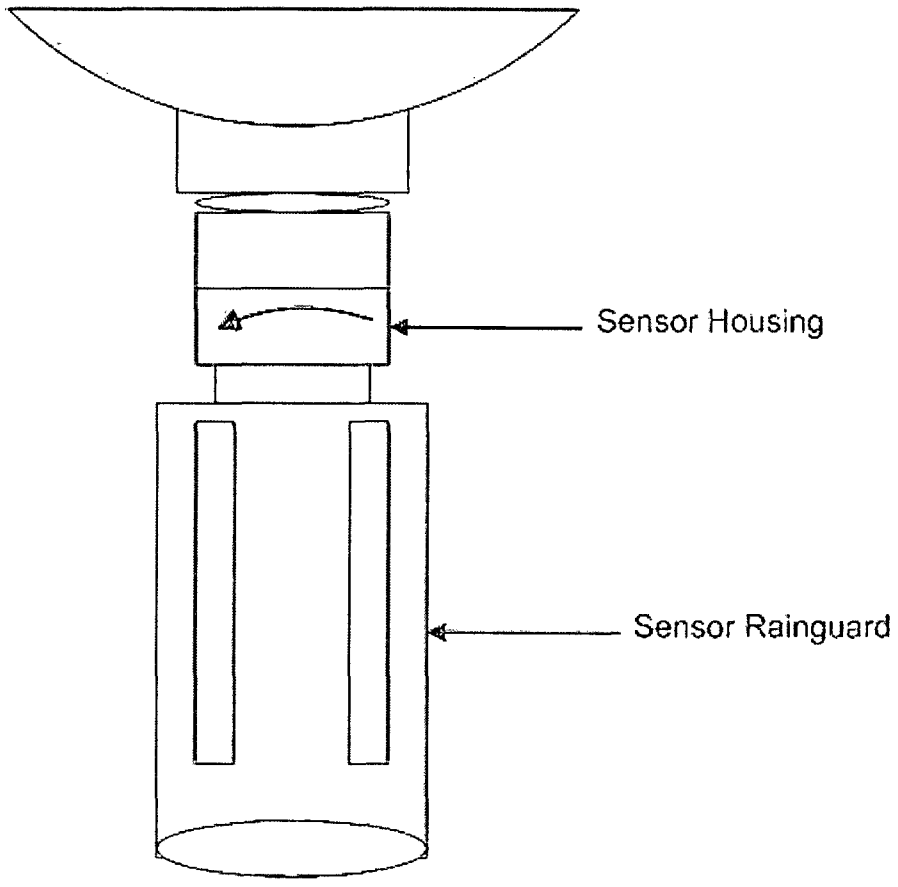


13. Place the Moore enclosure lid on top of the Moore enclosure base.
14. Rotate the lid until it is tightly screwed in place (approximately 20 rotations).
15. Power on the device and check the battery voltage (the third reading shown) to ensure that the new battery is fully functional and at 3.6 volts (b 3.6).

Sensor Replacement

The device's sensor detects gas in parts per million. The sensor must to be fully functional in order to alert the user of the presence of toxic gas at a dangerous level. Failed alarm tests could be an indicator of the device needing sensor replacement.

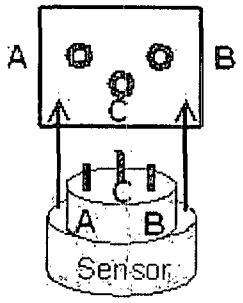
1. Power off the device by touching and holding an Otis Instruments, Inc. distributed magnet against the right side of the device for five seconds to activate *SUB*.
2. Unscrew and remove the sensor housing.



3. Using the thumb and forefinger, slide the sensor out of the device.

NOTE: Do not use any metal object to remove the sensor.

4. Slide the new sensor into device, matching the sensor prongs to the corresponding eyelets inside.



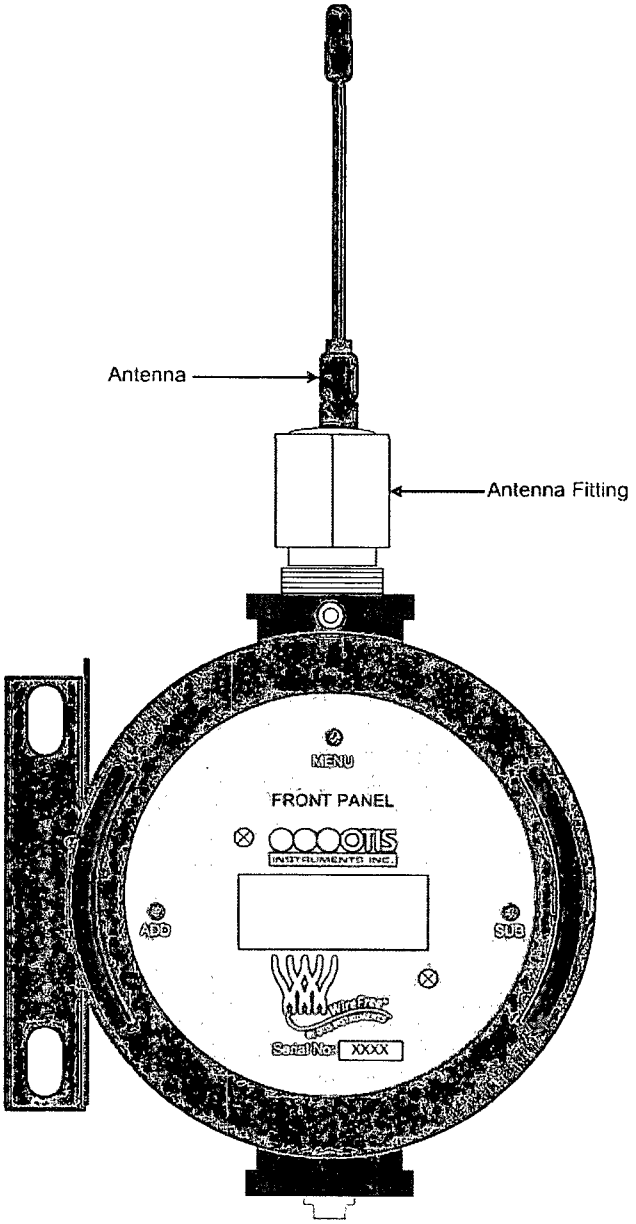
5. Screw the sensor housing back in place.

NOTE: Once the sensor has been changed the device must be re-calibrated (see page 20).

Antenna Replacement

The antenna is used to aid in sending clear and reliable radio signals to the transmission controller. The current antenna can be replaced by any antenna that is compatible with the fitting on the right side of the device.

1. Power off the device by touching and holding an Otis Instruments, Inc. distributed magnet against the right side of the device for five seconds to activate *SUB*.
2. Unscrew the current antenna located on the top of the device.



3. Screw new antenna into the antenna fitting.

APPENDIX A: OI-WF690 Sensor Calibration

Calibration

System calibration is necessary for the device to accurately sense gas and to send messages to the transmission controller in relation to gas presence in parts per million. Each time a sensor is replaced the device must be re-calibrated.

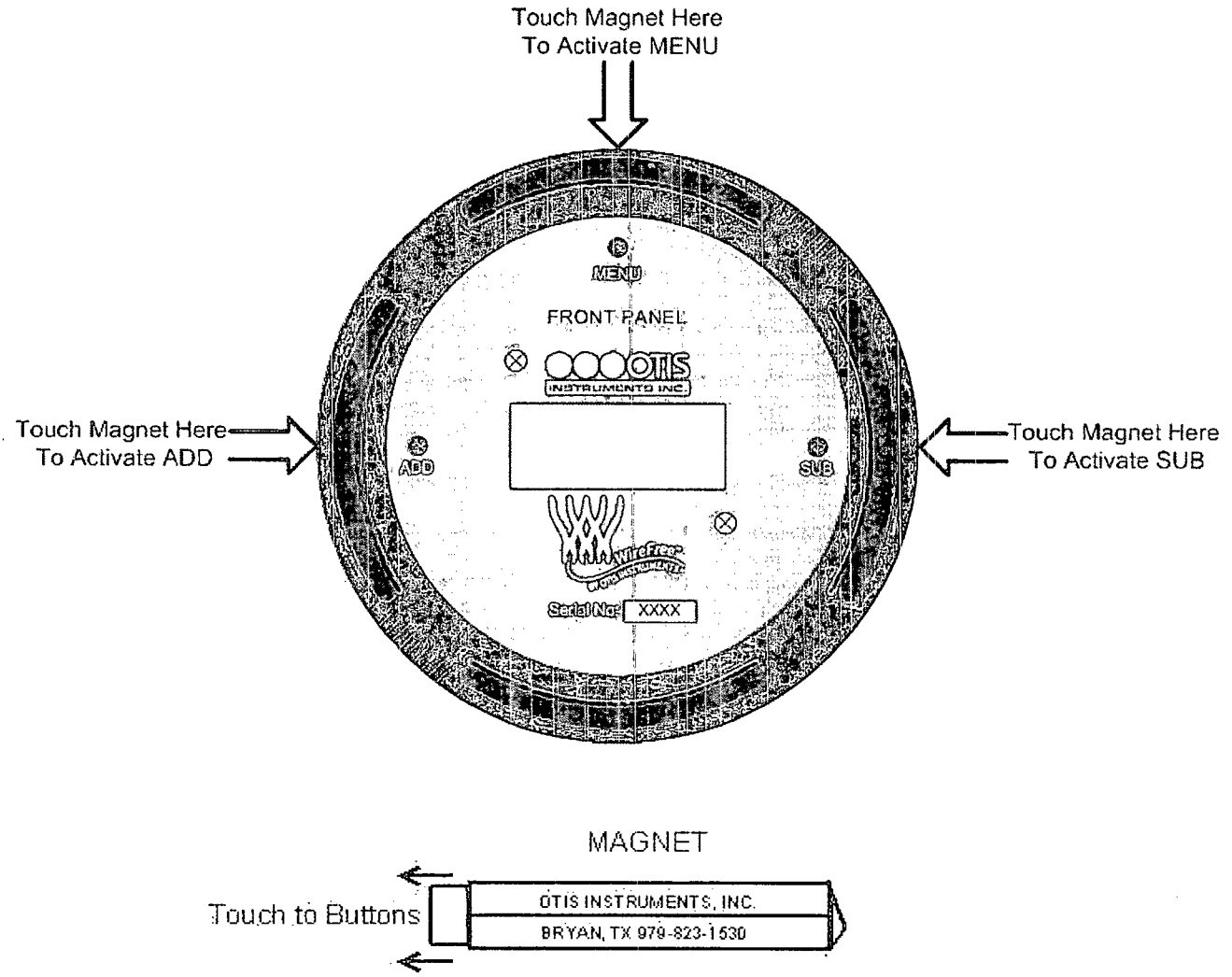
The Model OI-WF690 is equipped with a dual set of switches for *MENU*, *ADD* and *SUB*. The manual and magnet switches are located on the Front Panel. Manual switching may be used in calibration when the Moore explosion proof enclosure lid is removed. The magnet switches, for non-intrusive calibration, are activated by an Otis Instruments, Inc. distributed magnet.

Change/Check Null

The Model OI-WF690 features auto-setting Null. The Null is automatically set when the device is powered-on—eliminating the need for a Null user interface.

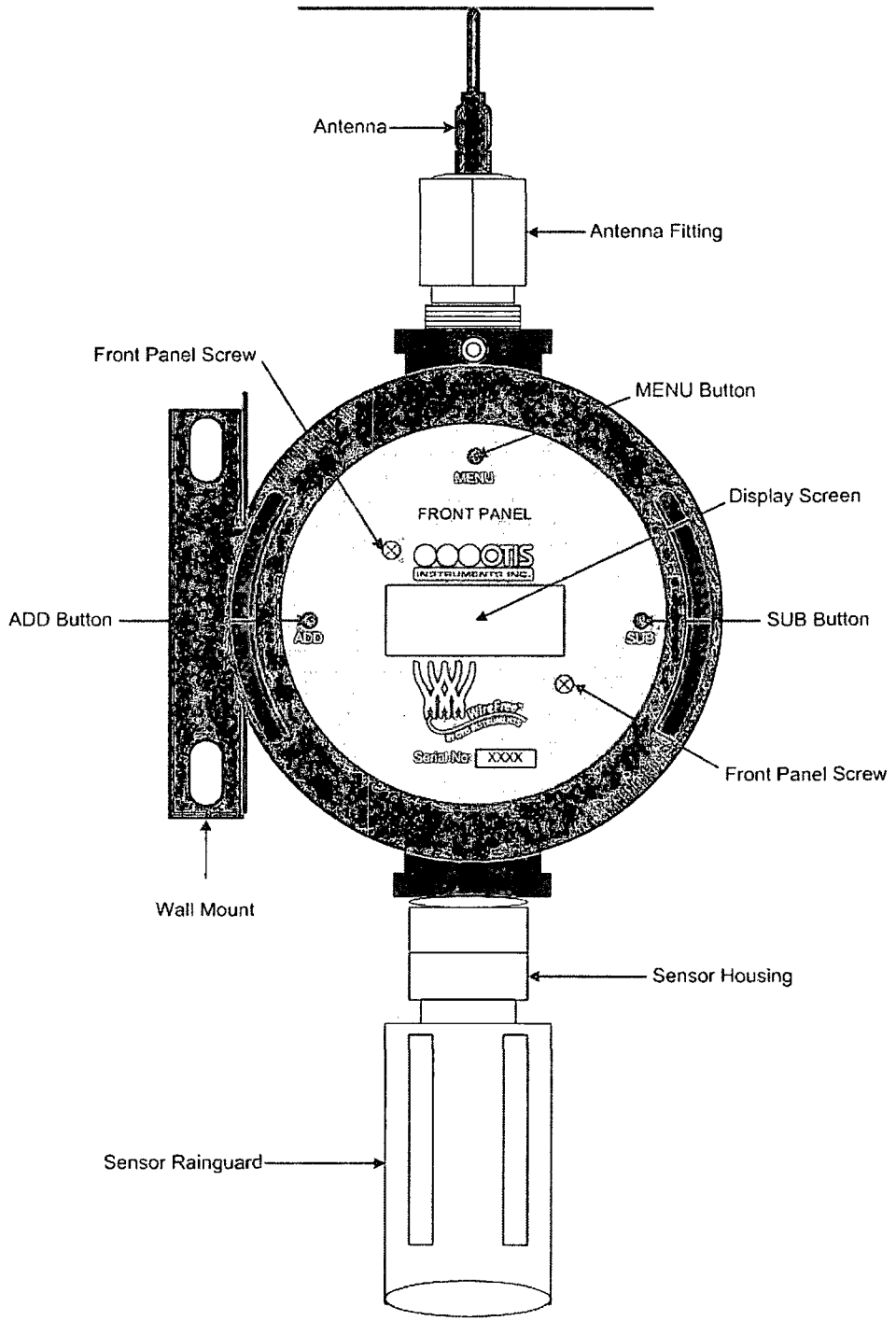
Setting Calibration

1. Touch an Otis Instruments, Inc. distributed magnet to the top side of the device to activate *MENU*.



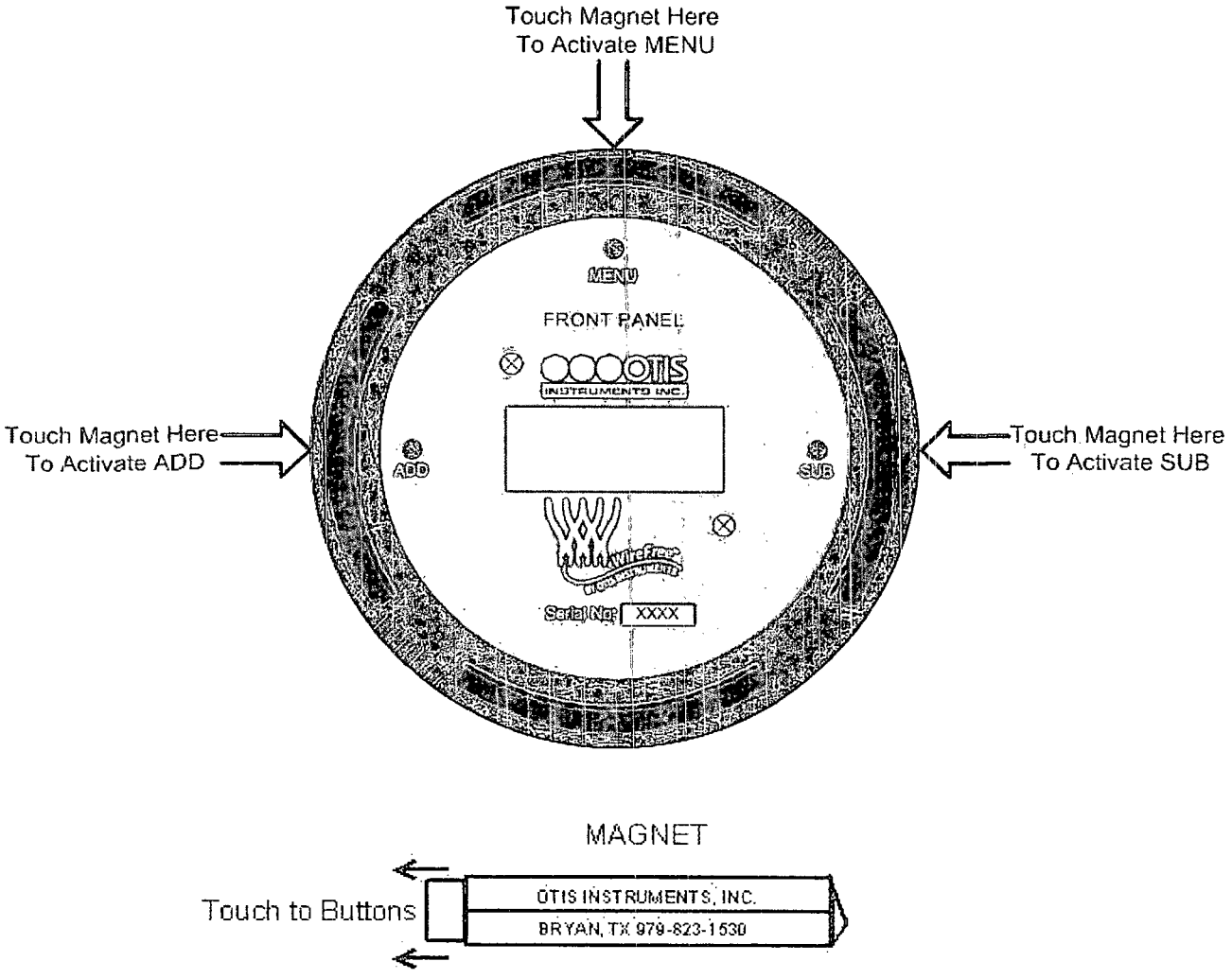
2. The display screen will flash "CAL".

3. Unscrew and remove the sensor rainguard from the sensor housing.



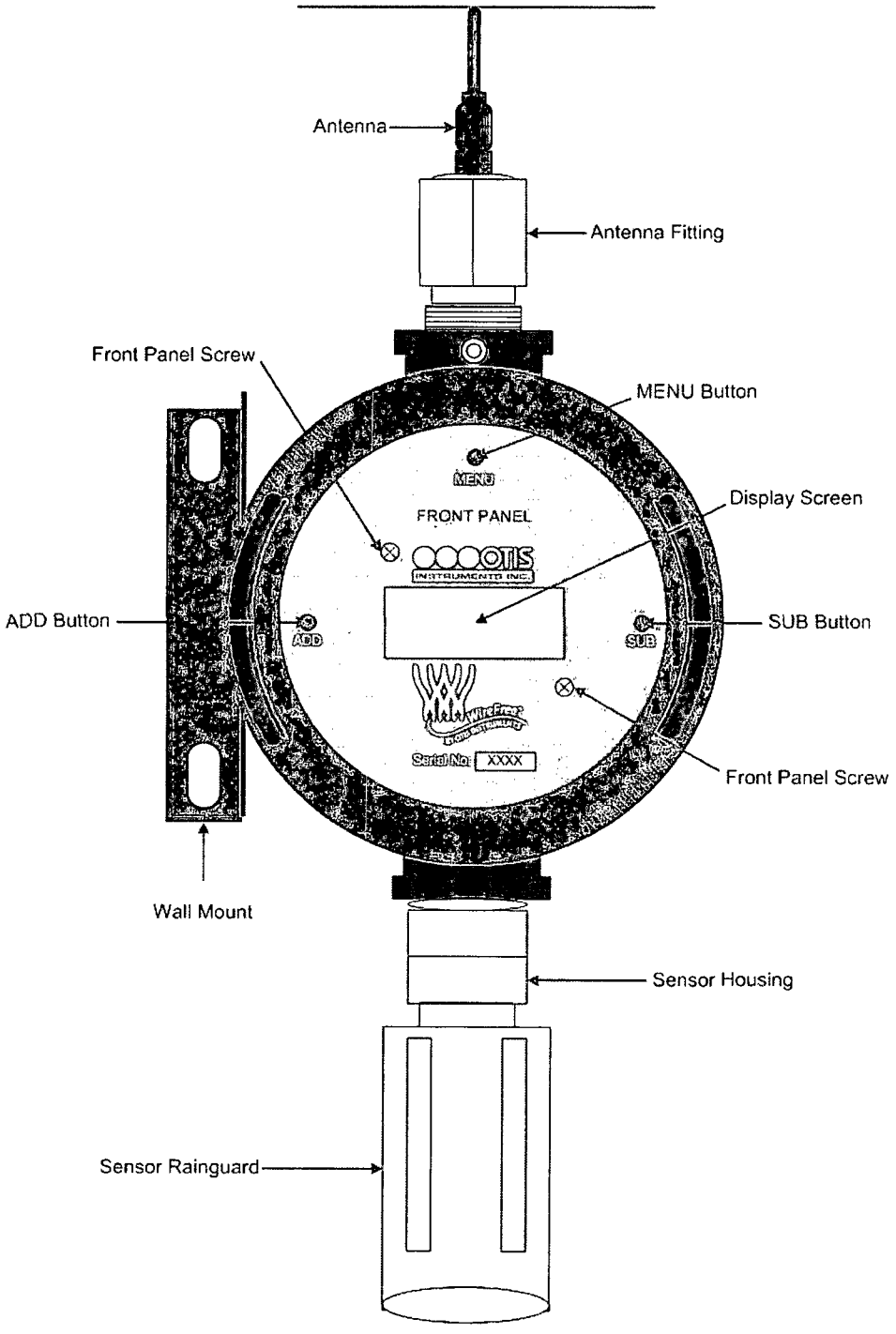
4. Replace the sensor rainguard with an Otis OI-410 Calibration Cup.
5. Apply a known calibration gas to the OI-410 Calibration Cup that is attached to the sensor housing.
6. The sensor's detection of gas will begin to climb in value as shown on the display screen.
7. Watch the display screen until the number displayed stops increasing.
8. Touch the magnet to the device, *ADD* (increase) or *SUB* (decrease), to manipulate the reading on the display screen to match that of the calibration gas.

EXAMPLE: If the calibration gas is 25 PPM and the number on the display screen is 22 PPM, touch the magnet to *ADD* three times.

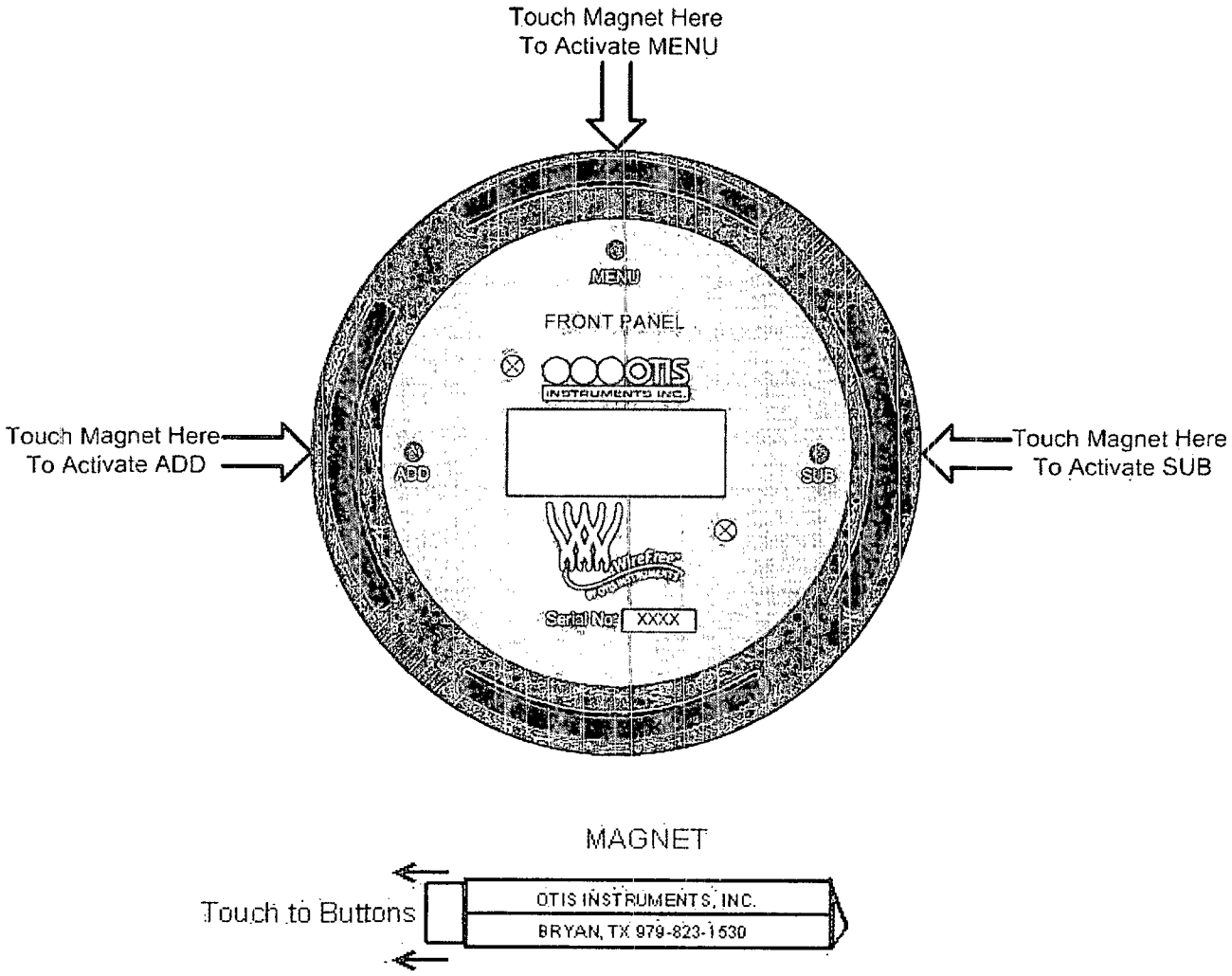


Setting Calibration cont...

9. The device is now calibrated.
10. Unscrew the OI-410 Calibration Cup.
11. Reattach (screw on) the sensor rainguard.



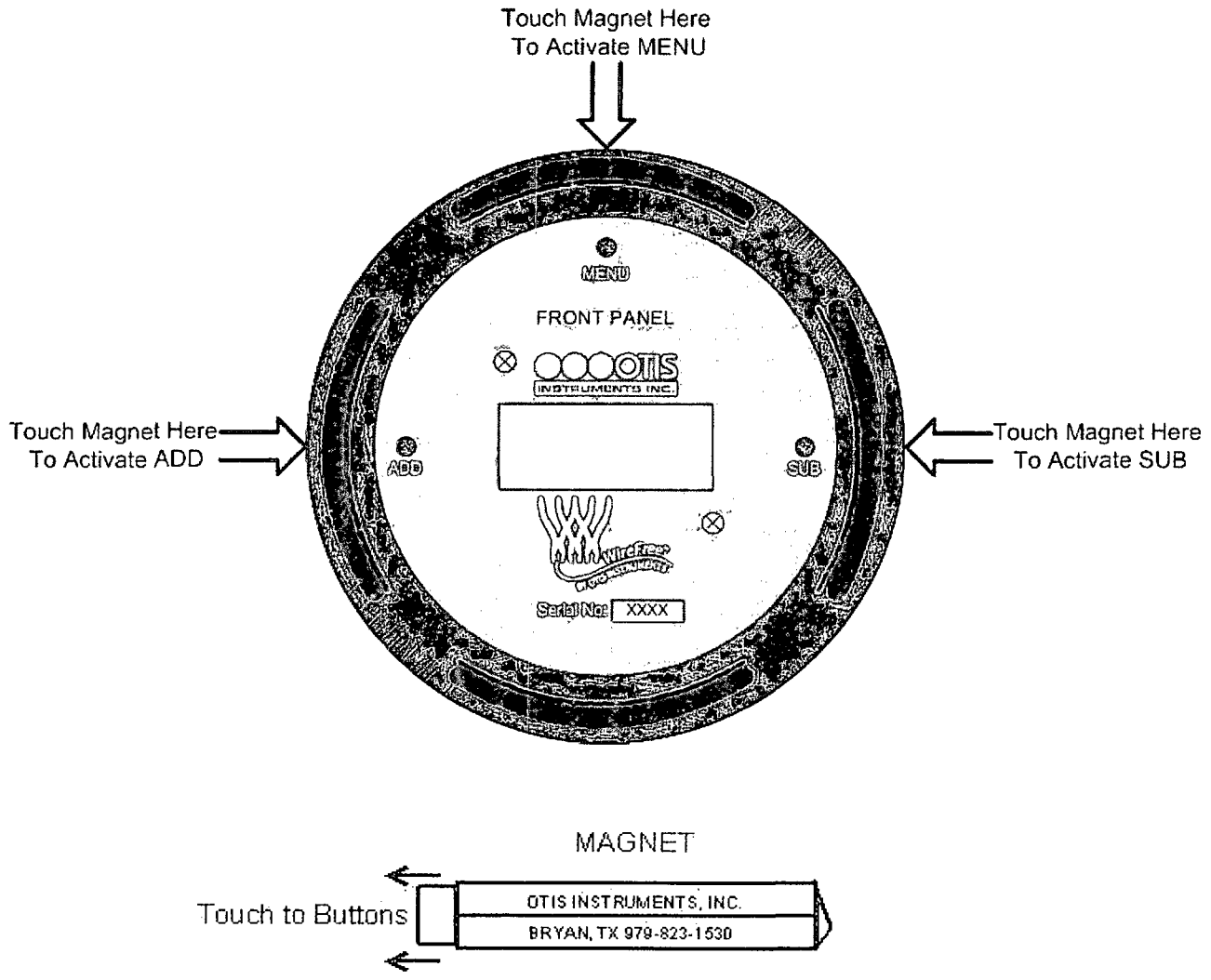
12. Touch the magnet to *MENU* three times to exit Calibration Mode.



NOTE: Calibration is now complete and the Relay/Alarms are active.

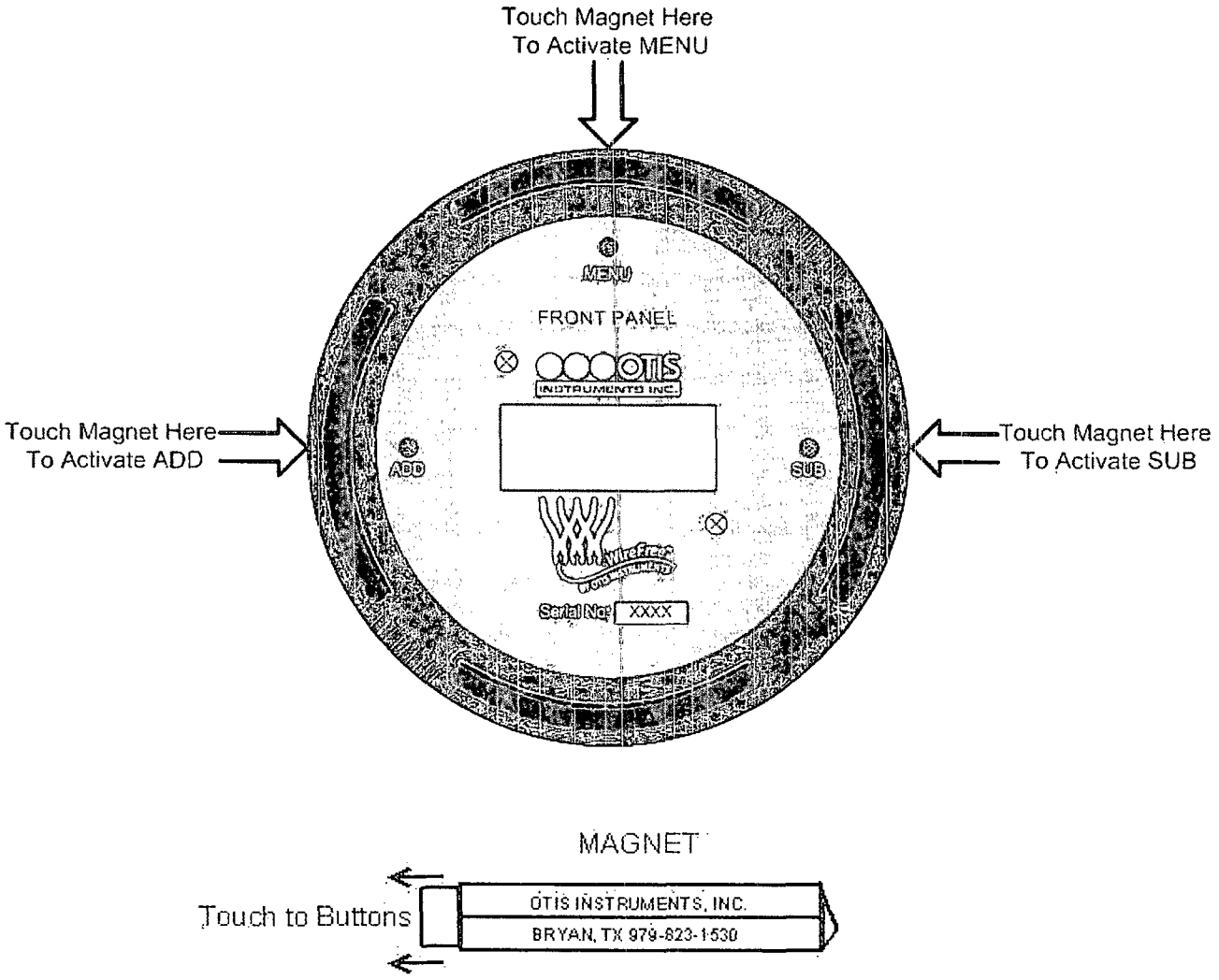
Checking Calibration

1. Touch and hold an Otis Instruments, Inc. distributed magnet against the top side of the device for five seconds to active *MENU* and enter Menu Mode.



2. The display screen will show "r 0".

3. Touch the magnet to *MENU* twice.



4. The display screen will show "c" and then a number.

EXAMPLE: c 81

5. This number is the sensor calibration number.
6. Touch the magnet to *MENU* to exit Menu Mode.

Specifications

Sensor Type:	Electro-Chemical '4' Series
Battery Type:	Lithium 18Ah with connector Model OI-WF690B
Battery Voltage:	3.6 Volts DC
Radio Wave:	900MHz Spread Spectrum
Unit Address:	1 to 255
Background Gas Level Adjustment:	1 to 20 ppm
Warranty:	Hardware: One year (limited) Sensor: Two years (varies with sensor type) Battery: 90 days from ship date

Warranty Statement for **WireFree Model OI-WF690**

Hardware

Otis Instruments, Inc. (Manufacturer) warrants its products to be free of defects in workmanship and materials—under normal use and service—from the date of purchase from the manufacturer or from the product's authorized reseller. The hardware for this device is under a one-year limited warranty.

The manufacturer is not liable (under this warranty) if its testing and examination disclose that the alleged defect in the product does not exist or was caused by the purchaser's (or any third party's) misuse, neglect, or improper installation, testing or calibrations. Any unauthorized attempt to repair or modify the product, or any other cause of damage beyond the range of the intended use, including damage by fire, lightening, water damage or other hazard, voids liability of the manufacturer.

In the event that a product should fail to perform up manufacturer specifications during the applicable warranty period, contact the product's authorized reseller or return the product directly to the manufacturer with a Return Material Authorization (RMA). This number will be assigned upon contacting customer service at 979.776.7700 or Otis@otisinstruments.com. The manufacturer will--at its option and expense--repair or replace the product, or deliver an equivalent product or part to the purchaser at no additional charge.

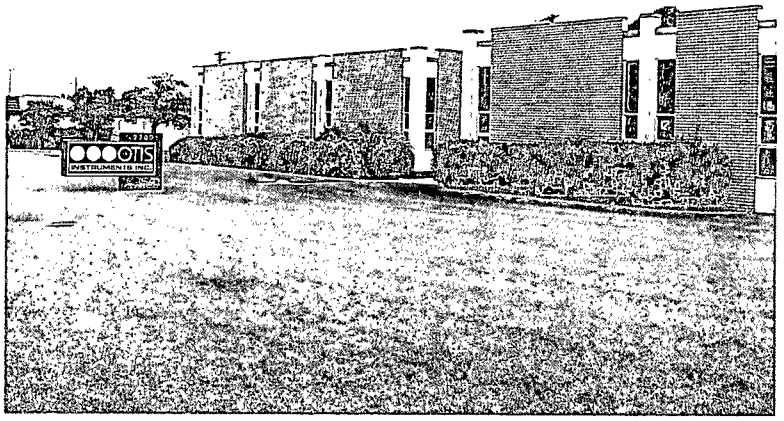
Any replaced or repaired product or part has either a 90-day warranty or the remainder of the initial warranty period (whichever is longer).

Sensor

The sensor contained in the device is covered under a two-year limited warranty.

Battery

All batteries supplied by Otis Instruments, Inc. are covered, from ship date, under a 90-day warranty.



Otis Instruments, Inc.

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Bryan, TX 77802
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www.otisinstruments.com

Revision 2.1w

Data Sheet

Model OI-WF690 WireFree Sensor Assembly

OTIS INSTRUMENTS INC.

DESCRIPTION

The Otis Instruments, Inc. WireFree Model OI-WF690 Sensor Assembly is an innovative wireless gas detection system designed to monitor gas in hostile environments without the use of wires or conduit from the controller to the EC sensor.

The OI-WF690 is self-contained and battery operated. The sensor functions by transmission of radio wave messages to the Relayer OI-WF752, Interface OI-WF985, ProSafe OI-WF784, or any other compatable receiving controller. The device is field adjustable for background gas and addressable to eliminate interference with other systems.

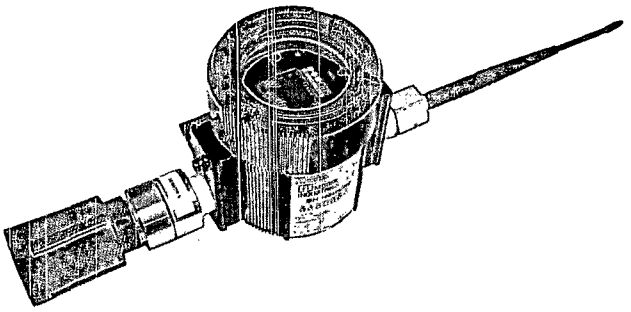
The OI-WF690 is Class I, Division 1 certified and can be calibrated non-intrusively by using an Otis Instruments, Inc. distributed magnet.

Features such as the relay/alarm tests and battery voltage indication make this device a truly remarkable gas detection system.

FEATURES

- Non-instrusive calibration with MENU, ADD and SUB
- Glass lid for viewing amplifier display
- Explosion and weather proof Moore enclosure
- Rapid response and clearing time
- Rain/splashguard for sensor protection

PRODUCT PHOTO



SPECIFICATIONS

Sensor Type:	Electro-Chemical '4' Series
Battery Type:	Lithium 8.5AH w/ connector
Battery Voltage:	3.6 VDC
Radio Wave:	900 MHz Spread Spectrum
Unit Address:	1-255
Background Adj:	1-20 PPM
Certification:	Class I, Div. 1 Groups C & D
Enclosure:	Moore Explosion Proof
Warranty:	Device: 1 Year (limited) Battery: 90 Days Sensor: 2 Year (limited)

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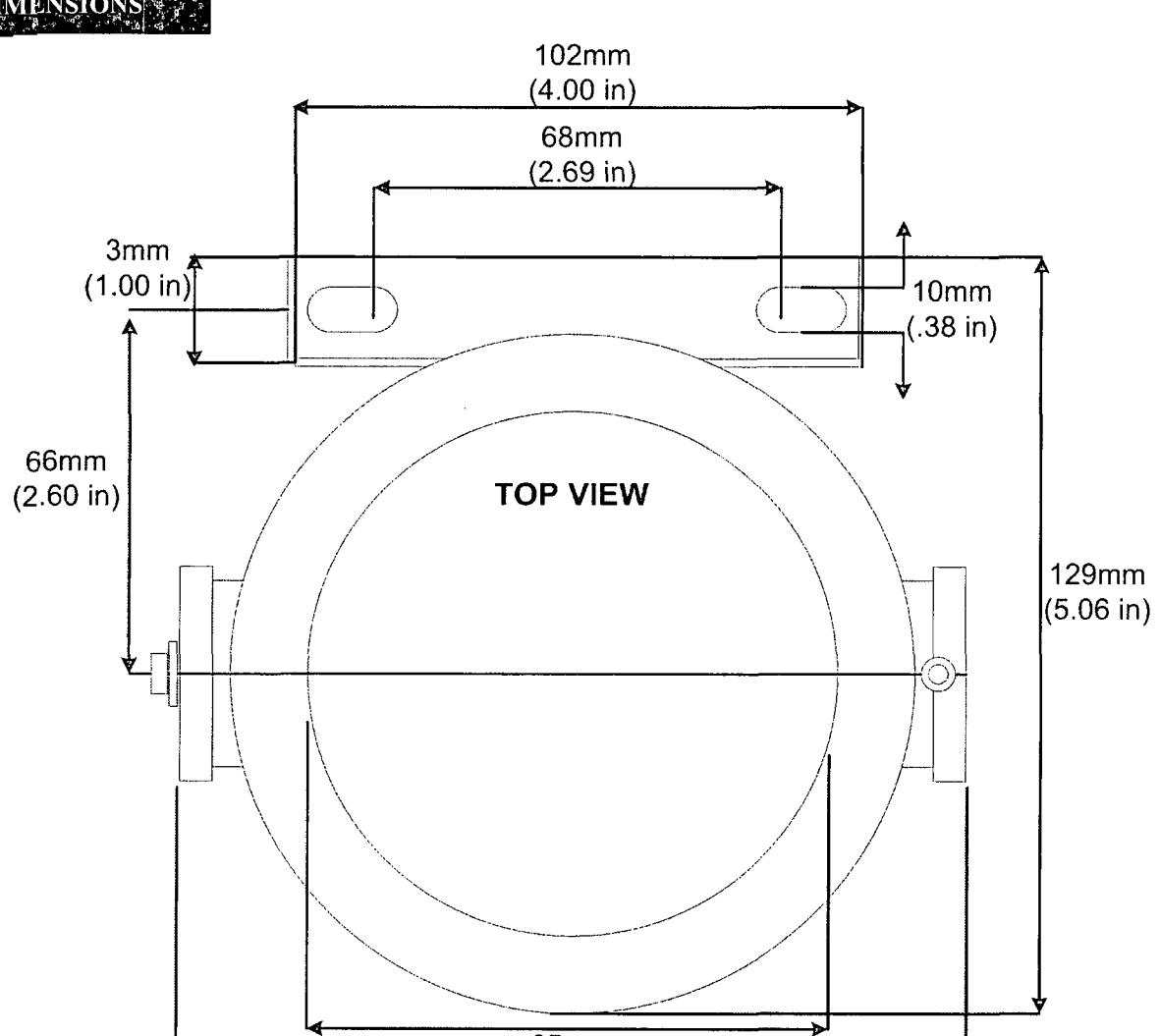
www.otisinstruments.com

DIMENSIONS



UNIT DEPTH
119mm
4.70 in.

Revision 2.0

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RESOURCE WEST
Applied H_2O Solutions

Resource West and Western Pump & Dredge
Wind Station Set Up Instructions

Setting up the tripod and wind pole.

The first step in setting up your wind station is to set up your tripod and wind pole. Unfold your tripod and slide the wind pole down thru the center of the tripod. Next turn the tripod until the marking arrow faces the pit. This should line up the 0 degree hash mark on the wind vane facing towards the pit. Next mount the wind station to the pole with supplied bracket. Connect your communication cable from the pole to the wind station, and then use the separate communication wire from the wind station to the control box.

Connecting the Wind Station to the Generator

We prefer to connect the wind station to 110 volt power which can be found inside the main evaporator control box. There is a transformer that supplies 110 voltage to the switch and hour meter that we can tie into. This may require drilling a hole and installing a cord grip for a 14/2 gage wire with ground cable. After you verify the voltage and have connected to the main control box you will need to turn on the breaker for the main control box. The Wind station should now have power. Make sure the control box is in auto mode and turn the Wind Station to ON after you have set all your parameters. The unit should start up on its own. Make sure you have set the correct parameters; refer to the logo programming guide.

Logo Programming Instructions for Wind Speed and Wind Direction

After powering up the wind station, press the down arrow until the date and time screen is shown then push the blue **esc (escape)** button. This should bring up the Set parameter screen as shown below.

> Stop
Set parameters
Set...
Program Name

To proceed scroll down to "Set Parameters" line with the down arrow key.

Stop
>Set parameters
Set...
Program Name

To change the settings for your parameters push the blue **OK** button to go to your next screen which should read "On speed".

On Speed
On=0
Off=x
Ax=x

This screen tells you the speed the wind needs to decrease to before the evaporator pump will turn back on after a high wind speed shut down. Off=X will be the only number that we will be adjusting. **On** should all ways = 0 and **Off** should = the speed you wish to turn the evaporator back on after high wind. Ax = your actual wind speed at that present time. To set this setting press OK, your screen should change to the Programming Screen. You will need to scroll continuously with the right arrow button to get from On=+00000 to >off=+0000 as shown below. Again, On=+00000 needs to remain at 0. Your settings should **ALWAYS BE +** Not – as shown below.

On Speed
On=+00000
>off=+00000
Ax=00000

To adjust the off parameter you will use the up or down arrow button. You always start with your right most numbers. Below is an example of the off setting if you wanted the evaporator to come back on after a high wind shut down of 3 miles per hour. The number in red is the number that has been adjusted.

on speed
On=+00000
Off=+00003
Ax=00000

Once you are done press OK and you will return to the on speed screen. From here scroll up with the arrow button to the next screen that will read... "Offspd".

Offspd
On=X
Off=X
Ax=X

This is the setting for turning off the evaporator in a high wind situation. Press OK then set the on and off speed to the same number. Here is an example. Both On and Off must be set the same.

On=+00015
Off=+00015
Ax=X

After setting your desired wind speed, press esc to return to the "offspd" screen. Proceed using the up arrow to scroll to the next screen. It will read:

zone1dir
On=0
Off=0
Ax=0

This screen creates the zones to enable you to turn the evaporator on and off with the wind directional vane. The wind vane detects the direction the wind is blowing on a 0^{o}-360^{o} clockwise scale. This allows the evaporator to be turned off if the wind is blowing from an undesirable direction. To adjust these parameters press OK. Manual manipulation of the wind vane will show the degree setting on the Ax line of the screen. The first setting (On=?) will set up the left hand side of your zone to turn the evaporator on. Turn the wind vane until it points at the area you want the unit to turn on. Then read the number displayed on the "Ax" line. This would be the number used for your "on" parameter. The second setting (off=?) will set up the right side of the zone to the turn the evaporator off. Turn the vane towards the right side of the pit and get the "Ax" line reading for your "off" parameter. After setting your zones press esc to return to the "zone1dir" screen.

Proceed using the up arrow to scroll to the next screen. This screen should read "On delay".

On delay
T=30:00s
Ta=00;00

This is the timer that turns the evaporator on after the wind has slowed down to the speed programmed previously in the On Speed screen. To adjust this timer press OK and use the arrow buttons to enter the desired time. When you are done press OK and the "On Delay" screen will reappear.

Proceed using the up arrow to scroll to the next screen. The "outwindT" screen should appear as shown below.

outwindT
T=30:00s
Ta=X

The outwindT delay timer is used to turn the evaporator off after the wind has been blowing above your "off speed" for this amount of time. This delay time is what we are programming with this screen. To adjust this time first push OK, then use the arrow buttons to enter the desired time. When done press OK and the "outbound" screen will reappear.

Proceed using the up arrow to scroll to the next screen. This screen should read "Dir on".

Dir on
T=
Ta=00:00

This is the delay timer that turns the evaporator on when the wind vane comes back into parameters. The purpose of this timer is to avoid having the evaporator turn off too frequently with short, high gusts of wind. To adjust this time first push OK, then use the arrow buttons to enter the desired time. Press OK and the "Dir on" screen will reappear.

To proceed to the next screen use the up arrow to scroll to the next screen. This screen should read "Dir off"

dir off

T=_____
Ta=00;00

This is the delay timer that turns the evaporator off when the wind vane goes out of direction. The purpose of this timer is to avoid having the evaporator turn off too frequently with short, high gusts of wind. To adjust this time first push OK, then use the arrow buttons to enter the desired time. Press OK and the "Dir off" screen will reappear.

Proceed using the up arrow to scroll to the next screen. This screen should read "Overtime1"This is a preset timer that we suggest you do not change!

Proceed using the up arrow to scroll to the next screen. This screen should read "OverRoff"(over ride off).

This override setting will let the system come back on and blow out of it's parameters until it hits this mph setting. The override setting is the maximum wind speed you would want it to run at while the wind is blowing out of its parameters. The screen below is a sample of a default settting.

overRoff
On=+00000
Off=+00007
AX=+00000

To change this parameter setting hit OK and adjust only the off =X setting. See below for example which shows an off speed of 8 mph. After this adjustment is made press OK to return to the overRoff shown above.

overRoff
On=+00000
Off=+00008
AX=+00000

Now you are ready to start your program make sure the unit is completely connected to the pump and you should be able to start your system.
The next page gives you definitions of the headings and the sequence of settings in a shorter overview.

RESOURCE WEST
Applied H_2O Solutions

Resource West and Western Pump & Dredge
Wind Station Program Parametors

On Speed screen #1
On Speed
On=+00000 (needs to be set at 0)
Off=+00___
Ax=00000

Off speed screen #2.
Both on & off must be set the same here.
Offspd
On=_____
Off=_____
Ax=X

Zone 1 dir screen #3
zone1dir
On=_____
Off=_____
Ax=0

On delay screen#4 ie. T=30:00s
On delay
T=_____
Ta=00:00

1. To change parameters you need to scroll down with the down arrow to the time and date screen, then push esc.
2. Next scroll down to set param and push ok.

OutwindT screen #5 ie. T=30:00s
outwindT
T=_____
Ta=X

Dir on screen#6 ie. T=10;00s
dir on
T=_____
Ta=00:00

Dir off screen #7 ie. T=10:00s
dir off
T=_____
Ta=00;00

Overtime1 screen#8
Ignore DO NOT CHANGE

OverRoff screen #9
overRoff
On=+00000 (needs to be set at 0)
Off=+00___
AX=+00000

3. Then use the up arrow to scroll through these screens.
4. To adjust each parameter push ok and use the arrow keys.
5. Push esc when you have made your adjustment and go to the next screen.

Definitions of the Headings

On Speed - This screen tells you the speed the wind needs slow down to before the evaporator will turn back on after a high wind speed shut down.

Offspeed - This is the setting for turning off the evaporator in a high wind situation. Press OK then set the on and off speed to the same number.

zone1dir - This screen creates the zones to enable you to turn the evaporator on and off with the wind directional vane. The wind vane detects the direction the wind is blowing on a 0^{o}-360^{o} clockwise scale. This allows the evaporator to be turned off if the wind is blowing from an undesirable direction.

On delay - This is the delay timer that turns the evaporator on after the wind has slowed down to the speed programmed previously in the On Speed screen.

outwindT - The outwindT delay timer is used to turn the evaporator off after the wind has been blowing above your "off speed" for this amount of time. This delay time is what we are programming with this screen.

Dir on - This is the delay timer that turns the evaporator on when the wind vane comes back into parameters. The purpose of this timer is to avoid having the evaporator turn off too frequently with short, high gusts of wind.

Dir off - This is the delay timer that turns the evaporator off when the wind vane goes out of direction. The purpose of this timer is to avoid having the evaporator turn off too frequently with short, high gusts of wind.

Overtime1 - Ignore this setting it is a preset timer.

overROFF {over ride off} - This override setting will let the system come back on while the wind is blowing out of it's direction parameters until the wind hits this mph setting. The override setting is the maximum wind speed you would want to blow and still run the evaporator even though the wind is blowing out of its direction parameters

Trouble shooting

Make sure all your setting our correct ex. Off speed both on and off have to me the same number.
Your on speed must be lower than your off speed.
Make sure cables and electrical wire connections, in junction box is secure.
The connections at the wind vane and anemonitor under the rubber sleeve is secure.
Check for corrosion under the rubber sleeve.
Data cable could be not working cut or no power. Make sure the cable female and male get tighten up correctly could be a short.
Make sure your on switch.
Control panel or the pump is on auto.
Make sure the tripod is positioned correctly with the zero pointing opposite of the pit.

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.C
POND INTEGRITY/LEAK DETECTION INSPECTION FORM

Attachment II.1.C
Basin Disposal, Inc.
Oil Waste Evaporation Basins

Pond Integrity/Leak Detection Inspection Checklist

Page _____ of _____

Date: _____ Inspector(s): _____

Time: _____ _____

Weather:

Temperature _____ deg. F Precipitation (last 24 hours) _____ inches

Skies _____

Wind Speed _____ mph

Wind Direction _____ *(direction blowing from)*

NOTES:
"X" indicates that a Deficiency has been noted. "P" indicates that a Photograph has been taken. "S" indicates that a Sample has been collected. Complete descriptions of Deficiencies, Photographs, and Samples are provided on attached pages. Items are referenced by Location.

Pond Condition

Location	Item			
	Erosion	Vegetation Established	Vectors	Sample

Leak Detection System

Riser #	Deficiency	
	Depth of H_2O	Structural Defect

NOTES: _____

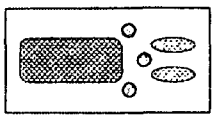
_____

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 1: OPERATIONS, INSPECTION AND MAINTENANCE PLAN

ATTACHMENT II.1.D
DAILY PLANT OPERATIONAL INSPECTION FORM

BASIN DISPOSAL, INC.
DAILY PLANT OPERATIONAL INSPECTION



YEAR 2008 MONTH_____ WEEK BEGINNING_____

EMPLOYEES SHALL PERFORM A ROUTINE INSPECTION AT THE BEGINNING OF EACH SHIFT :

SERVICE PUMPS:
A. CHECK CHARGE PUMP OIL AND FOR LEAKS, INITIALS IN BOX
B. CHECK POND PUMP OIL AND SPIDER COUPLER, INITIALS IN BOX
C. CHECK MURPHY SWITCHES FOR CORRECT SETTING, BLOW OUT HOSES, INITIALS IN BOX
D. CHECK STUFFING BOXES AND PACKING OIL LEVEL, INITIALS IN BOX

EQUIPMENT CHECKS:
A. CHECK ELECTRICAL CORDS ON WEEKEND FOR DAMAGE, INITIALS IN BOX
B. CHECK FIRST AID KIT ON WEEKEND INITIALS IN BOX, INFORM MGR
C. CHECK FIRE EXTINGUISHERS ON WEEKEND, INITIALS IN BOX
D. CHECK ON WEEKEND FOR LOW SUPPLIES, INITIALS IN BOX
E. CHECK BOBCAT, PRIOR TO USE, INITIALS IN BOX
F. CHECK LOADER, PRIOR TO USE,INITIALS IN BOX
G. CHECK FILTERS & FILTER POT FOR LEAKS AND PRESSURE,INITIALS IN BOX

LOOK FOR SPILLS:
A. CHECK GROUND FOR OIL
B. IF ANY ARE FOUND CLEAN IMMEDIATELY
C, NOTIFY SUPERVISOR IMMEDIATELY

INSPECT FOR LEAKS:
A. TIME AND INITIALS IN BOX
B. PRODUCTION TANKS, VALVES, HOSES , PUMPS
C. UNLOADING TANKS AND DOCK FOR OIL
D. FUEL TANKS, CHEMICAL STORAGE TANKS

INJECTION VOLUME:
A. AM SHIFT, NOTE TIME AND INITIALS IN BOX
B. PM SHIFT, NOTE TIME AND INITIALS IN BOX

PRESSURES:
A. PUMP PRESSURE
B. WELL HEAD PRESSURE
C. TIME AND INITIALS IN BOX

CONOCO METER:
A. READING
B. TIME AND INITIALS IN BOX

FILTER CHANGES:
A. FILTER SIZE, TIME AND INITIALS IN BOX

Date	Sun	Mon	Tues	Wed	Thu	Fri	Sat
Pumps							
Charge Pump AM							
Charge Pump PM							
Pond Pump AM							
Pond Pump PM							
Murphy Switches AM							
Murphy Switches PM							
Stuffing Boxes,Packing Oil AM							
Stuffing Boxes,Packing Oil PM							
Equipment							
Electrical Cords							
First Aid Kit							
Fire Extinguishers							
Bobcat							
Loader							
Filter Pots AM							
Filter Pots PM							
Spills							
Results/Action Taken							
Stormwater Check							
Results/Action Taken							
Leaks							
Production Tanks, Valves							
Hoses and Pumps							
Unloading Dock							
Fuel & Chemical Tanks							
Injection Volume							
AM Shift Reading							
Initals and Time							
PM Shift Reading							
Initals and Time							
Pressure							
Well Head Pressure							
Conoco Meter							
Reading							
Filter Changes							
5um							
5um							
5um							
5um							
5um							
20um							
20um							
20um							
20um							
20um							
Fencing							
Integrity Check							
Manager Verification							

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ATTACHMENT II.1.E
LEAKAGE THROUGH LINERS CONSTRUCTED WITH GEOMEMBRANES – PART 1 GEOMEMBRANE LINERS

Attachment II.1.E

Title: Leakage Through Liners Constructed with Geomembranes - Part 1. Geomembrane Liners

Written by: J.P. Giroud and R. Bonaparte
Published in: Geotextiles and Geomembranes **Volume:** 8 **Issue:** 2 **Pages:** 27 to 67
Phone: +31 20-485-3757 ~ **Web Site:** http://www.elsevier.com

How impermeable are 'impermeable liners'? All liners leak, including geomembranes, but how much? What are the mechanisms of leakage through liners constructed with geomembranes? To answer these questions, a detailed review of leakage mechanisms, published and unpublished data, and analytical studies has been carried out with the goal of providing practical design recommendations. In particular, it appears that a composite liner (i.e. geomembrane on low-permeability soil) is more effective in reducing the rate of leakage through the liner than either a geomembrane alone or a soil liner (low-permeability soil layer) alone. However, the paper shows that the effectiveness of composite liners depends on the quality of the contact between the geomembrane and the underlying low-permeability soil layer.

Table 1
Calculated Leakage Rates Due to Pinholes and Holes in a Geomembrane

	Water depth on top of the geomembrane, h_w					
	Defect Diameter	0.003 m (0.01 ft)	0.03 m (0.1 ft)	0.3 m (1 ft)	3 m (10 ft)	30 m (100 ft)
Pinholes	0.1 mm (0.004 in)	0.006 (0.0015)	0.06 (0.015)	0.6 (0.15)	6 ((1.5))	60 (15)
	0.3 mm (0.012 in)	0.5 (0.1)	5 (1)	50 (13)	500 ((130))	5000 (1 300)
Holes [a]	2 mm (0.08 in)	40 (10)	130 (30)	400 (100)	1300 (300)	4000 (1 000)
	11.3 mm (0.445 in)	1 300 (300)	4 000 (1 000)	13 000 (3 000)	40 000 (10 000)	130 000 (30 000)
	Values of leakage rate in liters/day (gallons/day)					

Table 2
Calculated Unitized Leakage Rates Due to Permeation of Water Through an HDPE Geomembrane

	Water depth on top of the geomembrane, h_w					
	0 m (0 ft)	*0.003 m (0.01 ft)*	*0.03 m (0.1 ft)*	*0.3 m (1 ft)*	*3 m (10 ft)*	*>10 m (>30 ft)*
Coefficient of migration, m_g(m^2/s)	0	$9x10^{-20}$	$9x10^{-18}$	$9x10^{-16}$	$9x10^{-14}$	$3x10^{-13}$
Unitized leakage rate,q_q (m/s)	0	$9x10^{-17}$	$9x10^{-15}$	$9x10^{-13}$	$9x10^{-11}$	$3x10^{-10}$
(lphd)	0	$8x10^{-5}$	0.008	0.8	80	260
(gpad)	0	$8x10^{-6}$	0.0008	0.08	(8)	28

Notes: These values of utilized leakage rates were calculated using eqn (5) and assuming a geomembrane thickness of 1 mm (40 mils). The coefficients of migration used to calculate the unitized leakage rates in this table were obtained from eqns (19) and (20), with $C_1 = 1x10^{-22}$ m^4 $kg^{-2}s^3$, $n = 2$, and $m_{gmax} = 3x10^{-13}$ m^2/s.

The water depths used here correspond to the typical values defined in Section1.3.6. (To use eqn (19), it is necessary to know the pressure difference, Δp. According to eqn (1), water depths, h_w, are approximately equal to hydraulic head differences, Δh, which are related by eqn (12) to pressure differences, Δp.)

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SECTION 2: OIL FIELD WASTE MANAGEMENT PLAN

1.0 PURPOSE

This Oil Field Waste Management Plan (WMP) addresses the requirements of 19.15.36.13, 14, 15, and 17, and establishes an internal control program that will be followed by Basin Disposal, Inc. (BDI) to ensure that oil field wastes receive attention commensurate with the associated risk.

The purpose of this WMP is to provide a waste identification, tracking and screening mechanism for Oil Conservation Division (OCD) waste that may require special handling to meet regulatory requirements and/or to protect employee health and safety. This WMP also establishes a waste identification and exclusion program for regulated, non-exempt, hazardous waste and non-exempt naturally occurring radioactive materials (NORM) that prevents these materials from processing at BDI. The oil field wastes discussed in this plan will be limited to those that have specified disposal requirements as described in Sections 13, 14, 15, and 17 of 19.15.36 NMAC and 19.15.35.8 NMAC.

Specifically, this plan is intended to address the handling and disposal procedures for the following oil field waste types which include, but are not limited to:

1. Produced waters as described in 19.15.36.17; and
2. C (1), (2), and (3) waste as described in 19.15.35.8.C.

The 8.C waste applies to oil field waste generated at the BDI facility as a result of processes and normal maintenance activities. Upon approval from the OCD, this waste will be transported to permitted facilities such as the San Juan County Landfill or the Bondad Landfill in Colorado for disposal.

2.0 OIL FIELD WASTE ACCEPTANCE PROGRAM

An acceptance decision to approve or disapprove oil field waste management will be clearly documented for each oil field waste stream BDI is requested to manage. At a minimum, the following requirements must be met prior to managing oil field waste at BDI:

Table II.2.1
Waste Acceptance Protocol

1. The commercial or industrial customers are required to provide a valid "Authorization To Move Produced Water", C-133 form **(Attachment II.1.A).** After producing the C-133, BDI will verify the customer is an authorized hauler by checking it against the OCD quarterly updated list at http://www.emnrd.state.nm.us/ocd/Statistics.htm. BDI will follow the following protocol in managing the C-133 form:

   a) Quarterly, the General Manager shall provide the plant personnel an updated list.
   b) The C-133 list shall be maintained in the Plant Manager's filing cabinet.
   c) Prior to accepting water, plant personnel shall ensure that the hauling company has a valid C-133 approval.
   d) Since all haulers that have frequented Basin Disposal in the past have already been verified, the verification will likely only be necessary for new haulers.
   e) If a valid C-133 is not on file, the hauler shall not be allowed to unload the liquid waste.
   f) The Plant Manager or General Manager will be contacted if assistance is needed

2. The customer must provide to BDI Form C-138, Generator Certificate of Waste Status (**Attachment II.2.B**) certifying the waste is exempt oil field waste. In addition, the generator, or their authorized representative, will be required to sign the BDI Disposal Ticket, SJRP Form 168-7 or similar (**Attachment II.2.C)** which contains the following certification:

   I do hereby certify that, according to the Resource Conservation and Recovery Act (RCRA) and Environmental Protection Agency's July, 1988, regulatory determination, any and all waste delivered to Basin Disposal Inc. from the above locations is: EXEMPT oilfield waste. This waste is in compliance with Regulated Levels of Naturally Occurring Radioactive Material (NORM) pursuant to 20 NMAC 3.1 Subpart 1403.C and D.

   Should the generator or their authorized representative fail to sign the BDI ticket, the load of oil field waste will be rejected.

3. BDI will notify the customer of all necessary conditions/limitations that apply to managing the waste, and the customer will be required to comply with all conditions/limitations.

2.1 Prohibited Wastes

Regulated non-exempt hazardous waste, and non-exempt NORM wastes which are subject to other U.S. or State regulations, are prohibited at BDI. Generators with these wastes will be referred to a RCRA permitted facility.

2.2 Oil Field Waste Inspection and Handling

Each load after clearing the required paperwork verification stage, will be inspected to ensure compliance with 19.15.36.13.F. Inspections consist of:

1. Examination of Fluid from Cap(s)
   a) All loads shall be checked prior to acceptance to check for the presence of non-permitted materials (such as, compressor oil) and to determine the solid content of the load (i.e. is the load "clean" or "dirty" for the purposes of proper handling.
   b) Every truck shall stop at the inspection landing (shown below).

c) Basin personnel shall not step onto the truck until the driver has placed the truck in park with the brake applied, opened the door, and has his/her legs outside the cab. This is to ensure the truck does not move while Basin personnel are on the truck.

d) Basin personnel shall wear neoprene or other heavy duty non-permeable gloves.

e) The cap shall be opened and the metal rod inserted to the bottom of the tank.

f) Care shall be exercised as H_2S may be present when the cap is opened. If there is any indication that H_2S may be present, the H_2S safety procedure shall be followed (**Volume II, Section 3**).

g) Based on whether the rod contacts the metal bottom of the tank or is slowed by sludge/solid material, Basin personnel will be able to gauge if the load may potentially be laden with sediment.

h) The metal rod shall be pulled out from the tank and the fluid on the rod examined for the presence of oils or other non-exempt materials.

i) Odor can also be an indication if the load contains fluids that are non-exempt. Non-exempt waste with potential odors include:

   a. Septic conditions
   b. Caustic or acid cleaners
   c. Methanol, unused
   d. Pesticide and herbicide wastes
   e. Solvents, spent (including waste solvents)

2. Presence of H_2S

a) In the event H_2S is suspected, one of the H_2S monitors shall be used to determine the concentration (refer to specific owner's manual for operation instructions).

b) The battery and calibration date shall be checked to ensure both are current.

c) The tube wand shall be used to acquire a sample.

d) Remaining as far away from the cap opening is essential to minimize the potential for exposure. Safety is the most important consideration when checking for H_2S.

e) If H_2S is noted, the driver shall contact his firm to determine if the company wants Basin to treat the load.

f) The truck will "roll" the load for 15-30 minutes (trucks use their air pumps to "roll" air through the tank to allow for mixing of the contents and the added calcium hypochlorite) and be tested again. Treatment will continue until the H_2S reading is below 1 ppm.

g) BDI will contact the Plant Manager or General Manager if assistance is needed.

3. Presence of Non-Exempt fluids
   a) In the event compressor oil or other non-exempt fluids, a sample of the fluid shall be collected in a white Styrofoam cup.
   b) The date, company, hauler, and location shall be noted on the cup.
   c) The load shall be prevented from unloading at Basin Disposal.
   d) BDI will contact the Plant Manager or General Manager if assistance is needed.
   e) Samples shall be maintained for two weeks on the shelves in the shop for inspection by the production company personnel.

4. Presence of High Solids Content
   a) In the event high solid/sludge content is suspected, a sample of the water shall be collected in a white Styrofoam cup.
   b) The date, company, hauler, and location shall be noted on the cup.
   c) If the load can be accepted with filtration, the driver shall contact the company for permission to be charged the normal price plus cost of filters.
   d) If the load cannot be accepted due to high solid content, the driver shall contact the company to inform them the load has been rejected.
   e) The load shall be prevented from unloading at Basin Disposal.
   f) BDI will contact the Plant Manager or General Manager if assistance is needed.
   g) Samples shall be maintained for two weeks on the shelves in the shop for inspection by the production company personnel

5. Unloading
   a) Basin Disposal has 7 unloading stations (Tanks 1-6, Amigo pit)
   b) To minimize the chance for conflicts between trucks, only 5 trucks shall be allowed past the inspection platform at any one time.
   c) Trucks shall back up to the tank number as instructed by Basin personnel.
   d) Drivers shall connect their grounding straps to the grounding stakes at their specific tank.
   e) Trucks shall exit the facility as instructed around the back side of the shop building.
   f) Failure of drivers to follow these procedures shall be brought to the attention of Basin management for proper resolution with the hauling company.

2.3 Temporary Tanks

Upon OCD approval BDI may set temporary tanks for the storage of produced water in compliance with 19.15.36.13.F, or in an emergency the following protocol will be adhered to:

1. Tanks shall be placed in a lined and bermed area.
2. The tanks shall be inspected twice per day – during the morning and afternoon facility rounds to verify that the tanks are not leaking and/or there is no standing water in the lined and bermed area
3. Water shall be transferred from the pond to the tanks individually using a gasoline powered pump and 4" hose.
4. The hose and pump shall be placed inside a lined and bermed corridor that is at least 1.5' high running the length from the pond to the tank storage area to ensure no spills to the ground can occur.
5. Water pulled from the pond, will be filtered prior to being placed into the tank using 10um polypropylene filters to ensure sludge and oil do not enter the tanks to avoid H_2S formation in the tanks.
6. When water is being pumped between the pond and a tank, the activity shall be continually supervised by a BDI employee.
7. When the tanks are to be emptied, water will be pumped in the same manner back to the pond. Water from the pond is pumped through a set of filters prior to being injected into the Class II disposal well.
8. When water is pumped from the tanks to the pond, hand-held H_2S monitors shall be used to determine if H_2S has developed in the storage tank.
9. If H_2S is detected, additional bleach or sodium chlorite shall be added to the pond following the procedure in the H_2S Prevention and Contingency SOP (**Volume II, Section 3**).

2.4 Recordkeeping

Upon receipt of oil field waste, facility employees shall record the following into the BDI Disposal Log Book or similar (**Attachment II.2.D**).

- Generator
- Origin
- Date received
- Quantity
- Transporter
- Disposal location

Logbooks shall be maintained for a minimum of 5 years after operations at the plant have ceased. At the end of each month, the General Manager shall compile information to be submitted electronically for the C-115 (**Attachment II.2.E**) report to the OCD.

2.5 Site Generated Waste

Certain wastes generated by BDI as a result of routine operations and maintenance will meet the definitions of 19.15.35.8. The anticipated list along with the testing requirements and final disposition is presented below:

Table II.2.2
Testing Requirements

Description	Testing Requirements	Disposal Location
C(1) Waste	None	San Juan County LF
C(2) Waste		
Junk pipe, valves, metal pipe	NORM	San Juan County LF
Pipe scale and other deposits	TPH,TCLP metals, NORM	San Juan County LF
Produced water filters	Corrosivity	San Juan County LF
C(3) Waste		
Other waste	As determined by Division	San Juan County LF
Petroleum contaminated soils (PCS)	Chloride, Paint filter, TPH, BTEX	Enviro Tech Landfarm Industrial Ecosystems
Sludges	Chloride, Paint filter, TPH, BTEX	Enviro Tech Landfarm Industrial Ecosystems

Note:
While this list is not all inclusive, BDI will coordinate with the Division the proper handling and disposal requirement for the 19.15.35.8 NMAC C(2) and C(3) waste and approved disposal facilities.

3.0 TRAINING

BDI employees will be trained in the identification of oil field waste and excluded wastes on an annual basis. Spotters and/or equipment operators will be present at the facility when oil field waste is unloaded in order to check for unauthorized waste. In addition to the routine customer screening process, new customer oil field waste deliveries will receive increased supervision and scrutiny.

At a minimum, inspection personnel will be trained to identify suspicious wastes based on visual (and olfactory) characteristics in addition to the waste screening procedures outlined in **Section 2.2** of this Plan. Some of the items that they will be trained on include:

- Hazardous placarding or markings
- Proper form identification and use
- H_2S screening
- Non-exempt liquids recognition

- "Chemical" odors
- Excessive solids recognition
- Employee safety and PPE use
- Site-generated waste handling and disposal

Whenever a suspicious waste is identified, the facility inspection personnel will follow specific procedures that may include:

- Identifying the unacceptable waste by characteristic, estimated quantity, transport vehicle, and the names and addresses of those associated with the waste load
- Questioning the driver of the vehicle
- Reviewing existing generator paperwork
- Contacting the possible source and questioning the originator of waste pursuant to the regulations.
- Denying access to the vehicle
- Calling the Division and/or Hazardous Waste Bureau, whichever is applicable, as required.
- Using protective equipment
- Calling an emergency response agency if required
- Contacting laboratory support if necessary

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ATTACHMENT II.2.A

AUTHORIZATION TO MOVE PRODUCED WATER

FORM C-133

Submit a single copy to
Santa Fe Office

State of New Mexico
Energy Minerals and Natural Resources

Form C-133
Revised May 27, 2007

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

AUTHORIZATION TO MOVE PRODUCED WATER

Transporter Name_____

Address _____ Office Location (If different) _____

_____ _____

_____ _____

Phone Numbers(s)_____

State Corporation Commission Permit No._____

**Please attach a copy of the New Mexico Public Regulation Commission (PRC) Warrant for Transportation Services, if a corporation name or LLC has not been established with the PRC or a partnership has not been established with the New Mexico Secretary of State Office. In accordance with Section 51 of 19.6.2 NMAC, "the division may deny approval of a form C-133 if:*

(1) the applicant is a corporation or limited liability company, and is not registered with the public regulation commission to do business in New Mexico;

(2) the applicant is a limited partnership, and is not registered with the New Mexico secretary of state to do business in New Mexico;

(3) the applicant does not possess a carrier permit under the single state registration system the public regulation commission administers, if it is required to have such a permit under applicable statutes or rules; or

(4) the applicant or an officer, director or partner in the applicant, or a person with an interest in the applicant exceeding 25 percent, is or was within the past five years an officer, director, partner or person with an interest exceeding 25 percent in another entity that possesses or has possessed an approved form C-133 that has been cancelled or suspended, has a history of violating division rules or other state or federal environmental laws; is subject to a commission or division order, issued after notice and hearing, finding such entity to be in violation of an order requiring corrective action; or has a penalty assessment for violation of division or commission rules or orders that is unpaid more than 70 days after issuance of the order assessing the penalty."

NOTE: It is the responsibility of each holder of an approved Form C-133 to familiarize its personnel with the content of Sections 51 and 52 of 19.15.2 NMAC and to assure operations in compliance therewith. Failure to move and dispose of produced water in accordance with Sections 51 and 52 of 19.15.2 NMAC are cause for cancellation of Form C-133 and the authority to move produced water.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Signature_____ Date_____

Printed Name_____ Title_____

E-mail Address_____

(This space for State Use)

Approved by_____ Title_____

Date_____

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ATTACHMENT II.2.B

GENERATOR CERTIFICATE OF WASTE STATUS,

FORM C-138

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-138
Revised March 12, 2007

*Surface Waste Management Facility Operator and Generator shall maintain and make this documentation available for Division inspection.

REQUEST FOR APPROVAL TO ACCEPT SOLID WASTE

1. Generator Name and Address:

2. Originating Site:

3. Location of Material (Street Address, City, State or ULSTR):

4. Source and Description of Waste:

Estimated Volume _____ yd^3 / bbls Known Volume (to be entered by the operator at the end of the haul) _____ yd^3 / bbls

5. GENERATOR CERTIFICATION STATEMENT OF WASTE STATUS

I, _____, representative or authorized agent for _____ do hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is: (Check the appropriate classification)

☐ RCRA Exempt: Oil field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste. *Operator Use Only: Waste Acceptance Frequency ☐ Monthly ☐ Weekly ☐ Per Load*

☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24, or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items)

☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description in Box 4)

GENERATOR 19.15.36.15 WASTE TESTING CERTIFICATION STATEMENT FOR LANDFARMS

I, _____, representative for _____ do hereby certify that representative samples of the oil field waste have been subjected to the paint filter test and tested for chloride content and that the samples have been found to conform to the specific requirements applicable to landfarms pursuant to Section 15 of 19.15.36 NMAC. The results of the representative samples are attached to demonstrate the above-described waste conform to the requirements of Section 15 of 19.15.36 NMAC.

5. Transporter:

OCD Permitted Surface Waste Management Facility

Name and Facility Permit #:

Address of Facility:

Method of Treatment and/or Disposal:

☐ Evaporation ☐ Injection ☐ Treating Plant ☐ Landfarm ☐ Landfill ☐ Other

Waste Acceptance Status:

☐ **APPROVED** ☐ **DENIED** (Must Be Maintained As Permanent Record)

PRINT NAME: _____ TITLE: _____ DATE: _____

SIGNATURE: _____ TELEPHONE NO.: _____

Surface Waste Management Facility Authorized Agent

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ATTACHMENT II.2.C
BDI DISPOSAL TICKET
SJRP FORM 168-6
(OR SIMILAR)

BASIN DISPOSAL, INC.

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD
P.O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE (505) 632-8936

NO.
NMOCD PERMIT: NM -001-0005
Oil Field Waste Document, Form C138
INVOICE:

DATE _____ DEL. TKT#. _____

GENERATOR: _____ BILL TO: _____

HAULING CO. _____ DRIVER: _____
(Print Full Name)

ORDERED BY: _____ CODES: _____

WASTE DESCRIPTION: ☒ Exempt Oilfield Waste ☐ Produced Water ☐ Drilling/Completion Fluids ☐ Reserve Pit

STATE: ☐ NM ☐ CO ☐ AZ ☐ UT TREATMENT/DISPOSAL METHODS: ☒ EVAPORATION ☒ INJECTION ☒ TREATING PLANT

NO.	TRUCK	LOCATION(S)	VOLUME	AM	PM	COST	TOTAL	TIME
1								
2								
3								
4								
5								
					TOTAL			

I, _____ representitive or authorized agent for the above generator and hauler hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination that the above described waste is RCRA Exempt, Oil field wastes generated from oil and gas exploration and production operations and not mixed with non-exempt waste, per OCD's mixing policy.

☐ Approved ☐ Denied ATTENDANT SIGNATURE: _____

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 2: OIL FIELD WASTE MANAGEMENT PLAN

ATTACHMENT II.2.D

DISPOSAL LOG BOOK

SJRP FORM 168-7

ENTRY	TRUCK	DRIVERS NAME	TICKET #	TIME OUT AM / PM	ORIGIN	OPERATING COMPANY	WORK DESCRIPTION	DATE IN	TIME IN AM / PM	TRUCKING COMPANY
1				A.M. P.M.					A.M. P.M.	
2				A.M. P.M.					A.M. P.M.	
3				A.M. P.M.					A.M. P.M.	
4				A.M. P.M.					A.M. P.M.	
5				A.M. P.M.					A.M. P.M.	
6				A.M. P.M.					A.M. P.M.	
7				A.M. P.M.					A.M. P.M.	
8				A.M. P.M.					A.M. P.M.	
9				A.M. P.M.					A.M. P.M.	
10				A.M. P.M.					A.M. P.M.	
11				A.M. P.M.					A.M. P.M.	
12				A.M. P.M.					A.M. P.M.	
13				A.M. P.M.					A.M. P.M.	
14				A.M. P.M.					A.M. P.M.	
15				A.M. P.M.					A.M. P.M.	
16				A.M. P.M.					A.M. P.M.	
17				A.M. P.M.					A.M. P.M.	
18				A.M. P.M.					A.M. P.M.	
19				A.M. P.M.					A.M. P.M.	
20				A.M. P.M.					A.M. P.M.	
21				A.M. P.M.					A.M. P.M.	
22				A.M. P.M.					A.M. P.M.	
23				A.M. P.M.					A.M. P.M.	
24				A.M. P.M.					A.M. P.M.	
25				A.M. P.M.					A.M. P.M.	

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 2: OIL FIELD WASTE MANAGEMENT PLAN

ATTACHMENT II.2.E

OPERATOR'S MONTHLY REPORT

FORM C-115

District I
1625 North French, Hobbs, NM 88241

District II
1301 West Grand Avenue, Artesia, NM 88210

District III
1000 Rio Brazos, Aztec, NM 84710

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South Saint Francis Drive
Santa Fe, NM 87505

OPERATOR'S MONTHLY REPORT

Form C-115 First Page
Revised January 22, 2004
Instruction on Reverse Side
1 ☐ Amended Report

2 Operator	3 OGRID:	4 Month/Year
5 Address:		6 Page 1 of 4

		INJECTION			PRODUCTION				DISPOSITION OF OIL, GAS, AND WATER							
7 . AND NAME No. and Name & U-L-S-T-R PI No.	8 C O D E 1	9 Volume	10 Pressure	11 C O D E 2	12 Barrels of Oil/condensate produced	13 Barrels of water produced	14 MCF Gas Produced	15 Days Produced	16 C O D E 3	17 Point of Disposition	18 Gas BTU or Oil API Gravity	19 Oil on hand at beginning of month	20 Volume (Bbls/mcf)	21 Transporter Ogrid	22 C O D E 4	23 Oil on hand at end of month

I hereby certify that the information contained in this report is true and complete to the best of my knowledge.
24

Signature | Printed Name & Title | E-mail Address | Date | Phone Number

2 Operator	3 OGRID	4 Month/Year	6 Page 2 of 4

		INJECTION			PRODUCTION				DISPOSITION OF OIL, GAS, AND WATER							
7 . AND NAME No. and Name & U-L-S-T-R PI No.	8 C O D E 1	9 Volume	10 Pressure	11 C O D E 2	12 Barrels of Oil/conden-sate produced	13 Barrels of water produced	14 MCF Gas Produced	15 Days Prod-uced	16 C O D E 3	17 Point of Disposition	18 Gas BTU or Oil API Gravity	19 Oil on hand at beginning of month	20 Volume (Bbls/mcf)	21 Transporter Ogrid	22 C O D E 4	23 Oil on hand at end of month

2 rator	3 OGRID	4 Month/Year	6 Page 3 of 4

		INJECTION			PRODUCTION				DISPOSITION OF OIL, GAS, AND WATER							
7 . AND NAME No. and Name & U-L-S-T-R PI No.	8 C O D E 1	9 Volume	10 Pressure	11 C O D E 2	12 Barrels of Oil/conden-sate produced	13 Barrels of water produced	14 MCF Gas Produced	15 Days Prod-uced	16 C O D E 3	17 Point of Disposition	18 Gas BTU or Oil API Gravity	19 Oil on hand at beginning of month	20 Volume (Bbls/mcf)	21 Transporter Ogrid	22 C O D E 4	23 Oil on hand at end of month

2 rator	3 OGRID	4 Month/Year	6 Page 4 of 4

		INJECTION			PRODUCTION				DISPOSITION OF OIL, GAS, AND WATER							
7 . AND NAME No. and Name & U-L-S-T-R PI No.	8 CODE 1	9 Volume	10 Pressure	11 CODE 2	12 Barrels of Oil/condensate produced	13 Barrels of water produced	14 MCF Gas Produced	15 Days Produced	16 CODE 3	17 Point of Disposition	18 Gas BTU or Oil API Gravity	19 Oil on hand at beginning of month	20 Volume (Bbls/mcf)	21 Transporter Ogrid	22 CODE 4	23 Oil on hand at end of month

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ATTACHMENTS

Attachment No.	Title
II.3.A	MATERIAL SAFETY DATA SHEET FOR H_2S
II.3.B	BDI INSPECTION REPORT FORM
II.3.C	BDI DAILY AIR AND WATER INSPECTION REPORT FORM H_2S MONITOR
II.3.D	BDI INCIDENT REPORT FORM
II.3.E	OCD – RELEASE NOTIFICATION AND CORRECTION ACTION FORM C-141

SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

1.0 INTRODUCTION

1.1 Site Information

The Basin Disposal, Inc. (BDI) site is located in San Juan County just outside the city limits of Bloomfield, New Mexico approximately 3 miles north of the intersection of NM 550 and 64. Gated access to the site is provided off of Montana Street. A Site Location Map is provided as **Figure II.3.1**. BDI provides produced water processing and disposal services for the oil and gas industry customers. The BDI site consists of ±28 acres.

Facility Name and Address
Basin Disposal Inc.
200 Montana Street
Bloomfield, NM 87413
Contact: Mr. John Volkerding, Ph.D.
General Manager
Phone: (505) 632-8936

Facility Owner, Operator, and Permittee:
Basin Disposal Inc.
P.O. Box 100
Aztec, NM 87410
Contact: Mr. Jerry Sandel
President
Phone: (505) 632-8936

The site is comprised of an Oil Conservation Division (OCD) approved surface waste management facility consisting of ±28 acres. The permit (NM-01-0005) was issued by OCD in 1987 and is on a 10-year renewal cycle; and the current permit issued was for a major modification in May 1999. The north area of the facility will be utilized for two additional evaporation ponds. The Site Plan (**Figure II.3.2)** identifies existing features and potential improvements for the BDI site.

The existing site includes several active and proposed areas as shown on **Figure II.3.2**:

- Liquids receiving, processing, and disposal area (±28 acres).
- Receiving tanks (12). (Modified site to increase tanks to 18)
- Skimmed oil tanks (3).
- Oil heating tanks (3).
- Oil sales tanks (7). (Modifying site to increase tanks to 9)
- Oily water receiving tanks (3).
- Clean water tanks (4).
- Bleach tanks (4).
- Evaporation pond (1) (Modified to include Ponds 2 and 3).
- Injection well system (1)
- Sludge setting tanks (2)

SITE LOCATION MAP

SURFACE WASTE MANAGEMENT FACILITY
BASIN DISPOSAL, INC.
SAN JUAN COUNTY, NEW MEXICO

Based on:
FLORA VISTA, NM (1963, PHOTOREVISED 1979),
HORN CANYON, NM (1965 PHOTOREVISED 1979),
AZTEC, NM (1985 PROVISIONAL EDITION), AND
BLOOMFIELD (1985 PROVISIONAL EDITION),
USGS 7.5' SERIES (1:24,000 SCALE TOPOGRAPHIC) QUADRANGLES.

Drawing:P:\acad 2003\520.01.01\02\FIGURES\SITE LOCATION 24K.dwg
Date/Time:Oct. 27, 2008-09:18:05

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 10/27/08	CAD: SITE LOCATION 24K.dwg	PROJECT #: 520.01.01
DRAWN BY: MLH	REVIEWED BY: IKG	FIGURE II.3.1
APPROVED BY: IKG	gei@gordonenvironmental.com	

BOREHOLE LOCATIONS	
BH–2	LAT 36°45'20.54269"N (NAD 83) LONG 107°59'02.70950"W (NAD83) ELEV: 5717.98 (GROUND)
BH–3	LAT 36°45'22.92950"N (NAD 83) LONG 107°59'04.21563"W (NAD83) ELEV: 5727.46 (GROUND)
AW–1	LAT 36°45'22.01797"N (NAD 83) LONG 107°58'55.15402"W (NAD83) ELEV: 5717.85 (TOP OF CAP)
AW–2	LAT 36°45'20.58589"N (NAD 83) LONG 107°59'02.96163"W (NAD83) ELEV: 5722.20 (TOP OF CAP)

LEGEND

- PROPERTY BOUNDARY
- 2' CONTOUR (EXISTING)
- 5700 — 10 CONTOUR (EXISTING)
- 2' DEPRESSION CONTOUR (EXISTING)
- 5700 — 10' DEPRESSION CONTOUR (EXISTING)
- ROADWAY (EXISTING)
- FENCE (EXISTING)
- PROPOSED NEW TANKS
- CULVERT
- STRUCTURE
- CONCRETE SLAB
- AW-1 ASSESSMENT WELL
- BH-3 BOREHOLE LOCATION
- TANKS
- LIGHT POLE (EXISTING)
- POWER POLE (EXISTING)
- 5705.6 × SPOT ELEVATIONS

NORTH

0 100' 200'

SITE PLAN

BASIN DISPOSAL, INC.
BLOOMFIELD, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 06/05/09	CAD: SITE PLAN.dwg	PROJECT #: 520.01.01
DRAWN BY: JFP	REVIEWED BY: MRH	FIGURE II.3.2
APPROVED BY: IKG	gei@gordonenvironmental.com	

1.2 Purpose

The purpose of the BDI H_2S Prevention and Contingency Plan is to enhance awareness and establish measures to protect Basin employees from occupational exposure to H_2S while allowing Basin employees to perform their duties and to protect the surrounding public areas.

This Hydrogen Sulfide Prevention Plan prescribes measures for:

- Provide routine H_2S monitoring of incoming wastes.
- Installation of monitoring points at the facility evaporation basins.
- Routine perimeter monitoring, if needed until permanent monitors are installed.
- Regular monitoring in and around incoming oil field waste transportation vehicles.
- Augmenting the monitoring procedures in the event that H_2S is detected in excess of 10 ppm.

BDI will invite the local authorities identified in **Table II.3.1** to the site for a briefing on this Plan. During this briefing BDI will discuss notification, emergency response procedures, and evacuation plans. The H_2S monitoring program will be implemented during the active life of the Facility.

1.3 Hydrogen Sulfide Characteristics

Hydrogen Sulfide (H_2S) is a colorless and flammable gas with a distinct odor. Being heavier than air, H_2S tends to accumulate at the floor of poorly ventilated spaces. It is found in petroleum and natural gas and is sometimes present in groundwater. The odor of hydrogen sulfide gas can be perceived at levels as low as 10 ppb (parts per billion). At levels of 50-100 ppm (parts per million), it may cause the human sense of smell to fail. Limited exposure to low concentrations of H_2S can result in eye irritation, sore throat, coughing, shortness of breath, and fluid in the lungs. These symptoms usually recede in a few weeks in the absence of continued exposure. Long-term, low-level exposure may result in fatigue, loss of appetite, headaches, irritability, poor memory, and dizziness. Exposure to high concentrations of H_2S can lead to eye damage, loss of sense of smell, pulmonary edema (swelling and/or fluid accumulation in the lungs), loss of breathing and death. General risks associated with H_2S contact are also described on **Table II.3.2**. More detailed chemical hazard information for H_2S is provided in **Attachment II.3.A**.

TABLE II.3.1
Emergency Response Agencies and Contacts
(Updated 08/2008)

Agency/Organization	Emergency Number
Fire	
Bloomfield Fire Department	911 or (505) 632-6363
Police	
San Juan County Sheriff's Department	911 or (505) 334-1180
New Mexico State Police	911 or (505) 325-7847
Medical/Ambulance	
San Juan Region Medical Center 801 West Maple Farmington, NM 88220	911 or (505) 325-5011
Response Firm	
Envirotech, Inc. 5796 Highway 64 Farmington, NM 87401	(505) 632-0615
OCD Emergency Response Contacts	
Oil Conservation Division	
1000 Rio Brazos Aztec, NM 87410	(505) 334-6170
Mobile Phone	(505) 320-0292
Oil Conservation Division	
1220 South St. Francis Drive Santa Fe, NM 87505	(505) 476-3440
State Emergency Response Contacts	
Hazardous and Radioactive Materials Bureau, Santa Fe	(505) 827-1557
Spill Emergencies 24 hr. Hotline (NMED)	(505) 827-9329
Other Local Emergency Response Contacts	
San Juan County Emergency Response	(505) 334-1180
Federal Emergency Response Contacts	
National Emergency Response Center (U.S. Coast Guard)	(800) 424-8802
Region VI 24 hr. Emergency Response Hotline (USEPA)	(214) 665-2222

TABLE II.3.2
H_2S Exposure Health Risk

H_2S EXPOSURE LEVEL[1]	HEALTH RISK
Low (0-10 ppm)	Eye, nose, and throat irritation; coughing, shortness of breath, fluid in the lungs
Moderate (10-50 ppm)	Headache, dizziness, nausea and vomiting, coughing and breathing difficulty, loss of sense of smell
High (50-200 ppm)[2]	Severe respiratory tract irritation, loss of sense of smell, eye damage, shock, convulsions, coma, pulmonary edema (swelling and/or fluid accumulation in the lungs), death

[1]*General data obtained from www.safetydirectory.com*
[2]*NIOSH Immediate Danger to Life or Health (IDLH) is 100 ppm*

The oil field waste types, and engineering design and operating procedures specific to the Basin Disposal, Inc (BDI) facility will mitigate the release of H_2S in to the environment. The factors which inhibit releases include:

- Screening of existing and new deliveries
- Load inspections for the presence of H_2S as outlined in the Oil Field Waste Management Plan (**Volume II, Section 2**)
- Onsite H_2S treatment of incoming loads to ensure acceptance criteria of no measurable H_2S (< 1ppm) is met
- Constant evaporation pond testing
- Employee training

The cornerstone of the Hydrogen Sulfide Prevention Plan for BDI consists of routine facility H_2S monitoring conducted for the evaporation ponds and incoming waste streams to ensure that the regulatory limits of H_2S are not exceeded. The monitoring is intended to confirm that H_2S concentration being accepted at the Facility is less than 1 ppm. This monitoring and treatment to-date has proven effective in reducing H_2S concentrations and eliminating the need for H_2S Plan implementation as described in 19.15.11.9 to address H_2S > 100 ppm and to follow API Recommended Practice 55 (RP-55), paragraph 7.6 to address H_2S > 30ppm **(Table II.3.3)**.

1.3 Regulatory Requirements: 19.15.36 NMAC and 19.15.3.118

The Surface Waste Management Facilities Regulations [19.15.36 NMAC] address the monitoring and management of H_2S in Sections 8.C.(8) and 13.N.

Table II.3.3
API Recommended Practice 55

7.6 IMMEDIATE ACTION PLAN

Each contingency plan should contain a condensed "Immediate Action Plan" to .be followed by designated personnel any time they receive notice of a potentially hazardous hydrogen sulfide or sulfur dioxide discharge. For the protection of personnel (including the general public) and abatement of the discharge, this "Immediate Action Plan" should include, but not be limited to, the following provisions:

a. Alert and account for facility personnel.
   1. Move away from the hydrogen sulfide or sulfur dioxide source and get out of the affected area.
   2. Don proper personal breathing equipment.
   3. Alert other affected personnel.
   4. Assist personnel in distress.
   5. Proceed to the designated emergency assembly area.
   6. Account for on-site personnel.

b. Take immediate measures to control the present or potential hydrogen sulfide or sulfur dioxide discharge and to eliminate possible ignition sources. Emergency shutdown procedures should be initiated as deemed necessary to correct or control the specific situation. When the required action cannot be accomplished in time to prevent exposing operating personnel or the public to hazardous concentrations of hydrogen sulfide or sulfur dioxide, proceed to the following steps, as appropriate for the site specific conditions.

c. Alert the public (directly or through appropriate government agencies) that may be subjected to an atmosphere exposure exceeding 30 ppm[21] of hydrogen sulfide or 10[21] ppm of sulfur dioxide.

d. Initiate evacuation operations.

e. Contact the first available designated supervisor on the call list (refer to Par. 7.4.a). Notify the supervisor of circumstances and whether or not immediate assistance is needed. The supervisor should notify (or arrange for notification of) other supervisors and other appropriate personnel (including public officials) on the call list.

f. Make recommendations to public officials regarding blocking unauthorized access to the unsafe area and assist as appropriate.

g. Make recommendations to public officials regarding evacuating the public and assist as appropriate.

h. Notify, as required, state and local officials and the National Response Center to comply with release reporting requirements (i.e., 40 *Code* of *Federal Regulations Parts 302* and 355) (refer to Par. 4.4).

i. Monitor the ambient air in the area of exposure (after following abatement measures) to determine when it is safe for re-entry.

[21]Emergency Response Planning Guide Level 2 (ERPG-2), refer to Reference 27. ERPG-2 is defined as the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action.

Note: This sequence (Par. 7.6) should be altered to fit the prevailing situation. Certain actions, especially those dealing with the public, should be coordinated with public officials.

This Table is extracted from the American Petroleum Institute (API) Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide, Recommended Practice 55, Second Edition, February 15, 1995

Additionally, this H_2S monitoring program described herein is intended to demonstrate compliance with Section 8.C.(8), and the requirements of 19.15.11 NMAC and other permit conditions that may apply to this Facility. Should monitoring results identify unexpected concentrations of H_2S in excess of 100 ppm (RP-55 limit = 30 ppm) in a public area, the requirements of 19.15.11.8.C will be implemented and a Hydrogen Sulfide Contingency Plan specific to 19.15.11.9 will be implemented as required.

2.0 EMERGENCY COORDINATORS

BDI has designated specific specialists with the responsibility and authority to implement response measures in the event of an emergency which threatens freshwater, public health, safety or the environment [19.15.36.13.N(3) NMAC]. The Primary, Alternate, and on-site Emergency Coordinators (ECs; **Table II.3.4**) will be thoroughly familiar with all aspects of this Plan; operations and activities at the facility; location and characteristics of waste to be managed; the repository of all records within the facility; and the facility layout. **Table II.3.4** lists the names, designations, titles, home addresses, and office, home, and cellular phone numbers for each EC.

TABLE II.3.4
List of Emergency Coordinators
(Updated 08/2008)

Primary Emergency Coordinator

Name:	John Volkerding, Ph.D.	Work Phone: (505) 334-3013
Title:	General Manager	Home Phone: (505) 327-1061
Address:	4105 Skyline	Mobile Phone: (505) 320-2840
	Farmington, NM 87401	

Alternate Emergency Coordinator*

Name:	Jimmy Barnes	Work Phone: (505) 632-8936
Title:	Plant Manager	Home Phone: (505) 324-1164
Address:	3925 Rochester Ave	Mobile Phone: (505) 486-3078
	Farmington, NM 87402	

Onsite Emergency Coordinator*

Name:	Jimmy Barnes	Work Phone: (505) 632-8936
Title:	Plant Manager	Home Phone: (505) 324-1164
Address:	3925 Rochester Ave	Mobile Phone: (505) 486-3078
	Farmington, NM 87402	

**Or as designated by BDI.*

The ECs are responsible for coordinating emergency response measures and have the authority to commit the resources required for implementation of this Plan. A designated EC is available to respond to emergencies 24 hours a day, 7 days a week. The BDI employee who identifies an emergency situation will contact an EC directly or via phone. Contact will be attempted with each EC (Primary, Alternate, and the On-site) until communication is achieved (**Table II.3.4**). Upon arrival at the scene of an emergency, the first EC to arrive will assume responsibility for initiated response measures. If more than one EC responds, authority is given to the highest-ranking EC.

In the rare case that an EC cannot be contacted in an emergency, the BDI employee who identifies the will should make every effort to follow the emergency procedures outlined in this Plan until an EC or emergency authority (local, state, or federal; **Table II.3.1**) arrives to assist. Duties of the ECs are addressed within this Plan in detail. The term "EC" as used throughout this Plan references the responsible EC at the scene of an emergency regardless of whether that EC is the Primary, Alternate or On-site EC, or designee. If the list of ECs changes, this Plan will be amended as described in Section 8.0 with updates timely submitted to OCD.

3.0 MONITORING

3.1 Incoming loads

BDI monitors for H_2S on a daily basis on every oil field delivery waste vehicle arriving at the site as described in the Oil Field Waste Management Plan. Monitoring results are recorded on an inspection report form or ticket (**Attachment II.3.B**) and retained as part of the facility operating record. BDI personnel wear H_2S personnel monitors under circumstances in which H_2S may be present, including when the unloading of materials that may contain H_2S. The monitors issue a visual and audible signal at 10 ppm of H_2S in the ambient air that becomes more rapid at 20 ppm. In the event of an H_2S detection of 10 ppm or greater, the following procedures will be implemented:

- Notification of the presence of H_2S will be provided to both the driver and the generator.
- The generator will be provided the option of allowing BDI to treat the load on-site, should the generator decline treatment the load will be rejected and must leave the facility.

- If the generator requests treatment, calcium hypochlorite (CaOCl) will be added to the load corresponding to **Table II.3.5.**
- Once the CaOCl has been added the load will be "rolled" (trucks use their air pumps to "roll" air through the tank to allow for mixing of the contents and the added calcium hypochlorite) to assist the chemical reaction. After 20 minutes, the load will be resampled for the presence of H_2S. Once the H_2S is below 1 ppm, the load will be directed to the receiving area for processing.

TABLE II.3.5
H_2S Treatment for Vehicles [1]

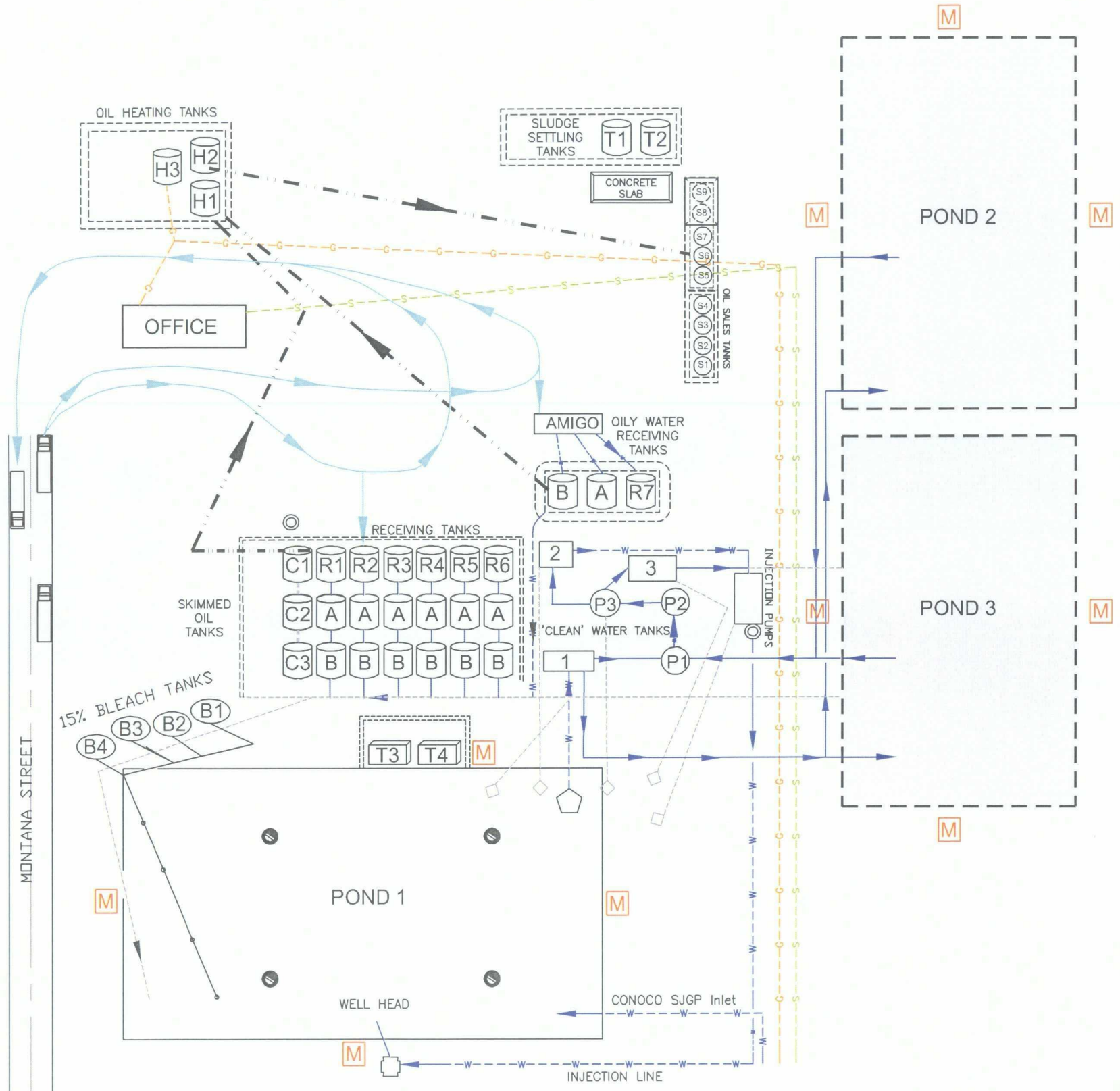
H_2S PPM	CaOCl Coffee Cans Required
<50	1.0
50-100	1.5
100-150	2.0
150-200	2.5
200-250	3.0
250-300	3.5
300-350	4.0
350-400	4.5
400-450	5.0
450-500	5.5
500-550	6.0
550-600	6.5
600-650	7.0
650-700	7.5
700-750	8.0
750-800	8.5
800-850	9.0
850-900	9.5
900-950	10.0
950-1000	10.5

1- Typical volume of truck is 80 bbl. One coffee can equals 34.5 oz of product.

3.2 Evaporation Pond Monitoring

3.2.1 Stationary Monitors

Evaporation ponds are monitored for the presence of H_2S by recording at four stationary continuous monitors maintained at each side of each pond (**Figure II.3.3**). These monitors are wired directly to the office for remote observation. H_2S readings and wind speed/direction are logged and recorded twice daily on the BDI Daily Air and Water Inspection Form (**Attachment II.3.C**). Should the reading of H_2S exceed an action level



NOTE: ELEMENTS ARE LABELED IN ACCORDANCE WITH THE UPDATED NOMENCLATURE (11/08, ATTANCHMENT III.1.F)

LEGEND

- SEWER
- GAS
- OIL
- WATER
- PROCESS FLOW DIRECTION
- DELIVERY VEHICLE ROUTE
- OVERFLOW
- LINED BERMS
- M — H_2S MONITORING LOCATION
- AERATOR
- PUMP
- EXISTING RECEIVING TANK
- EXISTING TANK
- SUMP
- STRUCTURE

NORTH

NOT TO SCALE

EVAPORATION POND STATIONARY MONITORING

BASIN DISPOSAL, INC.
BLOOMFIELD, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 06/05/09	CAD: PROCESS FIGS.dwg	PROJECT #: 520.01.01
DRAWN BY: JFP	REVIEWED BY: MRH	FIGURE II.3.3
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\520.01.01\FIGURES\PROCESS FIGS.dwg
Date/Time:Jun. 08, 2009-15:18:23

RECEIVED
AUG 27 2009
Environmental Bureau
Oil Conservation Division

above 1 ppm site personnel will notify the Emergency Coordinator who will implement the procedures outlined below; and if > 10 ppm the procedures in **Table II.3.6.**

- A second reading will be taken on the downwind berm within one hour
- The dissolved oxygen and dissolved sulfide levels of the pond will be tested immediately and the need for immediate treatment determined
- Tests for H_2S levels will be made at the fenceline downwind from the area of concern

If two (2) consecutive H_2S readings of 1 ppm or greater are recorded:

- The EC will notify the Aztec office of the OCD immediately **(Table II.3.1);**
- BDI will commence hourly monitoring on a 24-hour basis;
- BDI will lower the pond level so that the aeration system will circulate the entire pond
- BDI will obtain daily analysis of dissolved sulfides in the pond.

3.2.2 Dissolved Oxygen and pH Monitoring

Dissolved oxygen and pH levels are key indicators of the efficacy of treatment and removal of H_2S during the aeration process in the evaporation ponds. The chemical reaction of H_2S and oxygen to produce sulfate as an end product is dependent upon the level of both dissolved oxygen and the pH. Daily tests will be conducted and records made for each pond. If the pH falls below 8.0, remedial steps will be taken immediately to raise the pH. BDI at this time utilizes sodium hydroxide (caustic agent) to raise the pH to the optimal level of 8.2-9.0. Dissolved oxygen levels will be tested on a daily basis to ensure a residual of 0.5 ppm is maintained. The dissolved oxygen level will be taken at the beginning of each day, or at least once per 24-hour period, one foot off the bottom of each pond at various locations and recorded. If any tests show a dissolved residual oxygen level of less than 0.5 ppm, immediate steps will be under taken to oxygenate the pond and create a residual oxygen pond level to at least 0.5 ppm. Remedial measures may include addition of chemicals or increased aeration. The pH readings are logged are recorded daily on the BDI Daily Air and Water Inspection Form (**Attachment II.3.C**).

4.0 IMPLEMENTATION, ASSESSMENT, AND NOTIFICATION

The following subsections present a series of procedures for implementation, assessment, and notification of appropriate authorities in the event that a H_2S emergency develops [19.15.11.9 NMAC].

4.1 Implementation

The Contingency Plan will be implemented when an imminent or actual emergency situation develops that represents a potential impact to fresh water, public health, safety or the environment. The circumstances that could require implementation of this Plan includes the release of H_2S gas.

Table II.3.6 lists the implementation, assessment, and notification procedures that will be followed in the event of an emergency. Assessment and notification are discussed further in subsections 4.2 and 4.3.

TABLE II.3.6
Implementation, Assessment, and Notification Procedures for H_2S

1. **EVACUATE AREA AND NOTIFY THE ECs:** The employee who first becomes aware of the H_2S alarm will immediately evacuate the area, don protective personal breathing equipment and notify the Primary EC, and the Alternate EC and On-site EC if necessary. Notification will be made in person, via telephone, or via radio. The responding EC will assume full authority over the situation. Properly protected responders will then assist any affected personnel or customers.
2. **REMAIN UPWIND OF RELEASE:** Persons evacuated from the release area should remain away and upwind from the area of the release until a determination of the conditions has been made.
3. **ASSESS THE AMOUNT OF RELEASE:** The EC will assess the source, severity, and extent of the alarm. Monitoring equipment will be operated by trained personnel.
4. **MONITOR DOWNWIND IF H_2S = 10 PPM**: In the event a reading of 10 ppm is registered, the area will be evacuated and BDI personnel will monitor the H_2S levels along the downwind boundary of the facility.
5. **EVACUATE AND CLOSE THE FACILITY IF $H_2S \geq$20 PPM AT DOWNWIND BOUNDARY:** If levels reach 20 ppm at the downwind boundary, the facility will be evacuated and closed. Evacuation procedures are enumerated in **Table II.3.7** and a Site Evacuation Plan is provided as **Figure II.3.4**. Additionally, BDI will notify all persons residing within one-half mile of the fence line.
6. **NOTIFICATION OF AUTHORITIES:** Notification will be provided to the New Mexico State Police, Bloomfield Police, San Juan County Sheriff, San Juan County Fire Marshall, and OCD (**Table II.3.1**). In addition, medical authorities will be contacted if needed. BDI will also notify EnviroTech (if necessary) in Farmington (**Table II.3.1**) to provide response personnel, equipment, and supplies to mitigate the source of an H_2S reading of 10 ppm or greater.
7. **RECORDKEEPING:** BDI will log and report to the OCD all incidences where a reading of 10 ppm H_2S or greater is registered at the facilities boundary (also see Section 6.0).

4.2 Assessment

In the event of a release, the EC will immediately identify the character, source, amount and extent of released materials as feasible as well as assessing the potential impact to fresh water, public health, safety or the environment. During an emergency, the EC may amend this Plan as necessary to protect fresh water, public health, safety or the environment [19.15.11.9.F NMAC]. The EC will also assess the circumstances of an emergency situation and determine the responses required to:

- provide notifications to appropriate agencies and the general public
- implement appropriate response and recordkeeping procedures

The assessment provides the EC with critical data needed to determine whether an evacuation is necessary, whether emergency authorities should be contacted, and whether BDI should attempt to control the release with on-site personnel and equipment. **Table II.3.7** provides OCD descriptions of "major" and "minor" releases which are applicable to assessment purposes. This section contains additional detailed information regarding the Site Evacuation Plan, and Section 5.0 addresses control procedures.

4.2.1 Site Evacuation Plan

Based upon the type of waste materials and treatment received at BDI, the likelihood of a facility evacuation is unlikely [19.15.11.9.B.(2)(a) NMAC]. However, various circumstances could arise warranting a facility evacuation. In an emergency situation, the EC is the individual responsible for determining when evacuation of the facility is required. Imminent or actual dangers that constitute a situation that could require evacuation include:

- Detection of H_2S levels at 10 ppm or greater (evacuate the area and monitor downwind levels)
- Detection of H_2S levels at 20 ppm or greater (evacuate and close the facility)

When conditions warrant immediate evacuation (e.g., $H_2S \geq 20$ ppm), on-site persons (e.g., facility personnel, transporters, visitors, vendors, etc.) will be directed to proceed immediately to the Site Office, BDI's primary evacuation route. BDI Personnel will exercise good judgment and common sense in using the primary evacuation route to exit the facility, or selecting the most appropriate alternative evacuation route if necessary. Assembly points, and primary/alternative evacuation routes are provided on **Figure II.3.4.** Driving directions to the nearest hospital are included as **Figure II.3.5**. **Table II.3.8** provides detailed procedures for evacuating the facility

TABLE II.3.7
Part 29: Release Notification

19.15.29.7 DEFINITIONS:

A. "Major release" means:

(1) an unauthorized release of a volume, excluding gases, in excess of 25 barrels;

(2) an unauthorized release of a volume that:

- **(a)** results in a fire;
- **(b)** will reach a watercourse;
- **(c)** may with reasonable probability endanger public health; or
- **(d)** results in substantial damage to property or the environment;

(3) an unauthorized release of gases in excess of 500 MCF; or

(4) a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC.

B. "Minor release" means an unauthorized release of a volume, greater than five barrels but not more than 25 barrels; or greater than 50 MCF but less than 500 MCF of gases.

19.15.29.8 RELEASE NOTIFICATION:

A. The person operating or controlling either the release or the location of the release shall notify the division of unauthorized release occurring during the drilling, producing, storing, disposing, injecting, transporting, servicing or processing of oil, gases, produced water, condensate or oil field waste including regulated NORM, or other oil field related chemicals, contaminants or mixture of the chemicals or contaminants, in accordance with the requirements of 19.15.29 NMAC.

B. The person operating or controlling either the release or the location of the release shall notify the division in accordance with 19.15.29 NMAC with respect to a release from a facility of oil or other water contaminant, in such quantity as may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC.

19.15.29.9 REPORTING REQUIREMENTS: The person operating or controlling either the release or the location of the release shall provide notification of releases in 19.15.29.8 NMAC as follows.

A. The person shall report a major release by giving both immediate verbal notice and timely written notice pursuant to Subsections A and B of 19.15.29.10 NMAC.

B. The person shall report a minor release by giving timely written notice pursuant to Subsection B of 19.15.29.10 NMAC.

19.15.29.10 CONTENTS OF NOTIFICATION:

A. The person operating or controlling either the release or the location of the release shall provide immediate verbal notification within 24 hours of discovery to the division district office for the area within which the release takes place. In addition, the person shall provide immediate verbal notification of a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC to the division's environmental bureau chief. The notification shall provide the information required on form C-141.

B. The person operating or controlling either the release or the location of the release shall provide timely written notification within 15 days to the division district office for the area within which the release occurs by completing and filing form C-141. In addition, the person shall provide timely written notification of a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC to the division's environmental bureau chief within 15 days after the release is discovered. The written notification shall verify the prior verbal notification and provide appropriate additions or corrections to the information contained in the prior verbal notification.

19.15.29.11 CORRECTIVE ACTION: The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.

Based on:
2008 GOOGLE EARTH IMAGE
AZTEC, NM (2005 USGS DOQQ'S)

LEGEND

- SITE BOUNDARY
- EVACUATION ROUTE
- PRIMARY MEETING POINT
- SECONDARY MEETING POINT

NORTH

0' 150' 300'

SITE EVACUATION PLAN

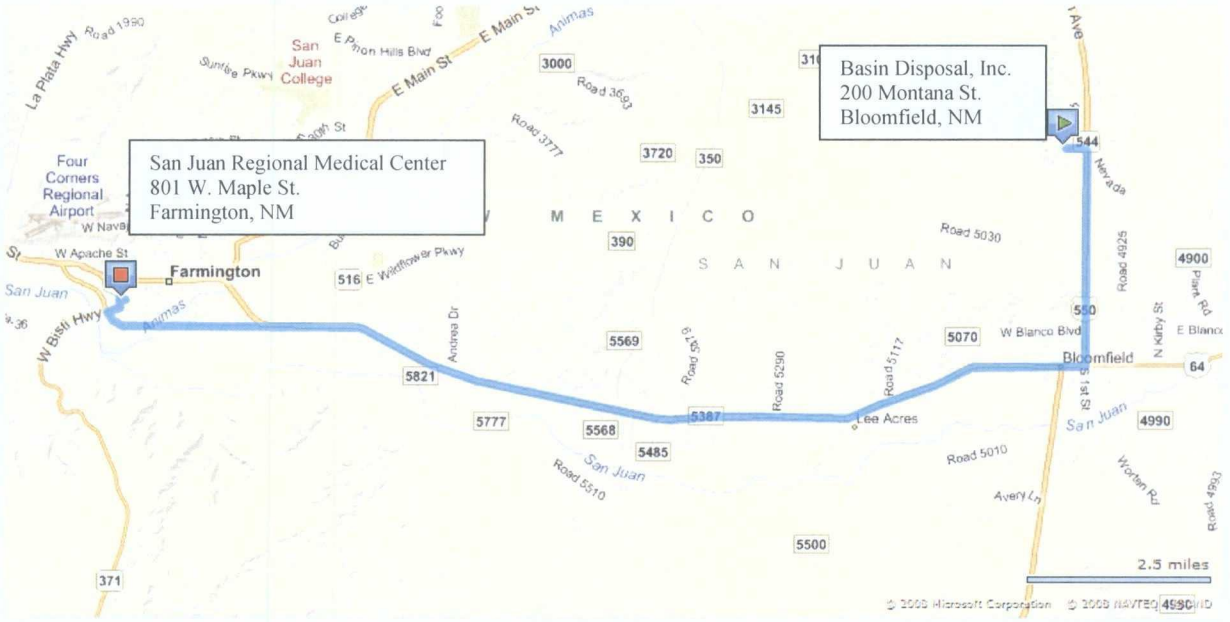
SURFACE WASTE MANAGEMENT FACILITY
BASIN DISPOSAL, INC.
SAN JUAN COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 10/27/08	CAD: EVAC AERIAL.dwg	PROJECT #: 520.01.01
DRAWN BY: MLH	REVIEWED BY: IKG	FIGURE II.3.4
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\520.01.01\02\FIGURES\EVAC AERIAL.dwg
Date/Time:Oct. 27, 2008-09:48:43

Figure II.3.5
Hospital Location



Driving Directions

FROM:
Basin Disposal, Inc.
200 Montana Street
Bloomfield, NM 87413
(505) 632-8936

TO:
San Juan Regional Medical Center
801 W. Maple Street
Farmington, NM 87401
(505) 325-5011

STEP	DIRECTIONS	DISTANCE	TOTAL DISTANCE
1	Starting at 200 Montana Street, bear right onto Nevada	0.3	0.3
2	Turn right onto US-550 South	3.0	3.3
3	Turn right to stay on US-64/US-550/W. Broadway Ave.	11.7	15.0
4	Keep straight onto E. Murray Dr.	1.2	16.2
5	Keep straight onto W. Murray Dr./US-64 West	1.0	17.2
6	Turn right onto SR-371 North/W. Pinon St.	0.2	17.4
7	Turn left to stay on SR-371/S. Lake St.	0.1	17.5
8	Turn right onto W. Maple St. and arrive at 801 W. Maple St.	0.1	17.6
		Estimated Travel Time = 29 minutes	

TABLE II.3.8
Evacuation Procedures

When evacuation is required, the following procedures will be followed:

1. Facility personnel will be alerted directly or using the facility telephone, cellular telephones, or radios.
2. Vehicles delivering waste will be diverted away from the location of the emergency and routed towards the facility exit (**Figure II.3.2**).
3. All facility operating equipment will be shut down.
4. Personnel will be directed to proceed to the Site Office, which will be the designated emergency response coordination location. The EC will identify missing persons at that time.
5. If the emergency involves the Site Office or its immediate environs, the intersection of NM 550 and Montana will be the secondary assembly point for facility personnel.
6. If the emergency precludes access to both, the Site Office and the intersection of NM 550 and Montana, personnel will evaluate the site via an auxiliary access gate at the west end of the facility.
7. Once assembled, personnel will stand by to afford assistance, if and as needed, or evacuate through Site Office.

4.3 Notification of Authorities and General Public

This Section provides a series of procedures for implementation and notification of appropriate authorities in the event that a specific emergency develops [19.15.11.16 NMAC]. Whenever there is an imminent or actual emergency, the EC will immediately contact on-site persons (facility personnel, visitors, vendors, transporters, etc.) of the emergency via on-site communication systems, as well as notify the appropriate state and local agencies as necessary. OCD will be notified within 4 hours after the Contingency Plan has been activated.

Table II.3.1 provides a list of emergency response agencies and contacts that may need to be notified depending on the type and extent of an emergency situation. **Table II.3.1** will be posted as appropriate and near on-site telephones for easy access by BDI personnel. Fire, police, and medical authorities will be contacted as necessary in an emergency situation (**Table II.3.1**).

In the case of an H_2S emergency where H_2S exceeds 10 ppm, notification will be provided to the New Mexico State Police, Bloomfield Police, San Juan County Sheriff, and OCD (also included on **Table II.3.1**):

- OCD
  Aztec, NM (505) 334-6170
  Mobile Phone (505) 320-0292
  Santa Fe, NM (505) 476-3440
- New Mexico State Police 911 or (505) 325-7847
- San Juan County Sherriff's Dept. 911 or (505) 334-6622
- Bloomfield Police Dept. 911 or (505) 634-1062

BDI will also notify EnviroTech (if necessary) in Farmington (**Table II.3.1**) to provide response personnel, equipment, and supplies to mitigate the source of an H_2S reading of H_2S $\geq$10 ppm.

Table II.3.7 provides specific information regarding notification of OCD in the case of a release, which by definition includes breaks, leaks, spills, releases, fires or blowouts. In addition, **Table II.3.7** also provides OCD definitions for "major" and "minor" releases.

Additional State, Federal, and other local emergency contact numbers are provided and should be used as deemed appropriate to the situation (**Table II.3.1**). If the EC determines that the incident could threaten fresh water, human health, public safety or the environment beyond the limits of the facility, the EC will notify the National Response Center and USEPA at the following phone numbers (also included on **Table II.3.1**):

- National Response Center - 24 Hr. Hotline: (800) 424-8802
- Region VI 24 hr. Emergency Response Hotline (USEPA): (214) 665-2222

The EC's notification to authorities will include the following information, as listed on the Incident Report Form (**Attachment II.3.D**):

- name and telephone number of person reporting the incident
- name and address of facility
- time and type of incident (e.g., hazardous material release, fire)
- name and quantity of material(s) involved, to the extent known
- extent of injuries, if any
- possible hazards to human health or the environment

5.0 EMERGENCY EQUIPMENT

The following sections describe emergency equipment at BDI that is available for responding to emergency situations. An Emergency Response Equipment List describing the equipment, quantity, location, and uses is provided as **Table II.3.9**.

5.1 Internal Communications

Communications at BDI are accomplished via cellular telephones, land lines, and two-way radios. These systems provide facility personnel with immediate emergency notification capabilities, and the opportunity to receive instructions in the event of an emergency incident. Any mechanical difficulties with the communications equipment will be promptly repaired. Internal communication devices are also listed on **Table II.3.9.**

5.2 External Communications

The land-line telephones and cell phones located at BDI have outside access in the event that notification of the local emergency response authorities is required (i.e., fire department, ambulance, etc.). Key facility personnel including the ECs, facility General Manager, etc., carry cellular telephones for contacting outside agencies. The cellular telephones also provide a backup means for contacting emergency authorities in the event they cannot be reached by conventional telephone lines. External communication devices are also included on **Table II.3.9.**

5.3 Personnel Protection, First Aid, and Safety Equipment

Personal protective equipment necessary for responding to a potential release of hazardous materials will be maintained in on-site buildings (Site Office, Maintenance Shop, and the Oil Recycling Plant) and/or issued to each employee (**Table II.3.9**). These items include Tyvek suits, gloves, safety glasses, hearing protection, SCBA, etc.

First aid and safety equipment will be maintained at strategic locations at BDI as shown on **Table II.3.9**. Safety equipment located at the facility includes industrial first aid kits, fire extinguishers, an eye wash station, etc. First aid kits are placed in the facility office, maintenance shop and oil recycling plant. In addition, first aid kits will be maintained in all facility vehicles, including heavy equipment. Prominent signs will be placed identifying the location of health and safety equipment, and emergency response items (e.g., fire extinguishers).

TABLE II.3.9
Emergency Response Equipment List

Equipment Description	Quantity	Location	Use(s)
10 lb ABC rated fire extinguisher	2	Site Office	Firefighting
10 lb ABC rated fire extinguisher	2	Trucks	Firefighting
10 lb ABC rated fire extinguisher	1	Heavy Equipment	Firefighting
20 lb ABC rated fire extinguisher	1	Oil Treating Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Concrete Slab	Firefighting
20 lb ABC rated fire extinguisher	1	Oil Sales Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Oil Separation Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Water Receiving Tanks 1-4	Firefighting
20 lb ABC rated fire extinguisher	1	Water receiving Tanks, Amigo	Firefighting
20 lb ABC rated fire extinguisher	1	Pump House	Firefighting
20 lb ABC rated fire extinguisher	1	Diesel Storage Tank	Firefighting
20 lb ABC rated fire extinguisher	1	Conoco SJGP Inlet Line	Firefighting
Loader	1	Facility	Berm Repair
Bobcat	1	Facility	Berm Repair
Oil Booms	4	NE Corner of Pond	Oil Containment
SCBA	1 per employee	Site Office	Protective gear for employees
Pair leather gloves	1 per employee	Assigned to employee	Protective gear for employees
NOMEX Coveralls	7 per Employee	Assigned to Employee	Protective gear for employees
Pair safety glasses	1 per employee	All employee workstations	Protective gear for employees
Round-point wood handle shovels	2	Shop	Contain spillage, putting out fires
Round-point wood handle shovels	2	20 um Filter House	Contain spillage, putting out fires
First Aid Kit	1	Site Office	First Aid
First Aid Kit	1 per vehicle	Facility Vehicles	First Aid
Eye Wash Station	1	SE Corner of Water Receiving Tanks	First Aid
Portable 2-way radio	1 per employee	Base unit at Site Office	Communications
Cell Phones	4	General Manager Plant Manager Plant Supervisor Office Supervisor	Communications
Office Phone	1	Site Office	Communications
Mobile pressure washer	1	Mobile	Decontamination equipment

6.0 RECORDKEEPING

The EC will be responsible for ensuring that emergency response actions are fully documented. The Primary EC may complete the documentation requirements or delegate to another EC. The BDI Incident Report Form (**Attachment II.3.D**) illustrates the information that will be recorded as a result of any emergency incident and related response action. This form will be signed by both the EC and the facility Plant Manager. Copies of the form filed for each incident will be retained as part of the Facility Operating Record.

In addition, in the case of an unauthorized release at BDI, the OCD will be notified pursuant to 19.15.29 NMAC. As defined by OCD a "release" is any *"breaks, leaks, spills, releases, fires or blowouts involving crude oil, produced water, condensate, drilling fluids, completion fluids or other chemical or contaminant or mixture thereof, including oil field wastes and natural gases to the environment"* (19.15.2.7.R(4) NMAC). A major release (19.15.29 NMAC; **Table II.3.7**) includes an unauthorized release of any volume which may with reasonable probability endanger public health; or an unauthorized release of natural gases in excess of 500 mcf; or a release of any volume which may with reasonable probability endanger public health or results in substantial damage to property or to the environment, cause detriment to water or exceed the standards in 19.15.30 NMAC. A major release requires both immediate verbal notification (within 24 hours) as well as timely written notification to OCD (within 15 days) using form C-141 relating to release Notification and Corrective Action. A minor release (**Table II.3.7**) is an unauthorized release of greater than 50 mcf but less than 500 mcf of natural gases. A minor release requires timely written notice only. A copy of form C-141 is provided as **Attachment II.3.E**. Copies of the form filed for each incident will be retained as part of the Facility Operating Record.

7.0 COORDINATION AGREEMENTS

A copy of the Hydrogen Sulfide Prevention Plan is made available to the organizations identified in **Table II.3.1**. The Hydrogen Sulfide Prevention Plan serves to familiarize each of the identified organizations with the operations of the facility and types of emergencies and responses that may be required. Each agency will be encouraged to visit the Facility for purposes of assessing site operations and providing input regarding emergency response procedures [19.15.11.9.B.(2)(e) NMAC].

8.0 PLAN AMENDMENT

The EC will be responsible for assuring that updates to or amendments of the Contingency Plan are conducted and recorded in the event of any of the following [19.15.11.9.F NMAC]:

1. The Facility Permit is revised or modified.
2. Division mandate or regulatory updates
3. The Plan fails in an emergency.
4. Modification to the Facility design, construction, operation, maintenance or other circumstances that changes the potential for fires, explosion, or releases of hazardous oil field waste constituents; or related changes in the appropriate emergency response.
5. The list of ECs changes.
6. The list of emergency equipment changes significantly.

The revised Hydrogen Sulfide Prevention and Contingency Plan will be distributed to OCD and made available to each of the organizations identified in **Table II.3.1** with a cover letter highlighting any substantive changes. Proposed changes will be in compliance with 19.15.36 NMAC.

9.0 TRAINING

The EC or representative will ensure all new and existing employees are trained on the Hydrogen Sulfide Prevention and Contingency Plan at least annually or when significant changes to the Plan have been made, whichever is greater. Prior to any new employee commencing work, a training session separate from the standard annual training will be conducted to provide specific proficiency in H_2S safety and procedures. Training will include both classroom drills and field exercises simulating H_2S monitoring, releases, and evacuation procedures. Included in this training, H_2S hazards, detection, personal protection, and contingency procedures will be extensively covered.

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.A

MATERIAL SAFETY DATA SHEET FOR H_2S

ConocoPhillips

MATERIAL SAFETY DATA SHEET

Hydrogen Sulfide

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Hydrogen Sulfide
Synonyms:	H2S Sour Gas Sulfuretted Hydrogen Hepatic Gas Hydrosulfuric Acid Alliance - Hydrogen Sulfide - 1605 Ferndale - Hydrogen Sulfide - 1605 LAR - Acid Gas LAR - Sour Gas Santa Maria - Acid gas Santa Maria - Sour Gas Trainer - Hydrogen Sulfide - S173 Wood River - Hydrogen Sulfide - 100240
Intended Use:	Refinery by-product
Chemical Family:	Inorganic Gas

Responsible Party:
ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

MSDS Information:
800-762-0942
MSDS@conocophillips.com

Emergency Overview

24 Hour Emergency Telephone Numbers:
Spill, Leak, Fire or Accident Call CHEMTREC:
North America: (800) 424-9300
Others: (703) 527-3887 (collect)

California Poison Control System: (800) 356-3219

Health Hazards/Precautionary Measures: Poisonous hydrogen sulfide gas. Harmful if inhaled. Causes severe eye irritation. Use with ventilation adequate to keep exposure below recommended limits, if any. Do not breathe gas. Avoid contact with eyes. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Flammable gas. Can cause flash fire. Keep away from heat, sparks, flames, static electricity or other sources of ignition. Do not enter storage areas or confined space unless adequately ventilated.

Appearance:	Colorless
Physical Form:	Gas
Odor:	Rotten egg (odorless at high concentrations or after prolonged exposure at low concentrations)

NFPA 704 Hazard Class:

Health:	4 (Extreme)
Flammability:	4 (Extreme)
Instability:	0 (Least)

2. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS					
Component / CAS No:	**Percent (%)**	**ACGIH:**	**OSHA:**	**NIOSH:**	**Other:**
Hydrogen Sulfide 7783-06-4	100	10 ppm TWA 14 mg/m^3 TWA 15 ppm STEL 21 mg/m^3 STEL	20 ppm CEIL 50 ppm 10 min. peak	100 ppm IDLH	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

1%=10,000 PPM.
NE=Not Established

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye: Severe eye irritant. Contact may cause stinging, watering, redness, swelling, and eye damage.

Skin: Skin contact is unlikely. No information available on skin absorption.

Inhalation (Breathing): Toxic. May be harmful if inhaled.

Ingestion (Swallowing): This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Signs and Symptoms: Effects of overexposure may include irritation of the eyes, nose, throat, and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats (arrhythmias), sudden collapse, respiratory failure, convulsions and death.

Cancer: There is no information available on the cancer hazard of this material.

Target Organs: No data available for this material.

Developmental: Inadequate data available for this material.

Other Comments: Hydrogen sulfide is a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include respiratory (asthma-like) disorders.

4. FIRST AID MEASURES

Eye: Immediately move victim away from exposure and into fresh air. If irritation or redness develops, flush eyes with clean water and seek immediate medical attention. For direct contact, immediately hold eyelids apart and flush the affected eye(s) with clean water for at least 20 minutes. Seek immediate medical attention.

Skin: First aid is not normally required. However, it is good practice to wash any chemical from the skin.

Inhalation (Breathing): Immediately move victim away from exposure and into fresh air. If respiratory symptoms or other symptoms of exposure develop, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Notes to Physician: In high doses hydrogen sulfide may produce pulmonary edema and respiratory depression or paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote; however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of H2S is confirmed and the patient does not respond rapidly to supportive care, the use of nitrites is an alternative treatment. For adults the dose is 10 ml of a 3% NaNO2 solution (0.5 gm NaNO2 in 15 mL water) I.V. over 2-4 minutes. Dosage should be adjusted in children or in presence of anemia. Follow blood pressure, methemoglobin levels, arterial blood gases, and electrolytes closely in serious cases.

5. FIRE-FIGHTING MEASURES

Flammable Properties:

Flash Point:	10°F / -12°C
Test Method:	Test Method Unknown
OSHA Flammability Class:	Flammable Gas
LEL%:	4.0
UEL%:	46.0
Autoignition Temperature:	500°F / 260°C

Unusual Fire & Explosion Hazards: This material is flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. Vapors are heavier than air and can accumulate in low areas. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. If container is not properly cooled, it can rupture in the heat of a fire. Closed containers exposed to extreme heat can rupture due to pressure buildup.

Extinguishing Media: Dry chemical or carbon dioxide is recommended. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. If this cannot be done, allow fire to burn. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Stay away from ends of container.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk.

6. ACCIDENTAL RELEASE MEASURES

Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical equipment is recommended.

Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate danger area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).

Water spray may be useful in minimizing or dispersing vapors (see Section 5).

Notify fire authorities and appropriate federal, state, and local agencies. If spill/release in excess of EPA reportable quantity (see Section 15) is made into the environment, immediately notify the National Response Center (phone number 800-424-8802).

7. HANDLING AND STORAGE

Handling: The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-704 and/or API RP 2003 for specific bonding/grounding requirements.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8).

Use good personal hygiene practices.

Storage: Keep container(s) tightly closed. In a tank, barge, or other closed container, the vapor space above materials that contain hydrogen sulfide (H2S) may result in concentrations immediately dangerous to life or health (IDLH). Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Post area "No Smoking or Open Flame." Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional engineering controls may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Personal Protective Equipment (PPE):

Respiratory: Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode in oxygen deficient environments (oxygen content <19.5%) or if exposure concentration is unknown or if conditions immediately dangerous to life or health (IDLH) exist.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

Skin: Not required based on the hazards of the material. However, it is considered good practice to wear gloves when handling chemicals.

Eye/Face: The use of a face shield and chemical goggles to safeguard against potential eye contact, irritation, or injury is recommended.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Colorless
Physical Form:	Gas
Odor:	Rotten egg (odorless at high concentrations or after prolonged exposure at low concentrations)
Odor Threshold:	0.0047 ppm
pH:	Not applicable
Vapor Pressure (mm Hg):	554.6 psia @ 100°F (38°C)
Vapor Density (air=1):	1.20
Boiling Point:	-60°F / -12°C
Melting/Freezing Point:	-86°F / -66°C
Solubility in Water:	Slight
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	1.2 (Gas)
Heat Value (BTU):	-6552 (BTU/lb)

Percent Volatile:	100%
Evaporation Rate (nBuAc=1):	>1
Molecular Weight:	34.08
Flash Point:	10°F / -12°C
Test Method:	Test Method Unknown
LEL%:	4.0
UEL%:	46.0
Autoignition Temperature:	500°F / 260°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Flammable gas.

Conditions to Avoid: Avoid high temperatures and all sources of ignition (see Sections 5 and 7). Toxic fumes can be released on heating.

Materials to Avoid (Incompatible Materials): Avoid contact with nitric acid, strong oxidizing agents.

Hazardous Decomposition Products: Combustion can yield sulfur oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

No definitive information available on carcinogenicity, mutagenicity, target organ, or developmental toxicity.

Acute Data:

Hydrogen Sulfide - CAS: 7783-06-4
Dermal LD50 = Not Applicable
LC50 = 600 ppm, 30 min. (Human)
Oral LD50 = Not Applicable

12. ECOLOGICAL INFORMATION

Not evaluated at this time.

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced or spilled to soil or water, would be a RCRA "listed" hazardous waste, as would any soils or waters contaminated by spills of the material. This material is listed as hydrogen sulfide (U135). Further, this material, once it becomes a waste, is subject to the land disposal restrictions at 40 CFR 268.40 and must be treated prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent than the federal requirements.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORTATION INFORMATION

DOT

Note: This material normally remains in plant and does not enter the public transportation system. i.e. rail, highway, air or water.

IMDG

ICAO/IATA

	LTD. QTY.	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

15. REGULATORY INFORMATION

U.S. Regulations:

EPA SARA 311/312 (Title III Hazard Categories)

Acute Health:	Yes
Chronic Health:	No
Fire Hazard:	Yes
Pressure Hazard:	No
Reactive Hazard:	No

SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:
Hydrogen Sulfide.....7783-06-4.....100%

EPA (CERCLA) Reportable Quantity (in pounds):
Petroleum Exemption applies to this material.

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:
Hydrogen Sulfide.....7783-06-4.....500

California Proposition 65:
Warning: This material contains the following chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm, and are subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):
-- None Known --

Carcinogen Identification:
This material has not been identified as a carcinogen by NTP, IARC, or OSHA.

TSCA:
All components are listed on the TSCA inventory.

International Regulations:

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Domestic Substances List: Listed
WHMIS Hazard Class:
B1 - Flammable Gases
D1A - Materials Causing Immediate and Serious Toxic Effects - Very Toxic Material
D2B - Materials Causing Other Toxic Effects - Toxic Material

16. OTHER INFORMATION

Issue Date:	13-Oct-2005
Previous Issue Date:	28-Dec-2000
Revised Sections or Basis for Revision:	Responsible party (Section 1) Added facility synonyms - SEE SECTION 1.
MSDS Code:	001909

Disclaimer of Expressed and implied Warranties:
The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.B

BASIN DISPOSAL, INC. INSPECTION REPORT FORM

BASIN DISPOSAL, INC.

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD
P.O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE (505) 632-8936

NO.
NMOCD PERMIT: NM -001-0005
Oil Field Waste Document, Form C138
INVOICE:

DATE _____ DEL. TKT#. _____

GENERATOR: _____ BILL TO: _____

HAULING CO. _____ DRIVER: _____
(Print Full Name)

ORDERED BY: _____ CODES: _____

WASTE DESCRIPTION: ☒ Exempt Oilfield Waste ☐ Produced Water ☐ Drilling/Completion Fluids ☐ Reserve Pit

STATE: ☐ NM ☐ CO ☐ AZ ☐ UT TREATMENT/DISPOSAL METHODS: ☒ EVAPORATION ☒ INJECTION ☒ TREATING PLANT

NO.	TRUCK	LOCATION(S)	VOLUME	AM	PM	COST	TOTAL	TIME
1								
2								
3								
4								
5								
					TOTAL			

I, _____ representitive or authorized agent for the above generator and hauler hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination that the above described waste is RCRA Exempt, Oil field wastes generated from oil and gas exploration and production operations and not mixed with non-exempt waste, per OCD's mixing policy.

☐ Approved ☐ Denied ATTENDANT SIGNATURE: _____

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.C

BASIN DISPOSAL, INC. DAILY AIR AND WATER INSPECTION REPORT FORM

H_2S MONITOR

BASIN DISPOSAL, INC.
DAILY AIR AND WATER INSPECTION

YEAR 2008 MONTH _____ WEEK BEGINNING _____

AMBIENT AIR WIND SPEED/DIRECTION
A.AM READINGS, NOTE INTIALS AND TIME
B.PM READINGS, NOTE INTIALS AND TIME
SUMP LEVELS
A. POND AND SLAB CHECKED DAILY,NOTE INTIALS AND TIME
B. PUMP SUMP CHECKED AM & PM,NOTE INTIALS AND TIME
C. LOADING AREA SUMP CHECKED AM & PM, NOTE INTIALS AND TIME

LOADING SUMP EMPTIED
A. LOADING AREA SUMP EMPTIED AT 4 PM, NOTE INTIALS AND TIME
CONCRETE SLAB EMPTIED
A.SLAB EMPTIED AT 4 PM, NOTE INTIALS AND TIME

Date	Sun	Mon	Tues	Wed	Thu	Fri	Sat
Ambient Air H2S (AM)							
H2S Reading (ppm)							
Wind Speed (mph)							
Wind Direction							
Initials and Time							
Ambient Air H2S (PM)							
H2S Reading (ppm)							
Wind Speed (mph)							
Wind Direction							
Initials and Time							
Sump Levels							
AM Pond Sump (ft)							
AM Cement Slab (ft)							
AM Loading Area (ft)							
AM Pump House Sump (ft)							
Intials and Time							
PM Loading Area (ft)							
PM Pump House(ft)							
Intials and Time							
Loading Sump Emptied							
Intials and Time							
Concrete Slab Emptied							
Intials and Time							
Pond Conditions							
Pond Level							
Overflow Color							
Pond Color							
Water Temperature							
pH							
Dissolved Oxygen							
Total Chlorine							
Dissolved H2S/Sulfides							
Bleach/Chemical							
Volume							
Time							
Initials							
Volume							
Time							
Initials							
Volume							
Time							
Initials							
Volume							
Time							
Initials							
Volume							
Time							
Initials							
Volume							
Time							
Initials							
Manager Verification							
Intials and Time							

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.D

BASIN DISPOSAL, INC. INCIDENT REPORT FORM

Fax completed report within 24 hours to Basin Disposal, Inc. at 505-333-3898

INCIDENT REPORT FORM

Type of Incident and General Information

- ❑ Work related Injury / Illness
- ❑ Property Damage
- ❑ Vehicular Accident
- ❑ Unsafe Act / Near Miss
- ❑ Vandalism / Criminal Activity
- ❑ Other _____

Employee Name: _____ Job Title: _____

Date of Incident: _____ Time of Incident: _____ AM/PM

Location of Incident: _____

Unit# _____ Start of Shift:_____Weather:_____

Date and Time Reported to Management : Date:_____ Time:_____ AM/PM

Reported to: _____ Title:_____ Reported by:_____

What was the injury category of incident at the time it was first reported to management ?

[ ] N/A. BDI employee does not claim an injury associated with this incident
[ ] Notice Only of Injury, Declined Medical Treatment at this time
[ ] First Aid done on site, Declined Medical Treatment at this time
[ ] Medical Treatment. Transported by _____ to _____
[ ] Fatality, BDI employee

Employee's Description of Incident / Declaración del empleado de los hechos

THIS SECTION FILLED OUT BY EMPLOYEE

Were you injured ? *(Ud. se lastimó ?)* **Yes [ ]** **No [ ]**

Type of Injury: *(Tipo de lesión)* _____

Part of Body:_____ Left_____ Right_____
(Parte del cuerpo) *(Izq)* *(Der)*

Explain in your own words what happened. *(Explique en sus propias palabras lo que sucedió)*

_____

_____

_____

_____

_____

_____

_____

Employee Signature: (*Firma del empleado*) :_____

Date: (*Fecha*) _____

TO BE FILLED OUT BY BASIN DISPOSAL, INC. ACCIDENT INVESTIGATOR

Describe in order of occurrence the events leading to the accident and/or injury. Reconstruct the sequence of events that led to the accident.

_____

_____

_____

_____

_____

_____

_____

_____

Witnesses / Bystanders / Co-workers **Yes [ ] N/A (No Witnesses) [ ]**

Name: _____ Address: _____
Phone: _____ Workplace: _____
Was a Written Statement Obtained ? Yes [ ] No [ ]

Name: _____ Address: _____
Phone: _____ Workplace: _____
Was a Written Statement Obtained ? Yes [ ] No [ ]

Drug and Alcohol Post Accident Test

Is the BDI employee a D.O.T. regulated employee ? Yes [ ] No [ ]
Did the BDI employee receive a moving traffic violation ? Yes [ ] No [ ]
Were any of the vehicles involved towed away ? Yes [ ] No [ ]
Was "immediate medical treatment" required for anyone ? Yes [ ] No [ ]
Was a post accident drug/alcohol test performed ? Yes [ ] No [ ]
If so, was the D/A test conducted within 2 hours ? Yes [ ] No [ ] N/A [ ]

Investigated by: _____ (Waste Connections Employee)

Title: _____ Date: _____ Department: _____

CORRECTIVE ACTIONS. (Equipment, Practices, Environment, Retraining) Steps that have been, or will be taken to prevent recurrence:

_____

_____

_____

_____

_____

Corrective Action Completed ? ☐ YES Date Completed: _____

- I have been briefed on the corrective actions outlined above
- *Estoy consciente de las acciones correctivas mencionadas anteriormente en esta hoja*

_____

Employee's Signature / Date

REPORT REVIEWED AND CONCLUDED BY:

_____

Immediate Supervisor's Signature / Date

_____

Employee's Manager's Signature / Date

DISCIPLINARY ACTION ? ☐ YES ☐ NO
(Timely forward appropriate paperwork to BDI)

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.E

OCD RELEASE NOTIFICATION AND CORRECTIVE ACTION FORM C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☐ Final Report

Name of Company	Contact
Address	Telephone No.
Facility Name	Facility Type

Surface Owner	Mineral Owner	Lease No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County

Latitude_____ **Longitude**_____

NATURE OF RELEASE

Type of Release	Volume of Release	Volume Recovered
Source of Release	Date and Hour of Occurrence	Date and Hour of Discovery
Was Immediate Notice Given? ☐ Yes ☐ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☐ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Describe Area Affected and Cleanup Action Taken.*

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION	
Printed Name:	Approved by District Supervisor:	
Title:	Approval Date:	Expiration Date:
E-mail Address:	Conditions of Approval:	Attached ☐
Date: Phone:		

Attach Additional Sheets If Necessary

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 4: CLOSURE/POST-CLOSURE PLAN

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ATTACHMENTS

SECTION 4: CLOSURE/POST-CLOSURE PLAN

1.0 PURPOSE

This Closure/Post-Closure (C/PC) Plan for the Basin Disposal, Inc. (BDI) facility has been prepared in accordance with requirements of 19.15.36.8.C(9) NMAC This Plan describes the updated procedures for closure and post-closure of BDI. This C/PC Plan fulfills the requirements of 19.15.36.18 NMAC.

The BDI land is owned and operated by:

Mr. Jerry Sandel
P.O. Box 100
Aztec, NM 87410

Mr. David Turner
P.O. Box 358
Farmington, NM 87499

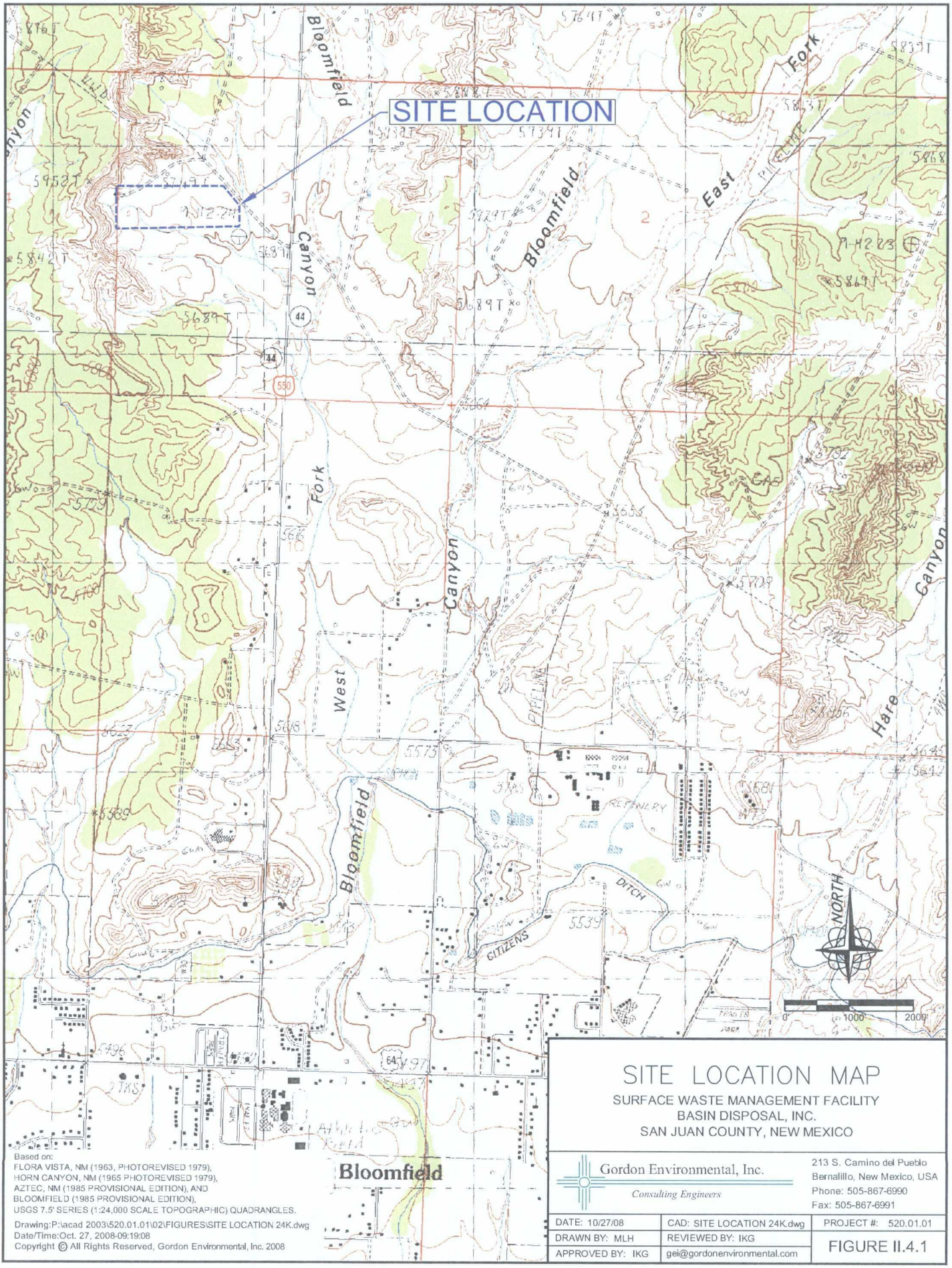
BDI is located in Bloomfield, New Mexico.

1.1 Plan Modifications

This C/PC Plan may be modified by BDI to address changes in site conditions and submitted and approved by OCD 30 days prior to the proposed change. This Plan may also be amended at the request of OCD [19.15.36.18.A.(5) NMAC].

2.0 SITE DESCRIPTION

BDI is located entirely within Section 3, Township 29 North, Range 11 west approximately 3 miles north of the intersection of Highway 550 and 64 (**Figure II.4.1**). The site lies about 4 miles north of the San Juan River, and about 6 miles south of the Animas River on Crouch Mesa, about 500 feet and 400 feet above the respective river plains. The site occupies the West Fork of Bloomfield Canyon, an ephemeral drainage the drains south to the San Juan River; the site slopes gently to the east and south east, from a maximum elevation of 5,750 feet to less than 5,700 feet. The closest residence is over 1046 feet directly south of the BDI site. A hydrogeologic investigation indicated that non-protected groundwater (TDS > 10,000 mg/L) is present beneath the site at a depth of 30 feet to 42 feet; and that fresh water is at least 100 feet below ground level.



SITE LOCATION MAP

SURFACE WASTE MANAGEMENT FACILITY
BASIN DISPOSAL, INC.
SAN JUAN COUNTY, NEW MEXICO

Based on:
FLORA VISTA, NM (1963, PHOTOREVISED 1979),
HORN CANYON, NM (1965 PHOTOREVISED 1979),
AZTEC, NM (1985 PROVISIONAL EDITION), AND
BLOOMFIELD (1985 PROVISIONAL EDITION),
USGS 7.5' SERIES (1:24,000 SCALE TOPOGRAPHIC) QUADRANGLES.

Drawing:P:\acad 2003\520.01.01\02\FIGURES\SITE LOCATION 24K.dwg
Date/Time:Oct. 27, 2008-09:19:08

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 10/27/08	CAD: SITE LOCATION 24K.dwg	PROJECT #: 520.01.01
DRAWN BY: MLH	REVIEWED BY: IKG	FIGURE II.4.1
APPROVED BY: IKG	gei@gordonenvironmental.com	

3.0 CLOSURE PLAN

3.1 Construction Schedule

BDI will notify the Division's Environmental Bureau at least 60 days prior to cessation of permanent operations at the facility. Included in this notification will be a proposed schedule for sampling and closure activities. During the 60 day period after notification, it is anticipated BDI will coordinate the required site inspection by the Division. Additionally, during this period, BDI and the Division will review and modify any part of this C/PC plan and proposed schedule that may be required for the protection of fresh water, public health, safety or the environment that may result from the inspection. Should the Division not notify BDI of any modification or additions to the C/PC Plan, BDI will commence the following closure activities at the facility provided the Director has not extended, in good cause, the Division's response to the closure notification.

3.2 Liquids Removal

Liquids remaining in the evaporation ponds at time of closure will be disposed of in the on-site injection well. The injection well will remain in operation until all liquids are removed from the site. Although highly unlikely, should the injection well not be operational at time of closure, all remaining liquids will be removed from the ponds and disposed of in a Division-approved surface waste management facility.

3.3 Liner Removal

Upon successful liquids removal, the remaining sludge, if any, will be allowed to dry to a consistency that lends itself to handling and removal. Testing of the sludge will be performed prior to removal and disposal at a Division-approved surface waste disposal facility in conformance with current operating standards. Testing of the sludge will be for:

- TPH
- BTEX
- RCRA metals
- Paint Filter
- Chlorides
- Any other parameters required by the disposal facility or rule at time of closure

The sample results will be to the Environmental Bureau in the Division's Santa Fe office. Once the sludge has been removed, the HDPE liner systems components will be thoroughly

cleaned in accordance with 19.15.35.8 NMAC. BDI proposes to cut the HDPE liner material and geocomposite into manageable pieces and transport the material to a New Mexico Environment Department approved recycling or disposal facility.

3.4 Tank Removal

Upon closure all tanks and equipment will be emptied and cleaned. BDI will test accordingly and dispose of the residual oil field waste removed from the tanks at a Division-approved surface waste management facility. BDI will reuse, recycle or remove the tanks, infrastructure, and equipment from the site within 90 days of closure.

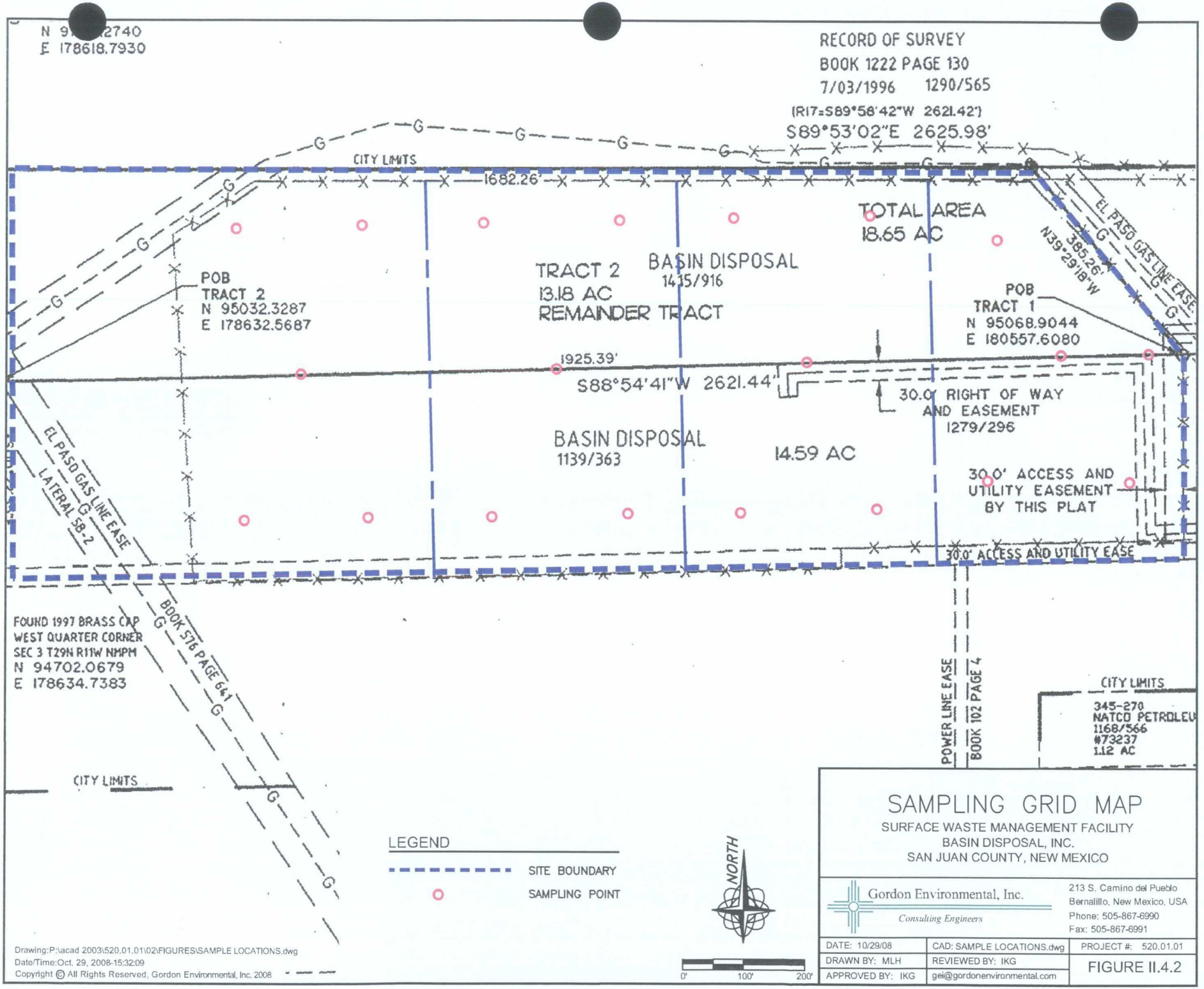
3.5 Injection Well

Once all liquids from the site has been injected or properly disposed of, the injection well will be plugged in accordance with the Plugging and Permanent Abandonment rule 19.15.25.10 NMAC within 90 days of closure. The Division will be sent Form C-103 notification as required. The Closure/Post Closure Cost Estimate (**Attachment II.4.A**) and Financial Assurance Documentation (**Attachment II.4.B**) addresses the bond issued to the OCD for plugging of the on-site injection well.

3.6 Site Sampling

Once all tanks, equipment, liners and plugging of the injection well has been completed, but prior to backfilling ponds and site leveling, the site will be sampled in accordance with chapter nine of EPA publication SW-846; Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. **Figure II.4.2**, Sampling Grid, illustrates the proposed sampling grid at the BDI site after closure. Soil samples will be taken at selected locations in the areas used for shipping and receiving, treatment and storage areas, and the evaporation ponds area. The soil samples will be taken at selected depths within the in situ soil, including at least one from the first foot of soil and one within 36 to 42 inches below the surface. Samples will be evaluated for the following constituents:

- TPH
- BTEX
- Metals and organics listed in WQCC 20.6.2.3103.A&B



SAMPLING GRID MAP

SURFACE WASTE MANAGEMENT FACILITY
BASIN DISPOSAL, INC.
SAN JUAN COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 10/29/08	CAD: SAMPLE LOCATIONS.dwg	PROJECT #: 520.01.01
DRAWN BY: MLH	REVIEWED BY: IKG	FIGURE II.4.2
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\520.01.01\02\FIGURES\SAMPLE LOCATIONS.dwg
Date/Time:Oct. 29, 2008-15:32:09

Samples will be submitted to the Environmental Bureau in the Division's Santa Fe office. Provided the sample results indicate no contamination exists at the facility in excess of allowable levels, BDI will proceed with final site closure and post-closure activities.

3.7 Final Site Closure

Upon Division determination that no contamination exists at BDI, the facility will be regraded to the intended final use. Activities to be conducted during this period include:

- Submittal of Notice of Intent (NOI) to the EPA for a Construction General Permit (CGP) and SWPPP implementation
- Evaporation and sedimentation pond berms removal and backfilling
- Site grading and re-contouring
- Site revegetation

Vegetation on the site will be planted during the optimum planting period, whenever possible. Examples of seed types identified and recommended by the Natural Resource Conservation Service (NRCS) as acceptable cover for the local climate and precipitation include, but are not limited to:

Bouteloua gracilis (Blue Grama)	1.5 pounds per acre
Bouteloua cortipendula (Sideoats grama)	4.5 pounds per acre
Sand Dropseed	1 pound per acre
Little Bluestem	3.4 pounds per acre
Western Wheatgrass	8 pounds per acre
Short-Stemmed Straw Mulch	1650 pounds per acre

The Closure Documentation Record (**Attachment II.4.C**), or a similar template, will be used to record the field activities specific to final site closure. When construction activities are complete, a licensed New Mexico professional engineer will certify facility closure.

3.8 Final Land Use

At this time BDI has not established use for the facility after closure. Should use be determined, BDI will notify the Division and request approval to be released from the following post closure activities provided there has not been a release to the vadose zone or ground water pursuant to 19.15.30 and 19.15.29.

4.0 POST-CLOSURE PLAN

4.1 Post-Closure Maintenance

BDI will monitor and provide post-closure maintenance for the facility for a period of not less than 3 years, or as otherwise approved by the Division. During the post-closure care period, BDI proposes to inspect and maintain the site at least quarterly, and immediately after a documented 24 hour, 25-year storm event, whichever is more frequent on the Site Inspection Checklist (**Attachment II.4.D**). Upon successful re-vegetative efforts resulting in at least 70% coverage or other approved erosion control methods (gravel mulches, ect.), BDI plans to reduce the inspection frequency to semiannual. Post-closure care inspections will typically include:

- Vegetative growth observation
- Erosion
- Differential settlement
- Monitoring well integrity(if conducted due to vadose zone or groundwater releases)

Should deficiencies or discrepancies be discovered during the site inspections in these or any other areas of the landfill, BDI will conduct corrective measures.

4.2 Reporting

Reports of post-closure activities including, but not limited to, monitoring results, site inspection data, and maintenance procedures will be submitted to the Division within 45 days from the end of each calendar year or as otherwise required.

5.0 FINANCIAL ASSURANCE

5.1 Closure/Post Closure Cost Estimate

The Cost Estimate (**Attachment II.4.A**) for the closure and post-closure activities described in this C/PC Plan is presented in current dollars and assumes third party contractors to perform closure and post closure activities at the site as required by the Rules. Preparation of the estimate it is also assumes no contamination or remedial activities due to releases into the environment. The estimate will be revised accordingly, as required, should any unforeseen conditions arise. Upon Division approval of the requested permit, BDI will submit a revised financial assurance mechanism in the form of a Letter of Credit or other approved mechanism pursuant to 19.15.36 to the Division based on the estimates provided in this Plan. For informational purposes, the existing C/PC Cost Estimate and Financial Assurance Mechanism is provided in **Attachments II.4.A** and **II.4.B**.

5.2 Release of Financial Assurance

Upon successful completion of closure activities and after Division concurrence, BDI will request the release of the financial assurance mechanism in-place for closure the facility. After the 3-year post-closure period has expired, and provided there is not any contamination and the site has established re-vegetation in accordance with the regulations, BDI will request release from the remaining financial assurance requirements for the facility.

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 4: CLOSURE/POST-CLOSURE PLAN

ATTACHMENT II.4.A

CLOSURE/POST-CLOSURE COST ESTIMATES

Attachment II.4.A
Basin Disposal, Inc.
Oil Waste Evaporation Basins

Table 1
C/PC Cost Estimates Summary
(September 2008)

Activity	C/PC
1. Site Closure Cost Summary (30 acres maximum open area)	$ 267,299
2. Post-closure Care and Monitoring	$ 19,800
Total:	**$ 287,099**

Table 2
Closure Cost Estimate
(September 2008)

Task Description	Units	Unit Cost	Total (28 acres)	
			Quantity	Cost
1.0 Evaporation Pond				
1.1 Liquids Transport/Disposal				
1.1.1 Transport Liquid	bbl	$1.75	70	$ 123
1.1.2 Disposal Liquids	bbl	$0.95	70	$ 67
1.1.3 Remove/Transport Sludge	ton	$6.50	4,840	$ 31,460
1.1.4 Disposal Sludge	ton	$15.00	4,840	$ 72,600
1.1.5 Liner Removal/Transport	yd^3	$4.00	200	$ 800
1.1.6 Disposal Liner	yd^3	$4.25	200	$ 850
1.2 Pond Backfill and Contouring				
1.2.1 Purchase Soil	yd^3	$1.00	0	$ -
1.2.2 Place and Compact Soil	yd^3	$1.90	15,000	$ 28,500
1.3 Seeding	acres	$1,200	28	$ 33,600
Pond Closure Subtotal:			$	167,999
2.0 Site Work				
2.1 Tank Removal	Lump Sum		$	25,000
2.2 General Contouring	Lump Sum		$	10,000
Site Work Subtotal:			$	35,000
3.0 Engineering				
3.1 CQA/Certification	Lump Sum		$	40,000
Engineering Subtotal:	Lump Sum		$	40,000
4.0 Totals				
4.1 Subtotal			$	242,999
4.2 Adminstration Cost (10%)			$	24,300
Total:			**$**	**267,299**

NOTES:

1. Closure costs are based on contracting with a qualified third party to complete and certify closure
2. Assume 1000 gallons of residual water in each pond
3. Assume 6" of sludge remaining in each pond at closure
4. *Site Sampling* is conducted during the CQA phase
5. $25,000 well plugging bond on file with OCD

Attachment II.4.A
Basin Disposal, Inc.
Oil Waste Evaporation Basins

Table 3
Post-closure Care and Monitoring Cost Estimate
(September 2008)

Description	Events /Year	Labor Hours	Cost	Materials Cost	Cost/yr	Total Cost /3yrs
Engineering Tasks[1]						
1. Site Inspection						
Field Services/Reporting (3 years)						
Monitoring Events	4	4	$ 75.00 hr	$ -	$ 1,200.00	$ 3,600.00
2. Recordkeeping and Reporting						
Reports	1	15	$ 75.00 hr	$ -	$ 1,125.00	$ 3,375.00
				Engineering Subtotal:	**$ 2,325.00**	**$ 6,975.00**
Maintenance Tasks						
1. Final Cover					$ -	$ -
Cover Maintenance/Vegetation					$ -	$ -
Repairs	2	1	$1,500.00 ls	$ -	$ 3,000.00	$ 9,000.00
2. Surface Water Management System					$ -	$ -
Repairs	1	8	$ 75.00 hr	$ 75.00 hr	$ 675.00	$ 2,025.00
				Maintenance Subtotal:	**$ 3,675.00**	**$ 11,025.00**
				Total:	**$ 6,000.00**	**$ 18,000.00**
				Contingency *(10% of Total Cost)*:	$ 600.00	$ 1,800.00
				Grand Total:	**$ 6,600.00**	**$ 19,800.00**

NOTES:

1. Post-closure care and monitoring costs are based on contracting with a qualified third party to conduct post-closure care
2. The activities included in this cost estimate are based on previous experience with oil waste disposal facilities located in arid climates.
3. Costs are in current dollars.
4. Estimate assumes facility is not in post closure remediation.
5. ls = lump sum

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

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ATTACHMENT II.4.B

FINANICAL ASSURANCE DOCUMENTATION

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

August 9, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. P-326-936-560

Mr. Jerry Sandel
Basin Disposal, Inc.
P.O. Box 100
Aztec, NM 87401

RE: $140,000 Financial Assurance for
Commercial Surface Waste Management Facility Permit NM-01-0005
Basin Disposal, Inc., Principal
Citizens Bank of Farmington, Surety
Letter of Credit No. 2216

Dear Mr. Sandel:

The New Mexico Oil Conservation Division hereby approves the above-referenced Commercial Waste Management Facility Letter of Credit.

Sincerely,

Rand Carroll,
Legal Counsel

RC:mjk

Enclosure: Copy of Letter of Credit No. 2216

xc with attachment: Aztec OCD Office

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division

Irrevocable Letter of Credit For Waste Management Facilities

(File with Oil Conservation Division, 2040 South Pacheco Street, Santa Fe, New Mexico 87505)

LETTER OF CREDIT NO. 2216

Citizens Bank of Farmington [Name of Issuing Bank] (Issuing Bank), a corporation organized and existing under the laws of the State of New Mexico, and authorized to do business in the State of New Mexico with a duly appointed resident agent in the State of New Mexico, hereby establishes this Irrevocable Letter of Credit for the use and benefit of the Oil Conservation Division of the Energy, Minerals and Natural Resources Department (the "Division") pursuant to Section 70-2-12 NMSA 1978, as amended for an aggregate amount not to exceed $ 140,000.00 ($40,000.00) [closure cost estimate] in United States dollars ("Face Amount") effective immediately. This Letter of Credit is established for Basin Disposal, Inc. , (an individual, partnership, or a corporation organized in the State of New Mexico , with its principal office in the City of Farmington , State of New Mexico , and authorized to do business in the State of New Mexico), as PRINCIPAL.

The conditions of this obligation are such that:

1. The Principal has or may enter into the collection, disposal, evaporation, remediation, reclamation, treatment or storage of produced water, drilling fluids, drill cuttings, completion fluids, contaminated soils, BS&W, tank bottoms, waste oil and/or other oil field related waste in Section 3 , Township 29N , Range 11W , NMPM, San Juan County, New Mexico (the Facility).

2. This Letter of Credit is irrevocable for a term of not less than five (5) years and is conditioned upon substantial compliance by the Principal with all applicable statutes of the State of New Mexico and all rules and orders of the Oil Conservation Commission and Division, and upon clean-up of the facility site by the Principal to the standards set by the Division.

3. This Letter of Credit will expire on (a) 7/15/04 [not less than five (5) years from the effective date of the Letter of Credit] or (b) the date upon which sufficient documents are executed by the Division to release the principal from further liability for closure of the Facility with notice to the Issuing Bank by the Division accompanied by the original Letter of Credit with directions for cancellation. This Letter of Credit shall be forfeited and collected by the State of New Mexico if not replaced by other suitable financial assurance or Letter if Credit at least 90 days before the expiration date.

4. This Letter of Credit will remain effective until the (a) expiration date or (b) the operator (principal) replaces this Letter of Credit with another acceptable form of financial assurance or (c) the Division releases the Letter of Credit pursuant to Paragraph 3 above, whichever is earlier.

5. Funds under this Letter of Credit are available against the Division's sight draft, in the form of Exhibit A, specifying Letter of Credit No. _____ delivered to the office of the Issuing Bank at _____ Citizens Bank of Farmington [address]. At the Division's sole election, the Division may present sight drafts for less than the Face Amount of this Letter of Credit so long as the aggregate amount of all sight drafts does not exceed the Face Amount. Each draft must be accompanied by a certificate in the form of Exhibit B, purportedly signed by a duly authorized representative of the Division.

6. If the Issuing Bank receives the Division's sight draft(s) and certificate(s) as provided in Paragraph 5. above on or before the expiration or termination of this Letter of Credit, the Issuing Bank will pay such amount as the Division may specify, up to an aggregate amount not to exceed the Face Amount of this Letter of Credit available to the Division, no later than the close of business, Santa Fe time, on the second business day following the Issuing Bank's receipt of the sight draft and certificate and in such a manner as the Division may specify.

7. The Issuing Bank will give prompt notice to the Principal and to the Division Director of any notice received or action filed alleging the insolvency or bankruptcy of the Issuing Bank, or alleging any violations of regulatory requirements which are reasonably likely to result in suspension or revocation of the Issuing Bank's charter or license to do business.

8. This Letter of Credit will be governed by the laws of the State of New Mexico and shall be subject to the Uniform Customs and Practice for Documentary Credit, 1983 revision, International Chamber of Commerce Publication No. 500, as the same may be amended and in effect from time to time ("UCP").

9. All communications regarding this Letter of Credit will be addressed to the Issuing Bank at Citizens Bank of Farmington [address], referencing Letter of Credit No. 2216.

Very truly yours,

_____
Surety

By: Karl Garling
(Name typed or printed)

_____
(Authorized Signature)

Title: Senior Vice President

STATE OF NEW MEXICO
COUNTY OF San Juan)SS.

On this 13TH day of JULY, 19 99, before me personally appeared _____ and KARL GARLING, SVP, to me known to be the person (persons) described in and who executed the foregoing instrument and acknowledged that they executed the same as their free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and seal on the day and year in this certificate first above written.

My commission expires:
10/29/00
Date

Cheryl Jacobs
Notary Public

NOTARY PUBLIC

APPROVED BY:
NEW MEXICO OIL CONSERVATION DIVISION

By: Karl Garrard

Date: 8/9/99

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary
Reese Fullerton
Deputy Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

August 26, 2008

Basin Disposal, Inc.
P.O. Box 100
Aztec, NM 87410

Re: $5,000 One-Well Plugging Bond
Basin Disposal, Inc., Principal
United States Fidelity & Guaranty Company, Surety
API 30-045-26862
Disposal No. 1
2207' FNL and 1870' FWL
Section 3, Township 29 North, Range 11 West
San Juan County, New Mexico
Bond No. 01-0130-10019-88-1

Dear Sir:

We are in receipt of Rider to the above-captioned bond, however, the rider shows Travelers Casualty and Surety Company of America and our records show United States Fidelity and Guaranty Company as surety. They also reference Bond No. 400KJ7084 as the bond number and our records show 10-0130-10019-88-1.

The OCD Attorney will not approve the rider which increases the penal sum to $8,836 until we have something in writing showing that United States Fidelity and Guaranty Company is now Travelers and that the number we show is replaced by the new number.

If you would like to speak to our attorney, his name is David Brooks and he can be reached at (505) 476-3450. I had contacted Travelers both by phone and by letter on August 4, 2008 but have not received a reply.

Sincerely,

Dorothy Phillips
Bond Administrator

RIDER

Travelers Casualty and Surety Company of America
One Tower Square 3PB, Hartford, CT 06183

To be attached to and form a part of:

Bond No. 400KJ7084

Type of Bond: One Well Plugging Bond

Executed by Basin Disposal, Inc., as Principal, and by Travelers Casualty and Surety Company of America, as Surety, in favor of Oil Conservation Commission and dated 1/10/08 .

In consideration of the premium charged for the attached bond, it is hereby agreed to change:
Increase Bond Limit to $8,836.00

From:
$5,000.00

To:
$8,836.00

This rider is effective 1/1/08

This rider is executed upon the express condition that the surety's liability under said bond shall not be cumulative and shall in no event exceed the amount specifically set forth in said bond or any existing certificate changing the amount of said bond. The referenced bond shall be subject to all its agreements, limitations and conditions except as herein expressly modified.

SIGNED, SEALED AND DATED this 10th day of January, 2008.

By: _____
David Turner
Principal

Travelers Casualty and Surety Company of America

By: _____
Elizabeth Sevesind Attorney-in-Fact

*RIDER ACCEPTED BY:

_____
(Obligee)

_____
Date
*If Obligee signature required, please sign duplicate and return to Surety.

S-1234 (01-99)

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary
Reese Fullerton
Deputy Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

December 29, 2008

Basin Disposal, Inc.
P.O. Box 100
Aztec, NM 87410

Re: $5,000 One-Well Plugging Bond
Basin Disposal, Inc., Principal
United States Fidelity & Guaranty Company, Surety
API 30-045-26862
Disposal No. 1
2207' FNL and 1870' FWL
Section 3, Township 29 North, Range 11 West
San Juan County, New Mexico
Bond No. 01-0130-10019-88-1

Dear Sir:

The New Mexico Oil Conservation Division hereby acknowledges receipt of and approves Rider dated January 1, 2008 increasing the bond amount to **$8,836** and acknowledges receipt of and approves Rider dated September 17, 2008 changing the bond number to **400KJ7084.** We also acknowledge receipt of Letter of Explanation from Woods Insurance Service advising that U. S. Fidelity and Guaranty Company was purchased by St. Paul Travelers who was later purchased by Travelers Casualty and Surety Company of America who now holds bond No. 400KJ7084.

Sincerely,

David K. Brooks

DAVID K. BROOKS
Assistant General Counsel

DKB/dp

cc: Oil Conservation Division – Aztec, NM

Travelers Casualty and Surety Company of America
One Tower Square 3PB
Hartford, CT 06183

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

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ATTACHMENT II.4.C

CLOSURE DOCUMENTATION RECORD

Attachment II.4.C
Basin Disposal, Inc.
Oil Waste Evaporation Basins

Closure Documentation Record

Pond or Tank	Location		Location Closure				Revegetation			
			Liner		Tank					
Number	Lat. (Northing)	Lon. (Easting)	Removed	Tested	Cleaned	Removed	Installed	Date	Certified	Date

Date: _____ Recorded By: _____

Inspected By: _____ Certified By: _____

Comments: _____

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

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ATTACHMENT II.4.D

SITE INSPECTION CHECKLIST

Attachment II.4.D
Basin Disposal, Inc.
Oil Waste Evaporation Basins

Post-Closure Site Inspection Checklist

Date: _____ **Inspector(s):** _____

Time: _____ _____

Weather:

Temperature _____ deg. F Precipitation (last 24 hours) _____ inches

Skies _____

Wind Speed _____ mph

Wind Direction _____ *(direction blowing from)*

NOTES:
"X" indicates that a Deficiency has been noted. "P" indicates that a Photograph has been taken. "S" indicates that a Sample has been collected. Complete descriptions of Deficiencies, Photographs, and Samples are provided on attached pages. Items are referenced by Location.

Vegetation Condition

Location	Item			
	Vegetation Stress	Vegetation Dieback	Vectors	Sample

Surface Water Management System

Location	Deficiency			Sample
	Erosion/ Siltation	Structural Defect	Flow Obstruction	

NOTES: _____

_____

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 5: CONTINGENCY PLAN

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SECTION 5: CONTINGENCY PLAN

1.0 INTRODUCTION

1.1 Site Information

The Basin Disposal, Inc. (BDI) site is located in the city limits of Bloomfield, New Mexico approximately 3 miles north of the intersection of NM 550 and 64. Gated access to the site is provided off of Montana Street. A Site Location Map is provided as **Figure II.5.1**. BDI provides produced water disposal services for the oil and gas industry customers. The BDI site consists of ±28 acres.

Facility Name and Address
Basin Disposal Inc.
200 Montana Street
Bloomfield, NM 87413
Contact: Mr. John Volkerding
General Manager
Phone: (505) 632-8936

Facility Owner, Operator, and Permittee:
Basin Disposal Inc.
P.O. Box 100
Aztec, NM 87410
Contact: Mr. Jerry Sandel
President
Phone: (505) 632-8936

The site is comprised of an Oil Conservation Division (OCD) approved surface waste management facility consisting of ±28 acres. The permit (NM-01-0005) was issued by OCD in 1987 and is on a 10-year renewal cycle; the current permit was issued for a major modification in May 1999. The north area of the facility will be utilized for two additional evaporation ponds (Ponds 2 and 3). The Site Plan (**Figure II.5.2)** and the **Permit Plans** (**Volume III, Section 1**) identifies existing features and potential improvements for the BDI site.

The existing site includes several active and proposed areas as shown on **Figure II.5.2**:

- Liquids receiving, processing, and disposal area (±28 acres).
- Receiving tanks (12) (Modified site to increase to 18).
- Skimmed oil tanks (3).
- Oil heating tanks (3).
- Oil sales tanks (7). (Modifying site to 9).
- Oily water receiving tanks (3).
- Filtered water tanks (3).
- Bleach tanks (4).
- Evaporation pond (1) (Modified to include Ponds 2 and 3).
- Injection well system (1)
- Sludge setting tanks (2)

SITE LOCATION MAP

SURFACE WASTE MANAGEMENT FACILITY
BASIN DISPOSAL, INC.
SAN JUAN COUNTY, NEW MEXICO

Based on:
FLORA VISTA, NM (1963, PHOTOREVISED 1979),
HORN CANYON, NM (1965 PHOTOREVISED 1979),
AZTEC, NM (1985 PROVISIONAL EDITION), AND
BLOOMFIELD (1985 PROVISIONAL EDITION),
USGS 7.5' SERIES (1:24,000 SCALE TOPOGRAPHIC) QUADRANGLES.

Drawing:P:\acad 2003\520.01.01\02\FIGURES\SITE LOCATION 24K.dwg
Date/Time:Oct. 27, 2008-09:20:08

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 10/27/08	CAD: SITE LOCATION 24K.dwg	PROJECT #: 520.01.01
DRAWN BY: MLH	REVIEWED BY: IKG	FIGURE II.5.1
APPROVED BY: IKG	gei@gordonenvironmental.com	

BOREHOLE LOCATIONS	
BH-2	LAT 36°45'20.54269"N (NAD 83) LONG 107°59'02.70950"W (NAD83) ELEV: 5717.98 (GROUND)
BH-3	LAT 36°45'22.92950"N (NAD 83) LONG 107°59'04.21563"W (NAD83) ELEV: 5727.46 (GROUND)
AW-1	LAT 36°45'22.01797"N (NAD 83) LONG 107°58'55.15402"W (NAD83) ELEV: 5717.85 (TOP OF CAP)
AW-2	LAT 36°45'20.58589"N (NAD 83) LONG 107°59'02.96163"W (NAD83) ELEV: 5722.20 (TOP OF CAP)

LEGEND

- PROPERTY BOUNDARY
- 2' CONTOUR (EXISTING)
- 5700 10' CONTOUR (EXISTING)
- 2' DEPRESSION CONTOUR (EXISTING)
- 5700 10' DEPRESSION CONTOUR (EXISTING)
- ROADWAY (EXISTING)
- FENCE (EXISTING)
- PROPOSED NEW TANKS
- CULVERT
- STRUCTURE
- CONCRETE SLAB
- AW-1 ASSESSMENT WELL
- BH-3 BOREHOLE LOCATION
- TANKS
- LIGHT POLE (EXISTING)
- POWER POLE (EXISTING)
- 5705.6 SPOT ELEVATIONS

NORTH

0 100' 200'

SITE PLAN

BASIN DISPOSAL, INC.
BLOOMFIELD, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 06/05/09	CAD: SITE PLAN.dwg	PROJECT #: 520.01.01
DRAWN BY: JFP	REVIEWED BY: MRH	FIGURE II.5.2
APPROVED BY: IKG	gei@gordonenvironmental.com	

1.2 OCD Permit

BDI operates a "Surface Waste Management Facility" as defined in 19.15.2.7.S.(11) NMAC. It is authorized by the Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department under permit NM-01-0005 for the collection, disposal, evaporation, treatment and storage of produced waters, drilling fluids, drill cuttings, completion fluids, contaminated soils, bottom sediment and water, tank bottoms, waste oil or, upon written approval by the division, other oil field related waste.

1.3 Contingency Plan Requirements

This document has been prepared to address the requirements of 19.15.36.13.N NMAC which specifies that each operator of a surface waste management facility must prepare and have available a Contingency Plan (the Plan). This Plan is designed to minimize hazards to fresh water, public health, safety or the environment from fires, explosions or an unplanned sudden or non-sudden release of contaminants or oil field waste to air, soil, surface water or ground water. Applicable provisions of this Plan will be implemented immediately whenever there is a fire, explosion or release of contaminants or oil field waste constituents that could threaten fresh water, public health, safety or the environment. This Plan is supplemented by the H2S Prevention and Contingency Plan (**Volume II, Section 3**) as a cross-reference.

This Plan is organized for easy reference by site personnel, all of whom will be required to read it. Copies of this Plan are maintained in a readily accessible location at the Site Office. In addition, copies of the Plan will be made available to the emergency agencies identified in **Table II.5.1**. Agencies listed on **Table II.5.1** will be invited to the site for the purposes of familiarizing themselves with the facility and reviewing the Plan's contents with BDI [19.15.36.13.N.(2) NMAC]. As detailed in Section 10 of this Plan, whenever significant changes to the Plan are made, revised copies of the Plan will replace existing copies, and the agencies listed in **Table II.5.1** will be provided with the most recent Plan updates. Definitions specific to this Contingency Plan are provided in **Table II.5.2** as specified in 19.15.2.7 NMAC, and a more comprehensive list of definitions is included as **Table 1** (**Volume I, 19.15.36**).

TABLE II.5.1
Emergency Response Agencies and Contacts
(Updated 08/2008)

Agency/Organization	Emergency Number
Fire	
Bloomfield Fire Department	911 or (505) 632-6363
Police	
San Juan County Sheriff's Department	911 or (505) 334-1180
New Mexico State Police	911 or (505) 325-7847
Medical/Ambulance	
San Juan Regional Medical Center 801 West Maple Farmington, NM 88220	911 or (505) 325-5011
Response Firm	
Envirotech, Inc. 5796 Highway 64. Farmington, NM	(505) 632-0615
OCD Emergency Response Contacts	
Oil Conservation Division 1000 Rio Brazos Aztec, NM 87410	(505) 334-6170
Mobile Phone	(505) 320-0292
Oil Conservation Division 1220 South St. Francis Drive Santa Fe, NM 87505	(505) 476-3440
State Emergency Response Contacts	
New Mexico Environment Department Solid Waste Bureau, Santa Fe	(505) 827-0197
Hazardous and Radioactive Materials Bureau, Santa Fe	(505) 827-1557
Spill Emergencies 24 hr. Hotline (NMED)	(505) 827-9329
Other Local Emergency Response Contacts	
San Juan County Emergency Response	(505) 334-1180
Federal Emergency Response Contacts	
National Emergency Response Center (U.S. Coast Guard)	(800) 424-8802
Region VI 24 hr. Emergency Response Hotline (USEPA)	(214) 665-2222

TABLE II.5.2
Definitions

Barrel: *shall mean 42 United States gallons measured at 60 degrees Fahrenheit and atmospheric pressure at the sea level.* [19.15.2.7.B.(3) NMAC]

Division: *shall mean the New Mexico energy, minerals and natural resources department, oil conservation division.* [19.15.2.7.D.(4) NMAC]

Fresh water: *(to be protected) includes the water in lakes and playas (regardless of quality, unless the water exceeds 10,000 mg/l TDS and it can be shown that degradation of the particular water body will not adversely affect hydrologically connected fresh ground water), the surface waters of streams regardless of the water quality within a given reach, and underground waters containing 10,000 mg/l or less of TDS except for which, after notice and hearing, it is found there is no present or reasonably foreseeable beneficial use that contamination of such waters would impair.* [19.15.2.7.F.(3) NMAC]

Hazard to public health:
exists when water that is used or is reasonably expected to be used in the future as a human drinking water supply exceeds at the time and place of the use, one or more of the numerical standards of Subsection A of 20.6.2.3103 NMAC, or the naturally occurring concentrations, whichever is higher, or if a toxic pollutant as defined at Subsection WW of 20.6.2.7 NMAC affecting human health is present in the water. In determining whether a release would cause a hazard to public health to exist, the director investigates and considers the purification and dilution reasonably expected to occur from the time and place of release to the time and place of withdrawal for use as human drinking water. [19.15.2.7.H.(2) NMAC]

Oil field waste:
shall mean waste generated in conjunction with the exploration for, drilling for, production of, refining of, processing of, gathering of or transportation of oil, gas or carbon dioxide;–waste generated from oil field service company operations; and waste generated from oil field remediation or abatement activity regardless of the date of release. Oil field waste does not include waste not generally associated with oil and gas industry operations such as tires, appliances or ordinary garbage or refuse unless generated at a division-regulated facility, and does not include sewage, regardless of the source. [19.15.2.7.O.(3) NMAC]

Release: *shall mean all breaks, leaks, spills, releases, fires or blowouts involving oil, produced water, condensate, drilling fluids, completion fluids or other chemical or contaminant or mixture thereof, including oil field wastes and gases to the environment.* [19.15.2.7.R.(4) NMAC]

Waste (non-hazardous):
Non-hazardous waste shall mean non-exempt oil field waste that is not hazardous waste. [19.15.2.7.W.(1) NMAC]

2.0 EMERGENCY COORDINATORS

BDI has designated specific individuals with the responsibility and authority to implement response measures in the event of an emergency which threatens freshwater, public health, safety or the environment [19.15.36.13.N(3) NMAC]. The Primary, Alternate, and On-site Emergency Coordinators (ECs; **Table II.5.3**) are thoroughly familiar with all aspects of this Plan; operations and activities at the facility; location and characteristics of waste to be managed; the location of all records within the facility; and the facility layout. **Table II.5.3** lists the names, designations, titles, home addresses, and office, home, and cellular phone numbers for each EC.

TABLE II.5.3
List of Emergency Coordinators
(Updated 08/2008)

Primary Emergency Coordinator

Name:	John Volkerding, Ph.D.	Home Phone: (505) 327-1061
Title:	General Manager	Mobile Phone: (505) 320-2840
Address:	4105 Skyline	Work Phone: (505) 334-3013
	Farmington, NM 87401	

Alternate Emergency Coordinator*

Name:	Jimmy Barnes	Home Phone: (505) 324-1164
Title:	Plant Manager	Mobile Phone: (505) 486-3078
Address:	3925 Rochester Ave	Work Phone: (505) 632-8936
	Farmington, NM 87402	

Onsite Emergency Coordinator*

Name:	Jimmy Barnes	Home Phone: (505) 324-1164
Title:	Plant Manager	Mobile Phone: (505) 486-3078
Address:	3925 Rochester Ave	Work Phone: (505) 632-8936
	Farmington, NM 87402	

**Or as designated by BDI.*

The EC's are responsible for coordinating emergency response measures and have the authority to commit the resources required for implementation of this Plan. A designated EC is available to respond to emergencies 24 hours a day, 7 days a week. The BDI employee who identifies an emergency situation will contact an EC directly or via phone. Contact will

be attempted with each EC (Primary, Alternate, and the On-site) until communication is achieved (**Table II.5.3**). Upon arrival at the scene of an emergency, the first EC to arrive will assume responsibility for initiated response measures. If more than one EC responds, authority is given to the Primary EC.

In the rare case that an EC cannot be contacted in an emergency, the BDI employee who identifies the situation should make every effort to follow the emergency procedures outlined in this Plan until an EC or emergency authority (local, state, or federal; **Table II.5.1**) arrives to assist. Duties of the ECs are addressed within this Plan in detail. The term "EC" as used throughout this Plan, references the responsible EC at the scene of an emergency regardless of whether that EC is the Primary, Alternate or On-site EC, or designee. If the list of ECs changes, this Plan will be amended as described in Section 10.0.

3.0 PREVENTION MEASURES

3.1 Waste Inspection and Screening

BDI accepts non-hazardous oil field wastes at the Site. It is unlikely that hazardous wastes would be delivered to the facility, however, BDI has implemented a waste inspection and screening program at the site office to preclude acceptance of unauthorized wastes. It is also possible that hazardous materials could become a concern if they arrive with other typical waste materials [19.15.36.13.N(6) NMAC]. A Waste Inspection Form/Ticket is provided as **Attachment II.5.A**. The waste inspection and screening program has been established in order to identify hazardous materials before they become an operational liability.

3.2 Fire Prevention and Preparedness

BDI implements a variety of fire preventative and preparedness measures, as well as employee training. Preventive measures taken to avoid fires include regular inspections of incoming vehicles to identify incompatible or problematic wastes, and any indication of suspect loads.

A list of available emergency response equipment is provided in **Table II.5.4** in accordance with the requirements of 19.15.36.13.N(4) NMAC. Control preparation procedures for potential fire emergencies include:

- Placement and maintenance of ABC type fire extinguishers in structures and equipment.
- Implementation of a site-wide communication network to optimize mobilization of appropriate response personnel and equipment.
- Well established emergency response procedures, documented and posted.

Employee fire prevention and preparedness training may include the following:

- Training of equipment operators to identify suspect incompatible problematic wastes loads and measures for mitigation.
- Training of site personnel in waste screening (see Section 3.1), flammables identification, etc.
- Training on fire response technique, notification procedures, fire response equipment, etc.

TABLE II.5.4
Emergency Response Equipment List

Equipment Description	Quantity	Location	Use(s)
10 lb ABC rated fire extinguisher	2	Site Office	Firefighting
10 lb ABC rated fire extinguisher	2	Trucks	Firefighting
10 lb ABC rated fire extinguisher	1	Heavy Equipment	Firefighting
20 lb ABC rated fire extinguisher	1	Oil Treating Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Concrete Slab	Firefighting
20 lb ABC rated fire extinguisher	1	Oil Sales Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Oil Separation Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Water Receiving Tanks 1-4	Firefighting
20 lb ABC rated fire extinguisher	1	Water receiving Tanks, Amigo	Firefighting
20 lb ABC rated fire extinguisher	1	Pump House	Firefighting
20 lb ABC rated fire extinguisher	1	Diesel Storage Tank	Firefighting
20 lb ABC rated fire extinguisher	1	Conoco SJGP Inlet Line	Firefighting
Loader	1	Facility	Berm Repair
Bobcat	1	Facility	Berm Repair
Oil Booms	4	NE Corner of Pond	Oil Containment
SCBA	1 per employee	Site Office	Protective gear for employees
Pair leather gloves	1 per employee	Assigned to employee	Protective gear for employees
NOMEX Coveralls	7 per Employee	Assigned to Employee	Protective gear for employees
Pair safety glasses	1 per employee	All employee workstations	Protective gear for employees
Round-point wood handle shovels	2	Shop	Contain spillage, putting out fires
Round-point wood handle shovels	2	20 um Filter House	Contain spillage, putting out fires
First Aid Kit	1	Site Office	First Aid
First Aid Kit	1 per vehicle	Facility Vehicles	First Aid
Eye Wash Station	1	SE Corner of Water Receiving Tanks	First Aid
Portable 2-way radio	1 per employee	Base unit at Site Office	Communications
Cell Phones	4	General Manager Plant Manager Plant Supervisor Office Supervisor	Communications
Office Phone	1	Site Office	Communications
Mobile pressure washer	1	Mobile	Decontamination equipment

4.0 IMPLEMENTATION, ASSESSMENT, AND NOTIFICATION

The following subsections present a series of procedures for implementation, assessment, and notification of appropriate authorities in the event that a specific emergency develops [19.15.36.13.N(1) NMAC].

4.1 Implementation

The Contingency Plan will be implemented when an imminent or actual emergency situation develops that represents a potential impact to freshwater, public health, safety or the environment. Situations that could require implementation of this Plan include:

- fire/explosions
- release of contaminants or oil field waste constituents

Table II.5.5 lists the implementation, assessment, and notification procedures that will be followed in the case of an emergency. Assessment and notification are discussed further in subsections 4.2 and 4.3.

TABLE II.5.5
Implementation, Assessment, and Notification Procedures for Releases
(Breaks, Leaks, Spills, Releases, Fires or Blowouts)

1. **NOTIFY THE ECs:** The employee who first becomes aware of the emergency will immediately notify the Primary EC, and the Alternate EC and On-site EC if necessary. Notification will be made in person, via telephone, or via radio. The responding EC will assume full authority over the situation.
2. **ASSESS SOURCE, AMOUNT, AND EXTENT OF RELEASE:** The EC will assess the source, amount, and extent of any spill or release, or released material resulting from a fire or explosion and determine possible hazards to fresh water, public health, safety or the environment.
3. **CONTROL MEASURES OR EVACUATION:** The EC's assessment of the emergency situation will be the basis for attempting to control the release or for implementing an evacuation, as well as for notifying the appropriate state and local authorities if their assistance is needed. **Table II.5.7** provides Evacuation Procedures and a Site Evacuation Plan is provided as **Figure II.5.3** (also refer to control measures in Section 5.0).
4. **CONTAIN AND PREVENT SPREAD OF RELEASE:** If deemed safe by the EC, the appropriate BDI response equipment and personnel will be dispatched to the scene of the release. Personnel will initiate actions within their scope of training to contain the release and prevent the spread and/or windblown dispersion of the release. Depending on the type of release, appropriate equipment may include deployment of absorbents for spills, fire extinguishers, and/or earthmoving equipment.

5. **NOTIFICATION OF EMERGENCY AUTHORITIES:** If the EC's assessment indicates a need to notify appropriate state and local emergency authorities, notification will be initiated immediately. A list of state and local response agencies with phone numbers is provided as **Table II.5.1**. OCD will be notified as necessary in accordance with **Table II.5.6** (Release Notification and Corrective Action).
6. **DIVERT TRAFFIC AND RESTRICT PERSONS FROM AREA:** BDI personnel not actively involved in release control operations will be restricted from the area until the area is determined to be safe by the EC and, if appropriate, the on-scene senior emergency authority (i.e., fire, police, hazard or other official). Vehicular traffic will be diverted away from release response activities until the situation is abated.

4.1.1 Fires/Explosions

Potential scenarios for fires include ignition of mobile equipment while operating or during servicing, or the ignition of oil contaminated wastes. It is also possible that a chemically incompatible material may be transported to the facility. Personnel are trained in the prevention and control of fires or explosions.

4.1.2 Spills/Releases

The spill or release of a hazardous material at BDI is most likely to involve fuel or various vehicle maintenance materials (i.e., engine oil, hydraulic oil, antifreeze, etc.). Routine releases will be managed according with the protocol outlined in the **Operations, Inspection, and Maintenance Plan (Volume II, Section 1)**. Other materials most likely to present a concern as a result of normal operations include petroleum products and petroleum wastes brought into the facility. Spills involving these types of materials could occur during fueling, routine maintenance operations or during unloading or processing of waste. In addition, the possibility exists for a spill of hazardous material that may be inadvertently transported to the facility. Although highly unlikely, spill/releases from pond and tanks on-site are described in Section 5.2.

4.2 Assessment

In the event of a spill, release, fire, or explosion the EC will immediately identify the character, source, amount and extent of released materials as feasible as well as assessing the potential impact to fresh water, public health, safety or the environment [19.15.36.13.N(10) NMAC]. During an emergency, the EC may amend this Plan as necessary to protect fresh water, public health, safety or the environment [19.15.36.13.N(14) NMAC]. The EC will also

assess the circumstances of an emergency situation and determine the responses required to:

- provide notifications to appropriate agencies
- implement appropriate recordkeeping procedures

The assessment provides the EC with critical data needed to determine whether an evacuation is necessary, whether emergency authorities are needed, and whether BDI will attempt to control the release with on-site personnel and equipment. **Table II.5.6** provides OCD descriptions of "major" and "minor" releases which are useful for assessment purposes. This section contains additional detailed information regarding the Site Evacuation Plan, and Section 5.0 addresses control restrictions.

4.2.1 Site Evacuation Plan

Based upon operational safeguards and the type of waste materials received at BDI, the likelihood of a facility evacuation is unlikely [19.15.36.13.N(5) NMAC]. In an emergency situation, the EC is the individual responsible for determining when evacuation of the facility is required. Imminent or actual dangers that constitute a situation that could require evacuation include:

- A generalized fire or threat of fire that cannot be avoided.
- An explosion or the threat of explosion that cannot be averted.
- A major spill or leak that cannot be contained and constitutes a potential threat to human health or the environment.

When conditions warrant immediate evacuation of on-site persons (e.g., facility personnel, transporters, visitors, vendors, etc.) will be directed to proceed immediately to the Site Office, BDI's primary evacuation route. BDI Personnel will exercise good judgment and common sense in using the primary evacuation route to exit the facility, or selecting the most appropriate alternative evacuation route if necessary. Assembly points, primary and alternative evacuation routes are provided on **Figure II.5.3**. Driving directions to the nearest hospital are included as **Figure II.5.4**. **Table II.5.7** provides detailed procedures for evacuating the facility.

TABLE II.5.6
Part 29: Release Notification

19.15.29.7 DEFINITIONS:

A. "Major release" means:

(1) an unauthorized release of a volume, excluding gases, in excess of 25 barrels;

(2) an unauthorized release of a volume that:

- **(a)** results in a fire;
- **(b)** will reach a watercourse;
- **(c)** may with reasonable probability endanger public health; or
- **(d)** results in substantial damage to property or the environment;

(3) an unauthorized release of gases in excess of 500 MCF; or

(4) a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC.

B. "Minor release" means an unauthorized release of a volume, greater than five barrels but not more than 25 barrels; or greater than 50 MCF but less than 500 MCF of gases.

19.15.29.8 RELEASE NOTIFICATION:

A. The person operating or controlling either the release or the location of the release shall notify the division of unauthorized release occurring during the drilling, producing, storing, disposing, injecting, transporting, servicing or processing of oil, gases, produced water, condensate or oil field waste including regulated NORM, or other oil field related chemicals, contaminants or mixture of the chemicals or contaminants, in accordance with the requirements of 19.15.29 NMAC.

B. The person operating or controlling either the release or the location of the release shall notify the division in accordance with 19.15.29 NMAC with respect to a release from a facility of oil or other water contaminant, in such quantity as may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC.

19.15.29.9 REPORTING REQUIREMENTS: The person operating or controlling either the release or the location of the release shall provide notification of releases in 19.15.29.8 NMAC as follows.

A. The person shall report a major release by giving both immediate verbal notice and timely written notice pursuant to Subsections A and B of 19.15.29.10 NMAC.

B. The person shall report a minor release by giving timely written notice pursuant to Subsection B of 19.15.29.10 NMAC.

19.15.29.10 CONTENTS OF NOTIFICATION:

A. The person operating or controlling either the release or the location of the release shall provide immediate verbal notification within 24 hours of discovery to the division district office for the area within which the release takes place. In addition, the person shall provide immediate verbal notification of a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC to the division's environmental bureau chief. The notification shall provide the information required on form C-141.

B. The person operating or controlling either the release or the location of the release shall provide timely written notification within 15 days to the division district office for the area within which the release occurs by completing and filing form C-141. In addition, the person shall provide timely written notification of a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC to the division's environmental bureau chief within 15 days after the release is discovered. The written notification shall verify the prior verbal notification and provide appropriate additions or corrections to the information contained in the prior verbal notification.

19.15.29.11 CORRECTIVE ACTION: The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.

Based on:
2008 GOOGLE EARTH IMAGE
AZTEC, NM (2005 USGS DOQQ'S)

LEGEND

- SITE BOUNDARY
- EVACUATION ROUTE
- PRIMARY MEETING POINT
- SECONDARY MEETING POINT

NORTH

0' 150' 300'

SITE EVACUATION PLAN

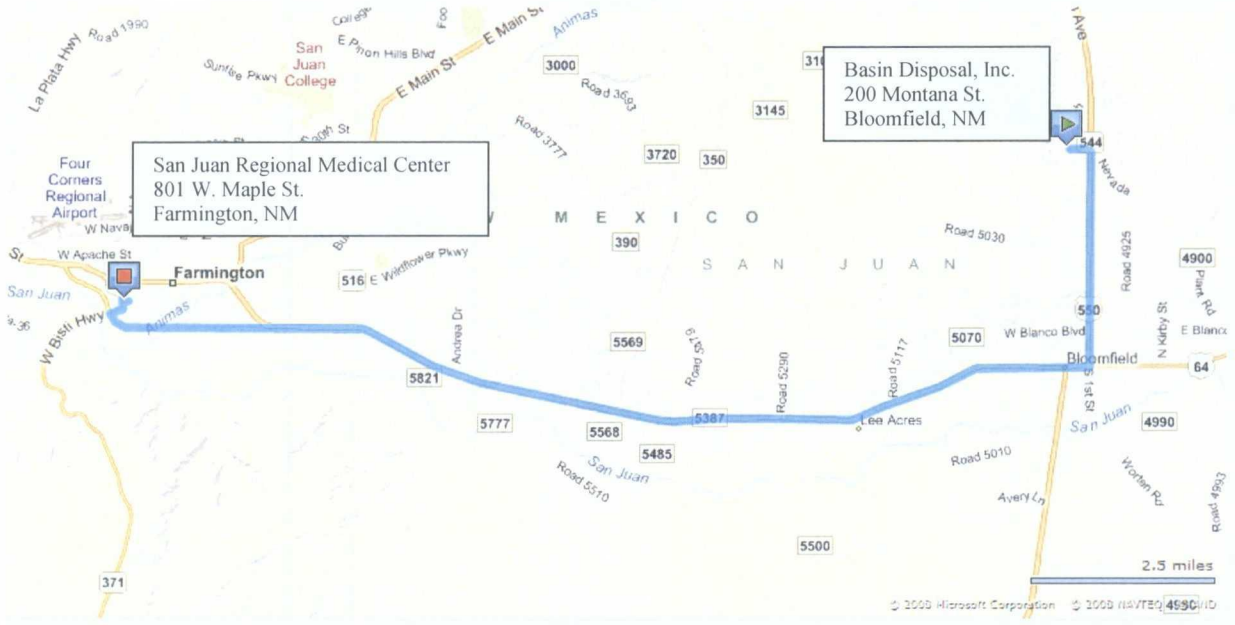
SURFACE WASTE MANAGEMENT FACILITY
BASIN DISPOSAL, INC.
SAN JUAN COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 10/27/08	CAD: EVAC AERIAL.dwg	PROJECT #: 520.01.01
DRAWN BY: MLH	REVIEWED BY: IKG	FIGURE II.5.3
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\520.01.01\02\FIGURES\EVAC AERIAL.dwg
Date/Time:Oct. 27, 2008-09:50:58

Figure II.5.4
Hospital Location



Driving Directions

FROM:
Basin Disposal, Inc.
200 Montana Street
Bloomfield, NM 87413
(505) 632-8936

TO:
San Juan Regional Medical Center
801 W. Maple Street
Farmington, NM 87401
(505) 325-5011

STEP	DIRECTIONS	DISTANCE	TOTAL DISTANCE
1	Starting at 200 Montana Street, bear right onto Nevada	0.3	0.3
2	Turn right onto US-550 South	3.0	3.3
3	Turn right to stay on US-64/US-550/W. Broadway Ave.	11.7	15.0
4	Keep straight onto E. Murray Dr.	1.2	16.2
5	Keep straight onto W. Murray Dr./US-64 West	1.0	17.2
6	Turn right onto SR-371 North/W. Pinon St.	0.2	17.4
7	Turn left to stay on SR-371/S. Lake St.	0.1	17.5
8	Turn right onto W. Maple St. and arrive at 801 W. Maple St.	0.1	17.6
			Estimated Travel Time = 29 minutes

TABLE II.5.7
Evacuation Procedures

When evacuation is required, the following procedures will be followed:

1. Facility personnel will be alerted directly or using the facility telephone, cellular telephones, or radios.
2. Vehicles delivering waste will be diverted away from the location of the emergency and routed towards the facility exit (**Figure II.5.2**).
3. All facility operating equipment will be shut down.
4. Personnel will be directed to proceed to the Site Office, which will be the designated emergency response coordination location. The EC will identify missing persons at that time.
5. If the emergency involves the Site Office or its immediate environs, the intersection of Montana and SR 550 will be the secondary assembly point for facility personnel.
6. Once assembled, personnel will stand by to afford assistance, if and as needed, or evacuate through Site Office.

4.3 Notification of Authorities

The following discussion presents a series of procedures for implementation and notification of appropriate authorities in the event that a specific emergency develops [19.15.36.13.N(1) NMAC]. Whenever there is an imminent or actual emergency, the EC will immediately notify on-site persons (facility personnel, visitors, vendors, transporters, etc.) of the emergency via on-site communication systems, as well as notify the appropriate state and local agencies as necessary [19.15.36.13.N(9) NMAC].

Table II.5.1 provides a list of emergency response agencies and contacts that may need to be notified depending on the type and extent of an emergency situation. **Table II.5.1** will be posted as appropriate and near on-site telephones for easy access by BDI personnel. Fire, police, and medical authorities should be contacted as necessary in an emergency situation (**Table II.5.1**). The adjacent businesses should be notified if there is an immediate threat to human health and the environment in the area, such as fire, explosions or H_2S release.

In the case of an H_2S emergency where $H_2S \geq 20$ ppm site personnel will follow the H2S plan in **Volume II, Section 3.** However, notification will be provided to the New Mexico State Police, Bloomfield Police, San Juan County Sheriff, and OCD (also included on **Table II.5.1**):

- OCD
  Aztec, NM (505) 334-6170
  Mobile Phone (505) 320-0292
  Santa Fe, NM (505) 476-3440
- New Mexico State Police 911 or (505) 325-7847
- San Juan County Sherriff's Dept. 911 or (505) 334-6622
- Bloomfield Police Dept. 911 or (505) 634-1062

BDI will also notify Envirotech if necessary (**Table II.5.1**) to provide response personnel, equipment, and supplies to mitigate the source of an H2S reading of H2S ≥10 ppm at the property boundary.

Table II.5.8 provides specific information regarding notification of OCD in the case of a release, which by definition includes breaks, leaks, spills, releases, fires or blowouts (**Table II.5.2**). In addition, **Table II.5.6** also provides OCD definitions for "major" and "minor" releases.

Additional State, Federal, and other local emergency contact numbers are provided and should be used as deemed appropriate to the situation. If the EC determines that the incident could threaten fresh water, human health, public safety or the environment beyond the limits of the facility, the EC will notify the National Response Center and New Mexico Environment Department (NMED) spill emergencies at the following phone numbers (also included on **Table II.5.1**):

- National Response Center - 24 Hr. Hotline: (800) 424-8802
- NMED Spill Emergencies - 24 Hr. Hotline: (505) 827-9329

The EC's notification to authorities must include all of the following information, as listed on the Emergency Response Record Keeping Form:

- name and telephone number of person reporting the incident
- name and address of facility
- time and type of incident (e.g., hazardous material release, fire)
- name and quantity of material(s) involved, to the extent known
- extent of injuries, if any
- possible hazards to human health or the environment

5.0 CONTROL PROCEDURES

This section provides information for the EC and BDI personnel regarding control procedures for different types of releases including fires, explosions, spills, and releases. The focus of the EC's initial efforts will be the protection of facility personnel and those using the facility. Control procedures should only be implemented by the EC and BDI personnel once an assessment of the situation and possible hazards to fresh water, public health, safety or the environment has been completed. Persons should not attempt to contain or control any fires, explosions, spills, leaks, breaks, or blowouts that are beyond the scope of their safety and training. Once the appropriate state and local agencies arrive on scene, these authorities will take control of the situation.

The following subsections provide the EC and BDI personnel with specific control procedures for emergency situations. Note that in the case of an H_2S emergency situation, the procedures outlined in **Volume II, Section 3** should be followed.

5.1 Fire Control Guidelines

Fire response equipment available at BDI is identified on **Table II.5.4**. Fire control efforts will not be initiated until any untrained personnel or customers are at a safe distance. The following general guidelines for fire control will be followed in the event of a fire or explosion at BDI:

TABLE II.5.8
Fire/Explosion: Control Guidelines

1. **INITIATE FIRE CONTROL:** The EC and BDI personnel will initiate response actions within the scope of their training to control the spread of the fire.
2. **P.A.S.S. METHOD:** Fires will generally be controlled with ABC type fire extinguishers using the P.A.S.S. method (Pull pin, Aim nozzle, Squeeze trigger, Sweep from side to side to extinguish).
3. **SMOTHER METHOD:** Fires may also be smothered with cover materials (i.e., soil, caliche) when possible to extinguish.
4. **AVAILABLE WATER SOURCES:** Fires may be doused or hosed with available water hoses or buckets of water, etc.
5. **EVACUATE AND NOTIFY EMERGENCY AUTHORITIES:** If at any time the scope of the fire is beyond the capabilities of BDI personnel to contain and/or extinguish it, the EC will contact the local Fire Department or the San Juan County Response Team (**Table II.5.1**) for assistance. All personnel will be instructed to evacuate the area.
6. **MONITOR SITUATION:** The EC will monitor for leaks, pressure buildup, gas generation or rupture in valves, pipes or equipment as appropriate [19.15.36.13.N(11) NMAC].

After responding to the incident, the EC will meet with involved personnel to assess the cause of the fire and document the incident. The Incident Report Form (**Attachment II.5.B**) will reflect the details of any emergency and the resulting actions. The identified causative agent will be removed from the vicinity of the facility if the possibility of re-ignition exists. Appropriate actions to prevent recurrence of fire will be developed and implemented. Personnel involved with the handling, transport, and placement of materials at the facility will be informed of the resultant actions. Significant changes in operating protocol or procedures resulting from this meeting will be documented and added as an amendment to the Plan (see Section 10.0).

5.2 Spills/Release Control Guidelines

The waste inspection and screening program (see Section 3.0) has been implemented in order to intercept potential unauthorized wastes inadvertently delivered to BDI before they are unloaded at the facility. Emergency equipment for response to such releases includes but is not limited to the items provided in the Emergency Response Equipment List (**Table II.5.4**). Containment/control and characterization of potential releases will wait until any untrained personnel are at a safe distance. At that point, the EC will then implement the following procedures for managing any existing or potential release [19.15.36.13.N(6) NMAC]:

TABLE II.5.9
Spill/Release: Control Guidelines

1. **INITIATE CONTROL:** The EC and BDI personnel will initiate response actions within the scope of their training to control the spill/release.
2. **REMOVAL OR SEGREGATION:** Determine if the material can be safely removed to a designated waste inspection/segregation area for further evaluation. If the materials cannot be safely relocated, contain them for investigation and sampling using the spill control list. If necessary, shut down operations until safe conditions are restored.
3. **CONTAIN RELEASE:** Attempt to contain the release to the smallest area possible. Examples of equipment available for spill containment are non-reactive sorbent materials, oil booms, sand, shovels and heavy equipment.
4. **SAMPLING:** After isolating the contaminants and any contaminated media, inspect them to determine if sampling is appropriate. If appropriate, isolate contaminants in the waste inspection or segregation area, or in designated leak-proof containers, until characterization is complete.
5. **CLEANUP:** After the release has been contained and necessary samples have been obtained, cleanup will be initiated by removing the spilled materials, sorbent materials,

soils used for containment, etc.

6. **EQUIPMENT MONITORING:** Pertinent liners, equipment, including valves and pipes, will be monitored for leaks, pressure buildup, gas generation or rupture as appropriate [19.15.36.13.N(11) NMAC].
7. **VERIFICATION SAMPLING:** Dependent on the type of material spilled, the EC will assess requirements for cleanup verification including the collection of samples for appropriate analytical testing.
8. **DISPOSAL OR PROCESSING:** When visual and/or laboratory characterization is complete, determine appropriate processing or disposal procedures for that waste type. Send residuals for disposal to a facility that is approved for managing that type of waste.
9. **EVACUATE AND NOTIFY EMERGENCY AUTHORITIES:** If at any time the scope of the spill/release is beyond the capabilities of the on-site personnel to contain and/or extinguish it, the EC will contact the Fire Department or the San Juan County Emergency Team (**Table II.5.1**) for assistance. All personnel will be instructed to evacuate the area.

Immediately after an emergency situation, the EC will make arrangements for the segregation, storage, or disposal of any recovered wastes, water, or any contaminated materials resulting from the incident. An evaluation of the contamination will be carried out as soon as time permits to prevent any future accidents. The Incident Report Form (**Attachment II.5.B**) will reflect the details of any emergency and the resulting actions.

Although operating procedures, roadways, unloading areas, and general areas surrounding BDI will be maintained in an effort to minimize the release or spill of hazardous materials, provisions have been developed to improve procedures if an event warrants review and modification. After responding to the incident, the EC will meet with involved personnel to determine the cause of the spill. Appropriate actions to prevent its recurrence will be developed and implemented. Personnel involved with the handling and transport of hazardous materials will be informed of the procedures/protocol that is developed in response to knowledge gained from past response procedures. Significant changes in operating protocol or procedures resulting from this meeting will be documented and added as an amendment to this Plan. Plan amendments will be documented and disseminated as outlined in Section 10.0.

5.3 Clean, Replace, and Inspect Equipment

Following an emergency incident, all emergency response equipment used will be inspected, decontaminated/cleaned and made fit for re-use, or replaced as necessary, so that the equipment will be available when facility operations resume. The inspection of equipment will take place before operations resume ensuring that each item is in proper working condition. This inspection will include a review of the facility infrastructure to ensure that a potential hazard has not been created as a result of responding to the emergency. Prescribed procedures may include lock-out/tag-out on processing equipment until an inspection can be completed. Remedial activities, as a result of this inspection, may include recharging of fire extinguishers, replacement of personal protective gear, restocking of disposable items, etc. The EC will verify that response equipment has been properly decontaminated and returned to its original location and is fit for future use.

6.0 STORAGE AND TREATMENT OF RELEASED MATERIALS

Spilled or otherwise contaminated material approved for disposal at an OCD landfill will be managed in accordance with standard operating practices. Other hazardous spilled materials will be containerized, stored and disposed of in accordance with applicable local, state and federal regulatory requirements. No oil field waste, which may be incompatible with the released material, will be treated, stored, or disposed of until cleanup procedures are complete [19.15.36.13.N(12), (13) NMAC].

7.0 EMERGENCY EQUIPMENT

The following sections describe emergency equipment at BDI that is available for responding to emergency situations. An Emergency Response Equipment List describing the equipment, quantity, location, and uses is provided as **Table II.5.4**.

7.1 Internal Communications

Communications at BDI are accomplished via cellular telephones, land lines, and two-way radios. These systems provide facility personnel with immediate and redundant emergency notification capabilities, and the opportunity to receive instructions in the event of an emergency incident. Any mechanical difficulties with the communications equipment will be promptly repaired. Internal communication devices are also included on **Table II.5.4**.

7.2 External Communications

The telephones located at BDI have outside access in the event that notification of the local emergency response authorities is required (i.e., fire department, ambulance, etc.). In addition, key facility personnel including the ECs, facility General Manager, etc., carry cellular telephones for contacting outside agencies. The cellular telephones also provide a backup means for contacting emergency authorities in the event they cannot be reached by conventional telephone lines. External communication devices are also included on **Table II.5.4**.

7.3 Fire Prevention

Portable ABC type fire extinguishers are located in facility vehicles and mobile equipment, as well as within the site office, and tanks areas. Fire extinguishers are maintained in accordance with state and local fire codes and regulations and routinely serviced. On-site earthmoving equipment is available to move and apply cover material for control of smoldering loads. Cover material readily available within the 28 acre site.

7.4 Personnel Protection, First Aid, and Safety Equipment

Personal protective equipment necessary for responding to a release of hazardous materials is maintained in on-site buildings (Site Office, Maintenance Shop, and the Oil Recycling Plant) and/or issued to each employee (**Table II.5.4**). These items include Tyvek suits, gloves, safety glasses, hearing protection, etc.

First aid and safety equipment are maintained at various locations at BDI (**Table II.5.4**). Safety equipment located at the facility includes industrial first aid kits, eye wash station, etc. First aid kits will be placed in the facility office, maintenance shop and oil recycling plant. In addition, first aid kits are maintained in all facility vehicles, including heavy equipment. Prominent signs are placed identifying the location of health and safety equipment, and emergency response items (e.g., fire extinguishers).

7.5 Spill Response Equipment

Spill response equipment, including heavy equipment and hand-gear, is stored at locations around the facility (**Table II.5.4**).

8.0 RECORDKEEPING

The EC will be responsible for insuring that emergency response actions are fully documented. The Primary EC may complete the documentation requirements or delegate to another EC. The BDI Incident Report Form (**Attachment II.5.B**) illustrates the information that will be recorded as a result of any emergency incident and related response action. This form will be signed by both the EC and the facility Plant Manager. Copies of the form filed for each incident will be retained as part of the Facility Operating Record.

In addition, in the case of an unauthorized release at BDI, the OCD will be notified pursuant to 19.15.29 NMAC. As defined by OCD in **Table II.5.2**, a "release" is all "breaks, leaks, spills, releases, fires or blowouts involving crude oil, produced water, condensate, drilling fluids, completion fluids or other chemical or contaminant or mixture thereof, including oil field wastes and natural gases to the environment" (19.15.2.7.R(4) NMAC). A major release (19.15.29 NMAC; **Table II.5.6**) includes an unauthorized release of a volume in excess of 25 barrels; or of any volume which results in a fire, will reach a water course, may with reasonable probability endanger public health or results in substantial damage to property or to the environment, cause detriment to water or exceed the standards in 19.15.30 NMAC. A major release requires both immediate verbal notification (within 24 hours) as well as timely written notification to OCD (within 15 days) using form C-141 relating to release Notification and Corrective Action. A minor release (**Table II.5.6**) is an unauthorized release of greater than 5 barrels but less than 25 barrels. A minor release requires timely written notice only. A copy of form C-141 is provided as **Attachment II.5.C**. Copies of the form filed for each incident will be retained as part of the Facility Operating Record.

9.0 COORDINATION AGREEMENTS

A copy of the Contingency Plan is made available to the organizations identified in **Table II.5.1**. The Contingency Plan serves to familiarize each of the identified organizations with the operations of the facility and types of emergencies and responses that may be required. Each agency will be encouraged to visit the Facility for purposes of assessing site operations and providing input regarding emergency response procedures [19.15.36.13.N(2), (7) NMAC].

10.0 PLAN AMENDMENT

The EC will be responsible for assuring updates to or amendments of the Contingency Plan in the event of any of the following [19.15.36.13.N(8) NMAC]:

1. The Facility Permit is revised or modified.
2. The Plan fails in an emergency.
3. Modification to the Facility design, construction, operation, maintenance or other circumstances that changes the potential for fires, explosion, or releases of hazardous oil field waste constituents; or related changes in the appropriate emergency response.
4. The list of ECs changes.
5. The list of emergency equipment changes significantly.

The revised Contingency Plan will be distributed to OCD and made available to each of the organizations identified in **Table II.5.1** with a cover letter highlighting any substantive changes. Any proposed changes will be in compliance with 19.15.36.13.N NMAC (Contingency Plan).

APPLICATION FOR MODIFICATION
BASIN DISPOSAL, INC.
OIL FIELD WASTE EVAPORATION PONDS

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 5: CONTINGENCY PLAN

ATTACHMENT II.5.A

WASTE INSPECTION FORM/TICKET

DATE 9/13/08 DEL. TKT#. 17037

GENERATOR: XTO BILL TO: XTO

HAULING CO. M&R DRIVER: Brian Nez
(Print Full Name)

ORDERED BY: Jeremy Brington CODES:

WASTE DESCRIPTION: ☒ Exempt Oilfield Waste ☑ Produced Water ☐ Drilling/Completion Fluids ☐ Reserve Pit

STATE: ☑ NM ☐ CO ☐ AZ ☐ UT TREATMENT/DISPOSAL METHODS: ☒ EVAPORATION ☒ INJECTION ☒ TREATING PLANT

NO.	TRUCK	LOCATION(S)	VOLUME	TIME	AM	PM	COST	TOTAL
1	366	Davis G.C F#1R	80	76.00		X	'08 SEP 13 3:30PM	
2		H2S Treatment	240 ppm	300.00				
3								
4								
5								
							TOTAL	376.00

I, Brian Nez representitive or authorized agent for the above generator and hauler hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination that the above described waste is RCRA Exempt, Oil field wastes generated from oil and gas exploration and production operations and not mixed with non-exempt waste, per OCD's mix- policy.

☑ Approved ☐ Denied ATTENDANT SIGNATURE: Stanley Crane Jr

san juan reproduction 168-6

APPLICATION FOR MODIFICATION
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ATTACHMENT II.5.B

BDI INCIDENT REPORT FORM

Fax completed report within 24 hours to Basin Disposal, Inc. at 505-333-3898

INCIDENT REPORT FORM

THIS SECTION FILLED OUT BY EMPLOYEE

Type of Incident and General Information

- ❑ Work related Injury / Illness
- ❑ Property Damage
- ❑ Vehicular Accident
- ❑ Unsafe Act / Near Miss
- ❑ Vandalism / Criminal Activity
- ❑ Other _____

Employee Name: _____ Job Title: _____

Date of Incident: _____ Time of Incident: _____ AM/PM

Location of Incident: _____

Unit# _____ Start of Shift:_____Weather:_____

Date and Time Reported to Management : Date:_____ Time:_____ AM/PM

Reported to: _____ Title:_____ Reported by:_____

What was the injury category of incident at the time it was first reported to management ?

[ ] N/A. BDI employee does not claim an injury associated with this incident
[ ] Notice Only of Injury, Declined Medical Treatment at this time
[ ] First Aid done on site, Declined Medical Treatment at this time
[ ] Medical Treatment. Transported by _____ to _____
[ ] Fatality, BDI employee

Employee's Description of Incident / Declaración del empleado de los hechos

Were you injured ? *(Ud. se lastimó ?)* **Yes [ ]** **No [ ]**

Type of Injury: *(Tipo de lesión)* _____

Part of Body:_____ Left_____ Right_____
(Parte del cuerpo) *(Izq)* *(Der)*

Explain in your own words what happened. *(Explique en sus propias palabras lo que sucedió)*

_____

_____

_____

_____

_____

_____

_____

Employee Signature: (*Firma del empleado*) :_____

Date: (*Fecha*) _____

TO BE FILLED OUT BY BASIN DISPOSAL, INC. ACCIDENT INVESTIGATOR

Describe in order of occurrence the events leading to the accident and/or injury. Reconstruct the sequence of events that led to the accident.

_____

_____

_____

_____

_____

_____

_____

_____

Witnesses / Bystanders / Co-workers **Yes [ ] N/A (No Witnesses) [ ]**

Name: _____ Address: _____
Phone: _____ Workplace: _____
Was a Written Statement Obtained ? Yes [ ] No [ ]

Name: _____ Address: _____
Phone: _____ Workplace: _____
Was a Written Statement Obtained ? Yes [ ] No [ ]

Drug and Alcohol Post Accident Test

Is the BDI employee a D.O.T. regulated employee ? Yes [ ] No [ ]
Did the BDI employee receive a moving traffic violation ? Yes [ ] No [ ]
Were any of the vehicles involved towed away ? Yes [ ] No [ ]
Was "immediate medical treatment" required for anyone ? Yes [ ] No [ ]
Was a post accident drug/alcohol test performed ? Yes [ ] No [ ]
If so, was the D/A test conducted within 2 hours ? Yes [ ] No [ ] N/A [ ]

Investigated by: _____ (Waste Connections Employee)

Title: _____ Date: _____ Department: _____

CORRECTIVE ACTIONS. (Equipment, Practices, Environment, Retraining) Steps that have been, or will be taken to prevent recurrence:

_____

_____

_____

_____

_____

Corrective Action Completed ? ☐ YES Date Completed:_____

- I have been briefed on the corrective actions outlined above
- *Estoy consciente de las acciones correctivas mencionadas anteriormente en esta hoja*

_____

Employee's Signature / Date

REPORT REVIEWED AND CONCLUDED BY:

_____

Immediate Supervisor's Signature / Date

_____

Employee's Manager's Signature / Date

DISCIPLINARY ACTION ? ☐ YES ☐ NO
(Timely forward appropriate paperwork to BDI)

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ATTACHMENT II.5.C
OCD - RELEASE NOTIFICATION AND CORRECTIVE ACTION
FORM C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☐ Final Report

Name of Company	Contact
Address	Telephone No.
Facility Name	Facility Type

Surface Owner	Mineral Owner	Lease No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County

Latitude_____ **Longitude**_____

NATURE OF RELEASE

Type of Release	Volume of Release	Volume Recovered
Source of Release	Date and Hour of Occurrence	Date and Hour of Discovery
Was Immediate Notice Given? ☐ Yes ☐ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☐ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Describe Area Affected and Cleanup Action Taken.*

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION	
Printed Name:	Approved by District Supervisor:	
Title:	Approval Date:	Expiration Date:
E-mail Address:	Conditions of Approval:	Attached ☐
Date: Phone:		

* Attach Additional Sheets If Necessary

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VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 6: MIGRATORY BIRD PROTECTON PLAN

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SECTION 6: MIGRATORY BIRD PROTECTON PLAN

1.0 PURPOSE

This Migratory Bird Protection (MBP) for the Basin Disposal, Inc. (BDI) facility has been prepared in accordance with requirements of 19.15.36.13.I and 17.C.(3) NMAC. This Plan describes the procedures for migratory bird protection at BDI. BDI is not proposing to install screening, netting or covering over the evaporation ponds. Instead, BDI is proposing alternate procedures to fencing or netting that have proven effective in the past at discouraging bird propagation which fulfills the requirements of 19.15.36.13.I and 17.C.(3) NMAC for equal protection of migratory birds.

1.1 Plan Modifications

This MBP may be modified by BDI to address changes in site conditions and submitted to the OCD for review and approval after the proposed change. This Plan may also be amended at the request of OCD should conditions warrant.

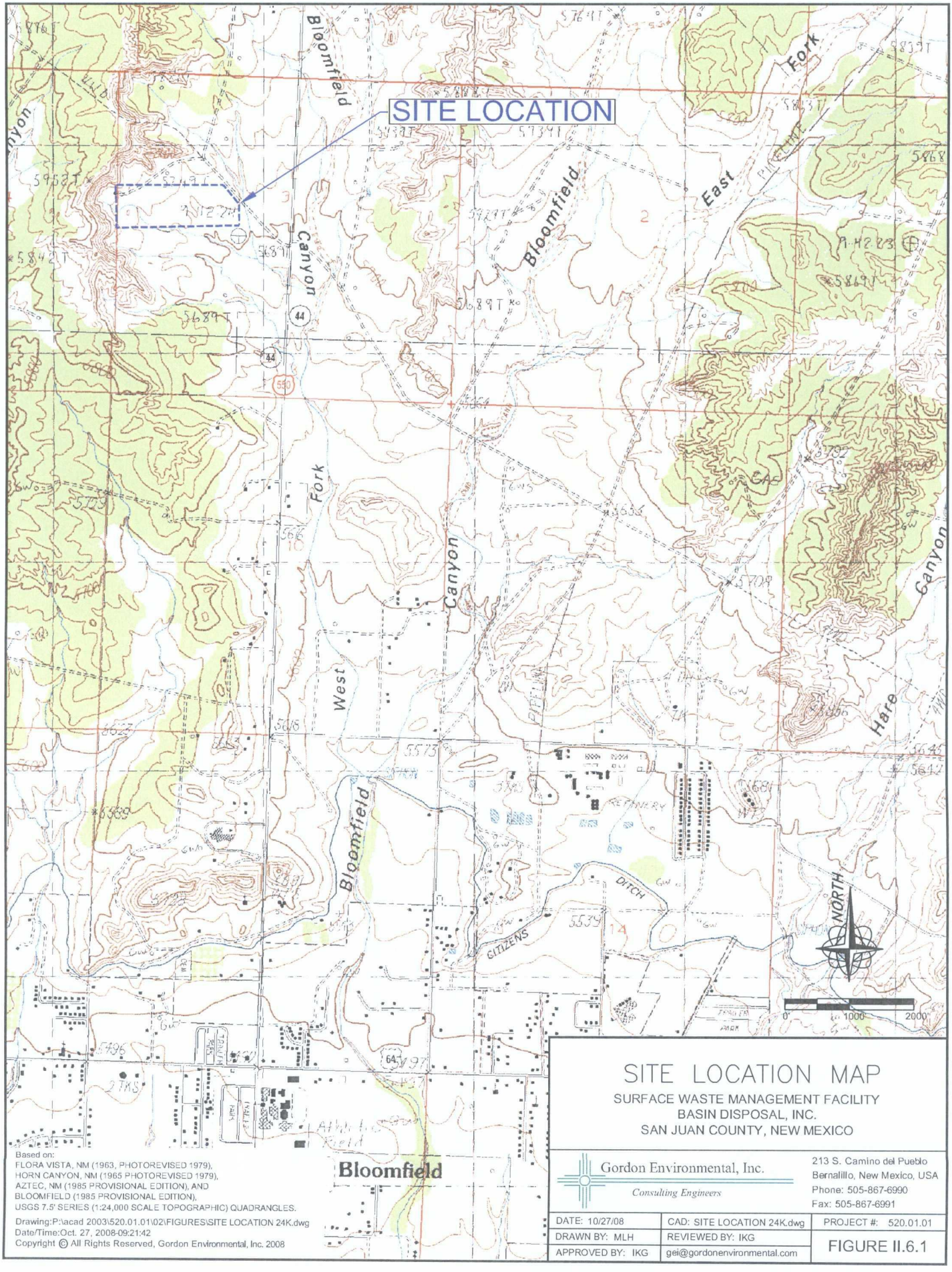
2.0 SITE DESCRIPTION

BDI is located entirely within Section 3, Township 29 North, Range 11 west approximately 3 miles north of the intersection of Highway 550 and 64 (**Figure II.6.1**). The site lies about 4 miles north of the San Juan River, and about 6 miles south of the Animas River on Crouch Mesa, about 500 feet and 400 feet above the respective river plains. The site occupies the West Fork of Bloomfield Canyon, an ephemeral drainage the drains south to the San Juan River; the site slopes gently to the east and south east, from a maximum elevation of 5,750 feet to less than 5,700 feet.

3.0 MIGRATORY BIRD PREVENTION

3.1 Historical Perspective

Since opening the facility in the late 1980's, BDI has not had an issue with aquatic migratory birds congregating around nor landing in the Evaporation Pond 1 since its construction. This is due primarily to the fact that the facility is in operation both day and night year-round and the lack of a food source at the facility. A records review and interviews with site personnel have confirmed no history of bird congregations or injuries resulting from the evaporation pond operation therefore the Facility **is in compliance with 19.15.36.17.C.(3)**.



SITE LOCATION MAP

SURFACE WASTE MANAGEMENT FACILITY
BASIN DISPOSAL, INC.
SAN JUAN COUNTY, NEW MEXICO

Based on:
FLORA VISTA, NM (1963, PHOTOREVISED 1979),
HORN CANYON, NM (1965 PHOTOREVISED 1979),
AZTEC, NM (1985 PROVISIONAL EDITION), AND
BLOOMFIELD (1985 PROVISIONAL EDITION),
USGS 7.5' SERIES (1:24,000 SCALE TOPOGRAPHIC) QUADRANGLES.

Drawing:P:\acad 2003\520.01.01\02\FIGURES\SITE LOCATION 24K.dwg
Date/Time:Oct. 27, 2008-09:21:42

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 10/27/08	CAD: SITE LOCATION 24K.dwg	PROJECT #: 520.01.01
DRAWN BY: MLH	REVIEWED BY: IKG	FIGURE II.6.1
APPROVED BY: IKG	gei@gordonenvironmental.com	

3.2 Human and Mechanical Intervention

Basin Disposal is manned by at least two employees 24 hours per day, 7 days per week, and 52 week per year. Plant Managers and employees are trained to make hourly inspection rounds making note of any migratory bird activity in or surrounding the evaporation ponds. In addition to these routine inspections, the office is situated in a manner with a full view of the Pond #1 (existing) which essentially ensures 24 hour observation of migratory bird activity. The proposed Ponds # 2 and 3 are eighty (80) percent visible from the office. BDI will continue to make hourly inspection rounds noting any migratory bird activity. Should BDI discover migratory bird activity, inspection and scare tactics frequency will be increased to alleviate the roosting of the birds.

In order to prevent oil sheen accumulation on the surface if the ponds [19.15.36.17.C.(1) NMAC], BDI on a constant basis throughout each working day, removes visible oil layers from the evaporation ponds. This is accomplished by using booms to bring the oil sheen to the banks of the ponds which is then removed by vacuum trucks and returned to the skimmer tanks.

The typical operations do not lend the facility to migratory bird congregation. The site is open 24 hours per day, 7 days per week, and 364 (+/- 1) days per year. During this time, the spray evaporation systems are in full operation, truck traffic is constantly coming and going from the facility, pumps are transferring waters to and from the ponds, and normal operational human activity during inspections is constantly in motion.

4.0 MIGRATORY BIRD LANDING CONTINGENCY

4.1 Migratory Bird Rescue

In the unlikely event a bird lands on the pond and becomes contaminated, BDI employees shall immediately utilize the boat and side ropes to retrieve the bird. Upon retrieval, BDI employees will transport the bird to the shop and either transported to a local veterinary clinic, or if only lightly soiled, oil may removed by BDI personnel using procedures adapted from those of the International Bird Rescue Research Center:

a. The bird's entire body is immersed in a one percent solution of Dawn and warm water (warm enough to approximate the bird's internal body temperature. Once wet, the bird is unable to thermo regulate) by one person while a second vigorously agitates the water into the bird's feathers.

b. A WaterPik® filled with the same solution is used to clean the head.
c. A soft toothbrush and cotton swabs are used to loosen dried oil around the head and eye area.
d. When the water becomes dirty, the bird is moved to a second pan. The washing process is repeated as often as necessary.
e. The bird is considered clean when the tub of water is clear and free of oil.
f. The bird is moved to another pan of clean warm water for rinsing.
g. A WaterPik filled with the Warm water is used to clean the head.
h. When the water becomes soapy, the bird is moved to a second pan. The rinsing process is repeated as often as.
i. The bird is considered rinsed when no soap is visible in a fresh pan of water.
j. After wash and rinse, the cleaned bird is placed in a protective net-bottomed pen. As it rests, the bird will begin to preen its own feathers back into place. The complete realignment of feathers in a tight overlapping pattern creates a waterproof seal.
k. The bird is fed a nutritious food mixture to assure proper nourishment, plenty of fluids, as well as vitamins and medications, and is allowed free access to food.
l. The bird is released when it is stable, healthy, and completed preening. The bird shall be taken to a local veterinary clinic for examination prior to release.

4.2 Screening and Netting

Although it is highly unlikely the BDI facility will have a migratory bird issues based on the above-mentioned preventative methodology, and historical lack of migratory landings, BDI is committed to the protection of migratory birds. Should migratory bird landings become an ongoing concern, BDI will implement more aggressive techniques, such as netting or screening.