# NM1 - 5

# MAJOR MODIFICATION Application

## Replacement Pages and Replaced Pages

# August 27, 2009

## Hansen, Edward J., EMNRD

**From:** Hansen, Edward J., EMNRD
**Sent:** Wednesday, August 05, 2009 3:28 PM
**To:** 'bdinc@digii.net'
**Cc:** 'Pamela Gonzales'; 'Keith Gordon'; Jordon Eng: Jim Jordon
**Subject:** NM1-5 Additional Information Required for the revised Application for Basin (Ponds #2 & #3)

Dear Dr. Volkerding:

The New Mexico Oil Conservation Division (OCD) has reviewed the revised Application for Modification – Basin Disposal, Inc. (OCD Permit #NM-01-0005) ("Updated June 2009") received on June 11, 2009. Please amend this revised application as follows:

1. On Page 36-11 of Vol. I, please edit to read: "(14)... Volume II, Section 1; Operations, Inspection, and Maintenance Plan ~~describes~~ incorporates a best management practices plan to ensure..."

2. On Page 36-15 of Vol. I, please edit to read: "(4)...pursuant to Paragraph (3) of Subsection F of ~~19.1521.7~~ 19.15.2.7 NMAC..."

3. In the title of the Table of Contents page of Section 1 of Vol. II, please edit to read: "Section 1: OPERATION, INSPECTION AND MAINTENANCE PLAN (INCORPORATING A BEST MANAGEMENT PRACTICES PLAN)"

4. On page 10 of Section 1, Vol. II, please demonstrate or correct the stated porosity of "0.65" for the granular material (e.g., 0.35)

5. On page 11 of Section 1, Vol. II, please edit to read: "Upon discovery of excessive (i.e., >2') liquid presence..."

6. On page 12 of Section 3 (3.2.2), Vol. II, please edit to read: "...to raise the pH to the ~~desired~~ optimal level of 8.2 to 9.0."

7. On page 3 of Section 4 (3.3), Vol. II, please edit to read: "Any other parameters required by the disposal facility or rule at time of closure"

8. On page 7 of Section 1 (7.0), Vol. III, please describe the exact placement for the 6 "new" proposed receiving tanks (e.g., three of the six new tanks will be placed on the east side of the three existing oil skimmer tanks and the other three new tanks will be placed on the west side of the existing oil skimmer tanks)

9. On page "A-8" of Attachment III.1.G (Pipe Wall Thickness Information), Vol. III, please provide a title and reference for this table

10. On page 4 of Section 2, Vol. III, please edit to read: "The CQA is also required by ~~NMED~~ OCD as means of demonstrating compliance..."

Replacement pages may be submitted to the OCD. OCD will then replace the pages for your convenience.

Please contact me if you have any questions regarding this matter.

Edward J. Hansen
Hydrologist
Environmental Bureau
505-476-3489

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

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## VOLUME I:
## PERMIT APPLICATION TEXT

## Replacement Pages

**(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).*

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**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**

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

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## VOLUME II:
## FACILITY MANAGEMENT PLANS

## Section 1 – Operations, Inspection and Maintenance Plan
## Replacement Pages

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# 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)

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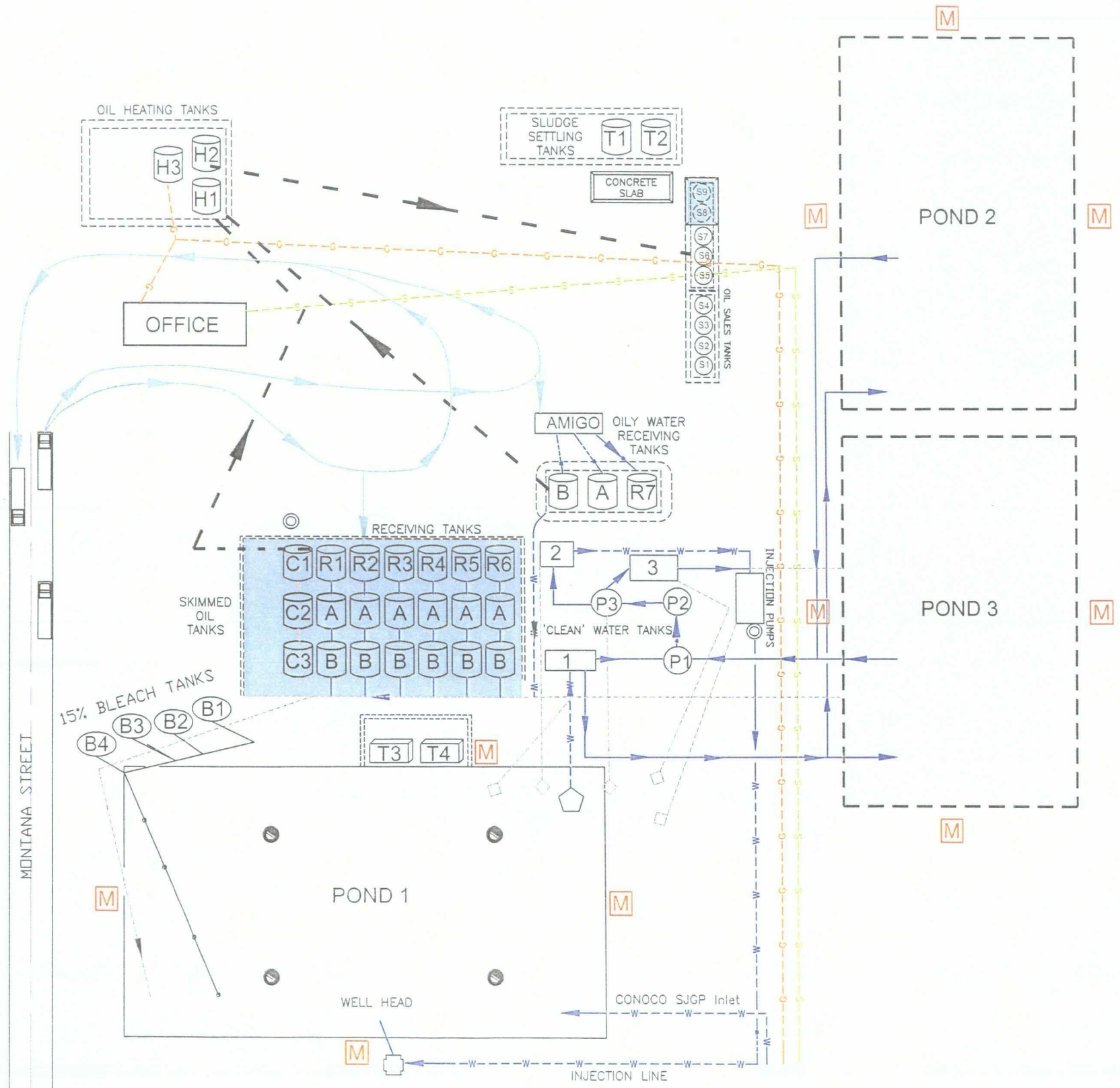


NOTE: ELEMENTS ARE LABELED IN ACCORDANCE WITH THE UPDATED NOMENCLATURE (11/08, ATTANCHMENT III.1.F)



## LEGEND

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

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 | |

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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.

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

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## VOLUME II:
## FACILITY MANAGEMENT PLANS

## Section 3 – H2S Prevention and Contingency Plan
## Replacement Pages

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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].

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# OCD Permit # NM-01-0005

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## VOLUME II:
## FACILITY MANAGEMENT PLANS

## Section 4 – C/PC Plan
## Replacement Pages

## 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

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

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## VOLUME III:
## ENGINEERING DESIGN AND CALCULATIONS

## Section 1 – Engineering Design
## Replacement Pages

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The fluids collected in the leak detection sumps will be monitored and collected by sidewall riser pipes that do not penetrate the secondary liner in compliance with §19.15.36.17.B.(9). The piping is demonstrated to resist degradation by the waste constituents as documented in **Volume III, Section 3**.

Piping will consist of min. 4" diameter SDR 11 HDPE; and will be perforated or slotted for the bottom 2' depth within the sump (i.e., 6' length at 3:1 slope). HDPE piping has shown superior characteristics for waste containment applications vs. the SCH 80 PVC specified in the OCD standards; and has a greater wall thickness as shown on **Table III.1.2**.

**Table III.1.2**
**Comparison of PVC and HDPE Pipe**

| | 4" Diameter Leak Detection Riser Pipes | |
|---|---|---|
| **Characteristic** | **Schedule 80** | **SDR 11 HDPE** |
| Dimension Ratio | 13.4 | 11.0 |
| Method of Joining | Gasketed | Welded |
| Manning's Number (n) | 0.009 | 0.010 |
| Outside Diameter (in) | 4.500[1] | 4.500[2] |
| Min. Wall Thickness (in) | 0.337[1] | 0.409[2] |
| Tensile Strength (psi) | 5,000 | 5,000 |
| Modulus of Elasticity (psi) | 400,000 | 130,000 |
| Flexural Strength (psi) | 14,450 | 135,000 |

Notes:
[1]Handbook of PVC Pipe, pg. 340 (**Attachment III.1.G**)
[2]PolyPipe, A-4 (**Attachment III.1.G**)

The details in the Permit Plans (**Sheet 7, Details 1, 2, 3, 5** and **6**) have been updated to reflect the deployment of SDR 11 HDPE piping for the leak detection sump riser pipes.

HDPE or geonet layers will be placed beneath the beveled edge of the perforated riser in the sump profile to a minimum thickness of 200 mil to prevent potential liner damage (**Permit Plan Sheet 7**). Solid HDPE piping will extend from the riser pipe above the sumps to the permanent wellheads shown on **Permit Plan Sheet 7**. Clean select sand will be placed in the sidewall riser trench between the primary and secondary liners to provide structural stability of the solid riser pipe system and support for the primary liner (**Permit Plan Sheet 7**).

OCD upon completion of construction.

## 6.0 POND OPERATION

Detailed plans for the operation of Ponds 2 and 3 are prescribed in **Volume II, Section 1**, "Operations, Maintenance, and Inspection Plan". Essentially, it is anticipated that some fluids will accumulate in the leak detection sumps as a result of condensation, construction water, etc. As described in **Volume II, Section 1**, the leak detection sumps will be monitored at least monthly for the presence of fluids, which may be extracted and tested when the level in the sump(s) exceeds 24". The design of Ponds 2 and 3 allows for isolation of potential leaks into 4 drainage basins, facilitating necessary evaluation or repair.

## 7.0 TANK SECONDARY CONTAINMENT

As proposed in this Application, two (2) additional oil sales tanks and six (6) receiving tanks will be installed. Currently, Tanks 9, 10, 11 will be moved over two tank lengths and rotated so as to be oriented east to west instead of the current north to south. The six new tanks will be repositioned in between the new skimmer tanks and the existing water receiving tanks. Detailed operations of the tanks are prescribed in **Volume II, Section 1,** "Operations, Maintenance, and Inspection Plan". The new tanks will be constructed with underlying continuous 30-mil polyester bermed liner systems, extended from the existing system and designed to capture any fluids within the watershed of Pond 1 (**Attachment III.1.C**).

The current secondary containment liner in the tank area is a 30-mil polyester liner (XR-5 8130 Reinforced Geomembrane). In the extension of the secondary containment within the tank area, a 30-mil polyester liner has been specified to allow welding between compatible materials (i.e., between the existing liner and the additional liner). The use of the XR-5 8130 Reinforced Geomembrane in the tank area is primarily based on the chemical compatibility and puncture resistance of the material compared to either PVC or HDPE material. The chemical resistance of the XR-5 material exceeds the chemical compatibility of either PVC or HDPE to hydrocarbon products (see Chemical Resistance Chart, Page 13, "Technical Data and Specifications for XR Geomembranes", **Attachment III.1.H**). Since PVC material has marginal chemical resistance in a hydrocarbon environment, physical properties of the XR-5

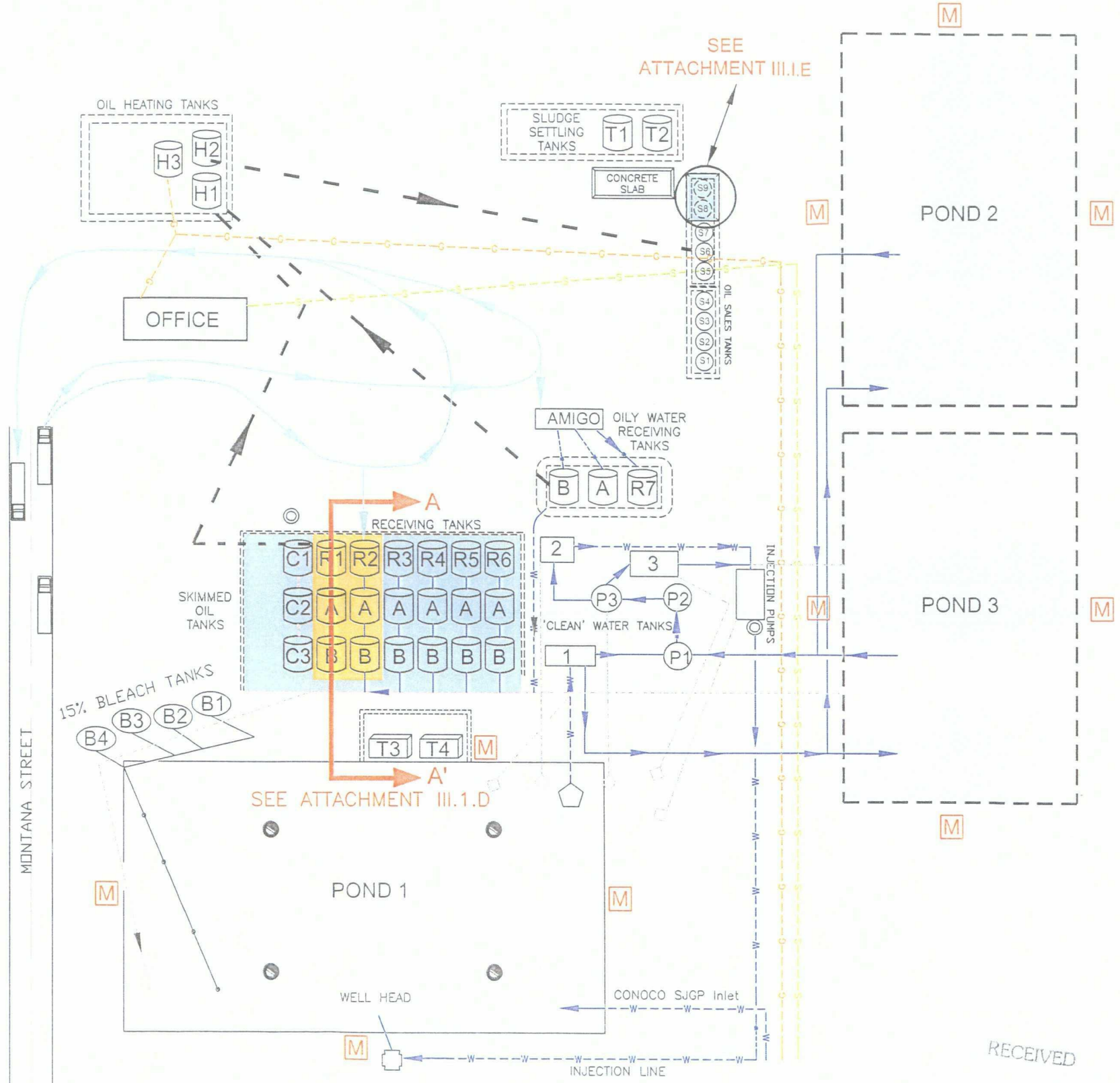
geomembrane (**Attachment III.1.H**) are compared to 60-mil HDPE geomembrane (**Attachment III.1.I**) as shown in **Table III.1.3**:

**Table III.1.3**
**Physical Properties**
**XR-5 8130 Reinforced Geomembrane and 60-mil HDPE Geomembrane**

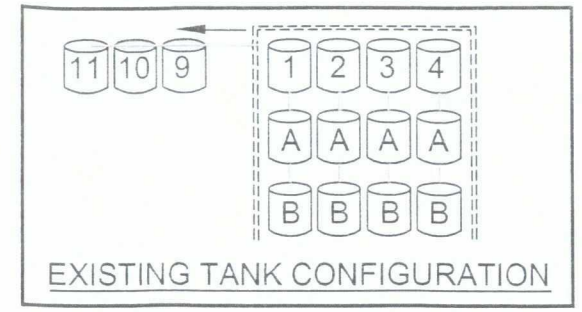
| PROPERTY | XR-5 8130 | 60-MIL HDPE |
|---|---|---|
| THICKNESS | 30-MIL | 60-MIL |
| TEAR STRENGTH | 40 LBS | 42 LBS |
| PUNCTURE RESISTANCE | 275 LBS | 108 LBS |
| BREAK STRENGTH | 400 LBS/IN | 228 LBS/IN |
| BREAK ELONGATION | 25% | 700% |
| HYDROSTATIC RESISTANCE | 800 PSI | > 450 PSI |
| HYDRAULIC CONDUCTIVITY | $1 \times 10^{-12}$ CM/SEC | $2 \times 10^{-13}$ CM/SEC |
| SEAM PROPERTIES | | |
| SHEAR STRENGTH | 500 LBS | 120 LBS/IN |
| PEEL STRENGTH | 40 LBS/2 IN | 91 LBS/IN |

The necessary storage capacity for the interconnected tank/containment system is sufficiently managed by the existing lined volume of Pond 1. In the unlikely event of a total catastrophic failure of all affected storage units, the contents of the tanks will flow into Pond 1, which has a lined storage capacity of 100,000 ± bbl (excluding freeboard). When the freeboard is included, the storage capacity of Pond 1 is over 135,000 bbl, which results in a net surplus of over 25,000 bbl. The entire volume of the receiving tanks, after installation of the six additional tank's surplus will be 8900 bbl, such that the net excess capacity is over 16,000 bbls. Thus, **Pond 1 will hold the entire volume of the receiving tanks within the required permanent freeboard of 3'.**

**Attachment III.1.D** provides details for the containment area construction planned for completion prior to installing the additional six receiving tanks into operation. The seven (7) 440 bbl existing oil sales tanks are currently surrounded by a 30 mil polyester lined bermed area with dimensions of 140 feet long x 22 feet wide x 2.5 feet depth resulting in a capacity of 1370 bbl. With the addition of two oil sales tanks requested in this Application, the berm will be expanded to 180 feet long x 22 feet wide x 2.5 feet depth (**Attachment III.1.E**) resulting in a capacity of 1763 bbl.




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




EXISTING TANK CONFIGURATION

## LEGEND

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



NORTH

NOT TO SCALE

# SITE SCHEMATIC

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: SCHEMATIC A.dwg | PROJECT #: 520.01.01 |
| DRAWN BY: GEI | REVIEWED BY: MRH | ATTACHMENT III.1.C |
| APPROVED BY: IKG | gei@gordonenvironmental.com | |

## Table A-2 (cont'd)
## PIPE WEIGHTS AND DIMENSIONS *(IPS)*
## PE3608 *(BLACK)*

| OD | | | SDR | Nominal ID | | Minimum Wall | | Weight | |
|---|---|---|---|---|---|---|---|---|---|
| Nominal | Actual | | | | | | | lb. per | kg. per |
| in. | in. | mm. | | in. | mm. | in. | mm. | foot | meter |
| | | | 7 | 2.44 | 61.98 | 0.500 | 12.70 | 2.047 | 3.047 |
| | | | 7.3 | 2.48 | 63.08 | 0.479 | 12.18 | 1.978 | 2.943 |
| | | | 9 | 2.68 | 67.96 | 0.389 | 9.88 | 1.656 | 2.464 |
| | | | 9.3 | 2.70 | 68.63 | 0.376 | 9.56 | 1.609 | 2.395 |
| | | | 11 | 2.83 | 71.77 | 0.318 | 8.08 | 1.387 | 2.065 |
| 3 | 3.500 | 88.90 | 11.5 | 2.85 | 72.51 | 0.304 | 7.73 | 1.333 | 1.984 |
| | | | 13.5 | 2.95 | 74.94 | 0.259 | 6.59 | 1.153 | 1.716 |
| | | | 15.5 | 3.02 | 76.74 | 0.226 | 5.74 | 1.015 | 1.511 |
| | | | 17 | 3.06 | 77.81 | 0.206 | 5.23 | 0.932 | 1.386 |
| | | | 21 | 3.15 | 79.93 | 0.167 | 4.23 | 0.764 | 1.136 |
| | | | 26 | 3.21 | 81.65 | 0.135 | 3.42 | 0.623 | 0.927 |
| | | | 7 | 3.14 | 79.68 | 0.643 | 16.33 | 3.384 | 5.037 |
| | | | 7.3 | 3.19 | 81.11 | 0.616 | 15.66 | 3.269 | 4.865 |
| | | | 9 | 3.44 | 87.38 | 0.500 | 12.70 | 2.737 | 4.073 |
| | | | 9.3 | 3.47 | 88.24 | 0.484 | 12.29 | 2.660 | 3.958 |
| | | | 11 | 3.63 | 92.27 | 0.409 | 10.39 | 2.294 | 3.413 |
| 4 | 4.500 | 114.30 | 11.5 | 3.67 | 93.23 | 0.391 | 9.94 | 2.204 | 3.280 |
| | | | 13.5 | 3.79 | 96.35 | 0.333 | 8.47 | 1.906 | 2.836 |
| | | | 15.5 | 3.88 | 98.67 | 0.290 | 7.37 | 1.678 | 2.497 |
| | | | 17 | 3.94 | 100.05 | 0.265 | 6.72 | 1.540 | 2.292 |
| | | | 21 | 4.05 | 102.76 | 0.214 | 5.44 | 1.262 | 1.879 |
| | | | 26 | 4.13 | 104.98 | 0.173 | 4.40 | 1.030 | 1.533 |
| | | | 32.5 | 4.21 | 106.84 | 0.138 | 3.52 | 0.831 | 1.237 |
| | | | 7 | 3.88 | 98.51 | 0.795 | 20.19 | 5.172 | 7.697 |
| | | | 7.3 | 3.95 | 100.27 | 0.762 | 19.36 | 4.996 | 7.435 |
| | | | 9 | 4.25 | 108.02 | 0.618 | 15.70 | 4.182 | 6.224 |
| | | | 9.3 | 4.29 | 109.09 | 0.598 | 15.19 | 4.065 | 6.049 |
| | | | 11 | 4.49 | 114.07 | 0.506 | 12.85 | 3.505 | 5.216 |
| 5 | 5.563 | 141.30 | 11.5 | 4.54 | 115.25 | 0.484 | 12.29 | 3.368 | 5.012 |
| | | | 13.5 | 4.69 | 119.11 | 0.412 | 10.47 | 2.912 | 4.334 |
| | | | 15.5 | 4.80 | 121.97 | 0.359 | 9.12 | 2.564 | 3.816 |
| | | | 17 | 4.87 | 123.68 | 0.327 | 8.31 | 2.353 | 3.502 |
| | | | 21 | 5.00 | 127.04 | 0.265 | 6.73 | 1.929 | 2.871 |
| | | | 26 | 5.11 | 129.78 | 0.214 | 5.43 | 1.574 | 2.343 |
| | | | 32.5 | 5.20 | 132.08 | 0.171 | 4.35 | 1.270 | 1.890 |
| | | | 7 | 4.62 | 117.31 | 0.946 | 24.04 | 7.336 | 10.917 |
| | | | 7.3 | 4.70 | 119.41 | 0.908 | 23.05 | 7.086 | 10.545 |
| | | | 9 | 5.06 | 128.64 | 0.736 | 18.70 | 5.932 | 8.827 |
| | | | 9.3 | 5.11 | 129.92 | 0.712 | 18.09 | 5.765 | 8.579 |
| | | | 11 | 5.35 | 135.84 | 0.602 | 15.30 | 4.971 | 7.398 |
| 6 | 6.625 | 168.28 | 11.5 | 5.40 | 137.25 | 0.576 | 14.63 | 4.777 | 7.109 |
| | | | 13.5 | 5.58 | 141.85 | 0.491 | 12.46 | 4.130 | 6.147 |
| | | | 15.5 | 5.72 | 145.26 | 0.427 | 10.86 | 3.637 | 5.413 |
| | | | 17 | 5.80 | 147.29 | 0.390 | 9.90 | 3.338 | 4.967 |
| | | | 21 | 5.96 | 151.29 | 0.315 | 8.01 | 2.736 | 4.072 |
| | | | 26 | 6.08 | 154.55 | 0.255 | 6.47 | 2.233 | 3.322 |
| | | | 32.5 | 6.19 | 157.30 | 0.204 | 5.18 | 1.801 | 2.680 |

*See ASTM D3035, F714 and AWWA C-901/906 for OD and wall thickness tolerances.*
Weights are calculated in accordance with PPI TR-7.

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

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## VOLUME III:
## ENGINEERING DESIGN AND CALCULATIONS

## Section 2 – CQA Plan
## Replacement Pages

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The Contractor/Installer must construct this project in a workmanlike manner, in conformance with the plans and specifications. The purpose of the CQA program is to provide an independent check of compliance with the plans and specifications for the Owner's benefit. The CQA is also required by OCD as means of demonstrating compliance with performance standards, permit conditions, and applicable regulations.

## C. Documentation

1. Data will be gathered or developed in accordance with procedures appropriate for the intended use of the data and will be of significant or greater quality to stand up to scientific and regulatory scrutiny.
2. Data will be of known or acceptable precision, accuracy, representatives, completeness, and comparability within the limits of the project.

The quality of the measurement data can be defined in terms of the following elements:

1. Completeness - the adequacy in quantity of valid measurements to reduce the potential for misinterpretation.
2. Representativeness - the extent to which discrete measurements accurately describe the greater picture of which they are intended to represent. Good representativeness is achieved through careful, informed selection of sampling site.
3. Accuracy and Precision - the agreement between a measurement and the true value and the degree of variability in this agreement, respectively. Accuracy and precision of data collected in the investigation will depend upon the measurement standards used and the competent use of them by qualified personnel.
4. Comparability - the extent to which comparisons among different measurements of the same quantity or quality will yield valid conclusions. Comparability among measurements will be achieved through the use of standard procedures and standard field data sheets.
5. Traceability - the extent to which data can be substantiated by hard-copy documentation. Traceability documentation exists in two essential forms: that which links quantitation to authoritative standards, and that which explicitly describes the history of each sample from collection to analysis.

The fundamental mechanisms that will be employed to achieve these quality goals can be categorized as prevention, assessment and correction, as follows:

1. Prevention of defects in the quality through planning and design, documented instructions and procedures, and careful selection and training of skilled, qualified personnel;
2. Quality assessment through a program of regular audits and inspections to supplement continual informal review;
3. Permanent correction of conditions adverse to quality through a closed-loop corrective action system.

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# OCD Permit # NM-01-0005

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## VOLUME I:
## PERMIT APPLICATION TEXT

## Replacement Pages

**(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*** *describes best management practices 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).*

**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 19.1521.7 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**

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# OCD Permit # NM-01-0005

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## VOLUME II:
## FACILITY MANAGEMENT PLANS

## Section 1 – Operations, Inspection and Maintenance Plan
## Replacement Pages

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

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

## TABLE OF CONTENTS



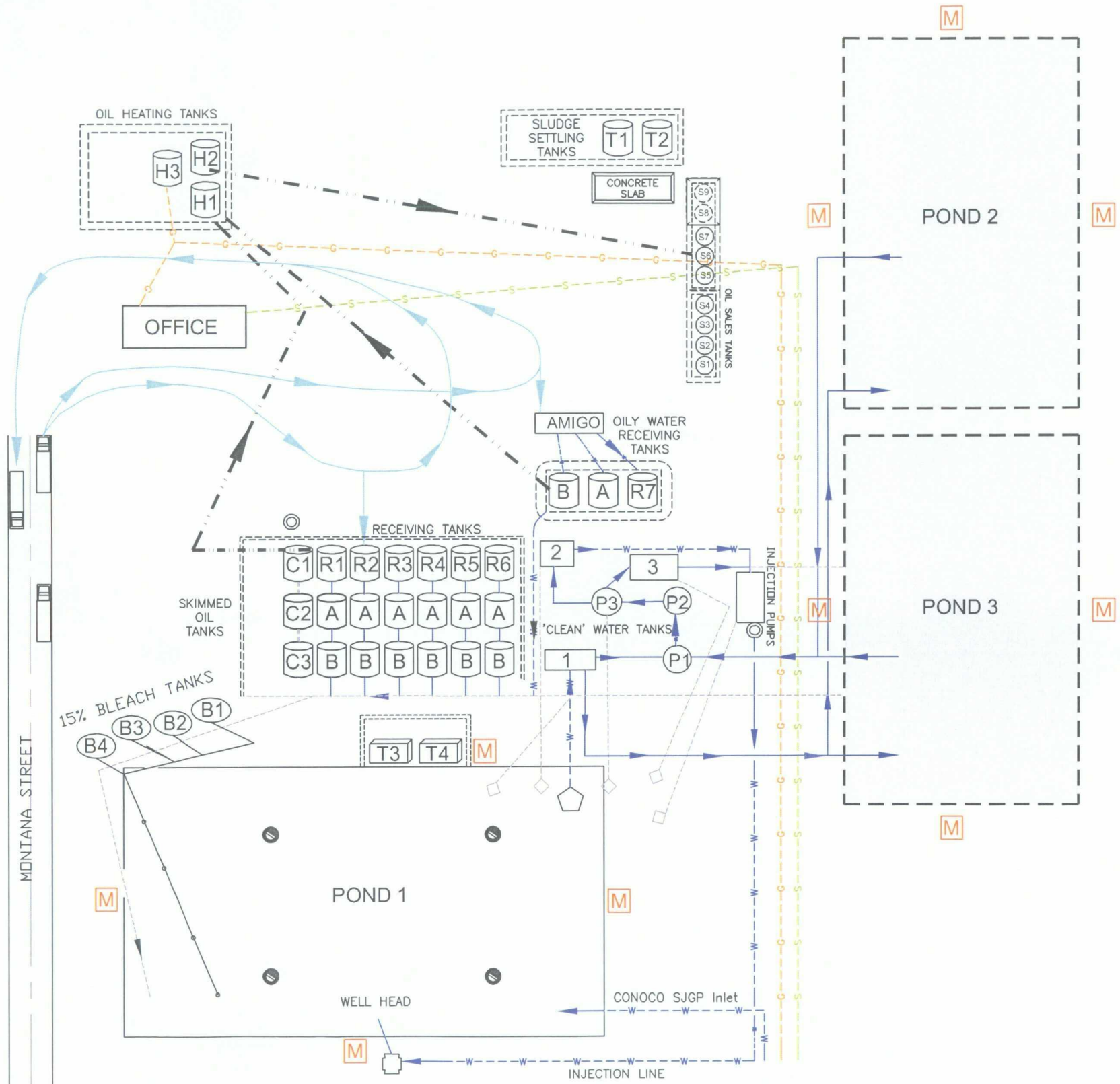
## LIST OF FIGURES



## LIST OF TABLES



## LIST OF ATTACHMENTS




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

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: 06/05/09 | CAD: PROCESS FIGS.dwg | PROJECT #: 520.01.01 |
| DRAWN BY: JFP | REVIEWED BY: MRH | FIGURE II.1.3 |
| APPROVED BY: IKG | gei@gordonenvironmental.com | |

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 2255 gallons using a porosity of 0.65 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 138 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 138 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**).

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 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.

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## VOLUME II:
## FACILITY MANAGEMENT PLANS

## Section 3 – H2S Prevention and Contingency Plan
## Replacement Pages

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 desired 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].

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## VOLUME II:
## FACILITY MANAGEMENT PLANS

## Section 4 – C/PC Plan
## Replacement Pages

## 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

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

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# OCD Permit # NM-01-0005



## VOLUME III:
## ENGINEERING DESIGN AND CALCULATIONS

## Section 1 – Engineering Design
## Replacement Pages

The fluids collected in the leak detection sumps will be monitored and collected by sidewall riser pipes that do not penetrate the secondary liner in compliance with §19.15.36.17.B.(9). The piping is demonstrated to resist degradation by the waste constituents as documented in **Volume III, Section 3**.

Piping will consist of min. 4" diameter SDR 11 HDPE; and will be perforated or slotted for the bottom 2' depth within the sump (i.e., 6' length at 3:1 slope). HDPE piping has shown superior characteristics for waste containment applications vs. the SCH 80 PVC specified in the OCD standards; and has a greater wall thickness as shown on **Table III.1.2**.

**Table III.1.2**
**Comparison of PVC and HDPE Pipe**

| | **4" Diameter Leak Detection Riser Pipes** | |
|---|---|---|
| **Characteristic** | **Schedule 80** | **SDR 11 HDPE** |
| Dimension Ratio | 13.4 | 11.0 |
| Method of Joining | Gasketed | Welded |
| Manning's Number (n) | 0.009 | 0.010 |
| Outside Diameter (in) | 4.500 | 4.500 |
| Min. Wall Thickness (in) | 0.337 | 0.409 |
| Tensile Strength (psi) | 5,000 | 5,000 |
| Modulus of Elasticity (psi) | 400,000 | 130,000 |
| Flexural Strength (psi) | 14,450 | 135,000 |

The details in the Permit Plans (**Sheet 7, Details 1, 2, 3, 5** and **6**) have been updated to reflect the deployment of SDR 11 HDPE piping for the leak detection sump riser pipes.

HDPE or geonet layers will be placed beneath the beveled edge of the perforated riser in the sump profile to a minimum thickness of 200 mil to prevent potential liner damage (**Permit Plan Sheet 7**). Solid HDPE piping will extend from the riser pipe above the sumps to the permanent wellheads shown on **Permit Plan Sheet 7**. Clean select sand will be placed in the sidewall riser trench between the primary and secondary liners to provide structural stability of the solid riser pipe system and support for the primary liner (**Permit Plan Sheet 7**).

OCD upon completion of construction.

## 6.0 POND OPERATION

Detailed plans for the operation of Ponds 2 and 3 are prescribed in **Volume II, Section 1**, "Operations, Maintenance, and Inspection Plan". Essentially, it is anticipated that some fluids will accumulate in the leak detection sumps as a result of condensation, construction water, etc. As described in **Volume II, Section 1**, the leak detection sumps will be monitored at least monthly for the presence of fluids, which may be extracted and tested when the level in the sump(s) exceeds 24". The design of Ponds 2 and 3 allows for isolation of potential leaks into 4 drainage basins, facilitating necessary evaluation or repair.

## 7.0 TANK SECONDARY CONTAINMENT

As proposed in this Application, two (2) additional oil sales tanks and six (6) receiving tanks will be installed. Detailed operations of the tanks are prescribed in **Volume II, Section 1,** "Operations, Maintenance, and Inspection Plan". The new tanks will be constructed with underlying continuous 30-mil polyester bermed liner systems, extended from the existing system and designed to capture any fluids within the watershed of Pond 1 (**Attachment III.1.C**).

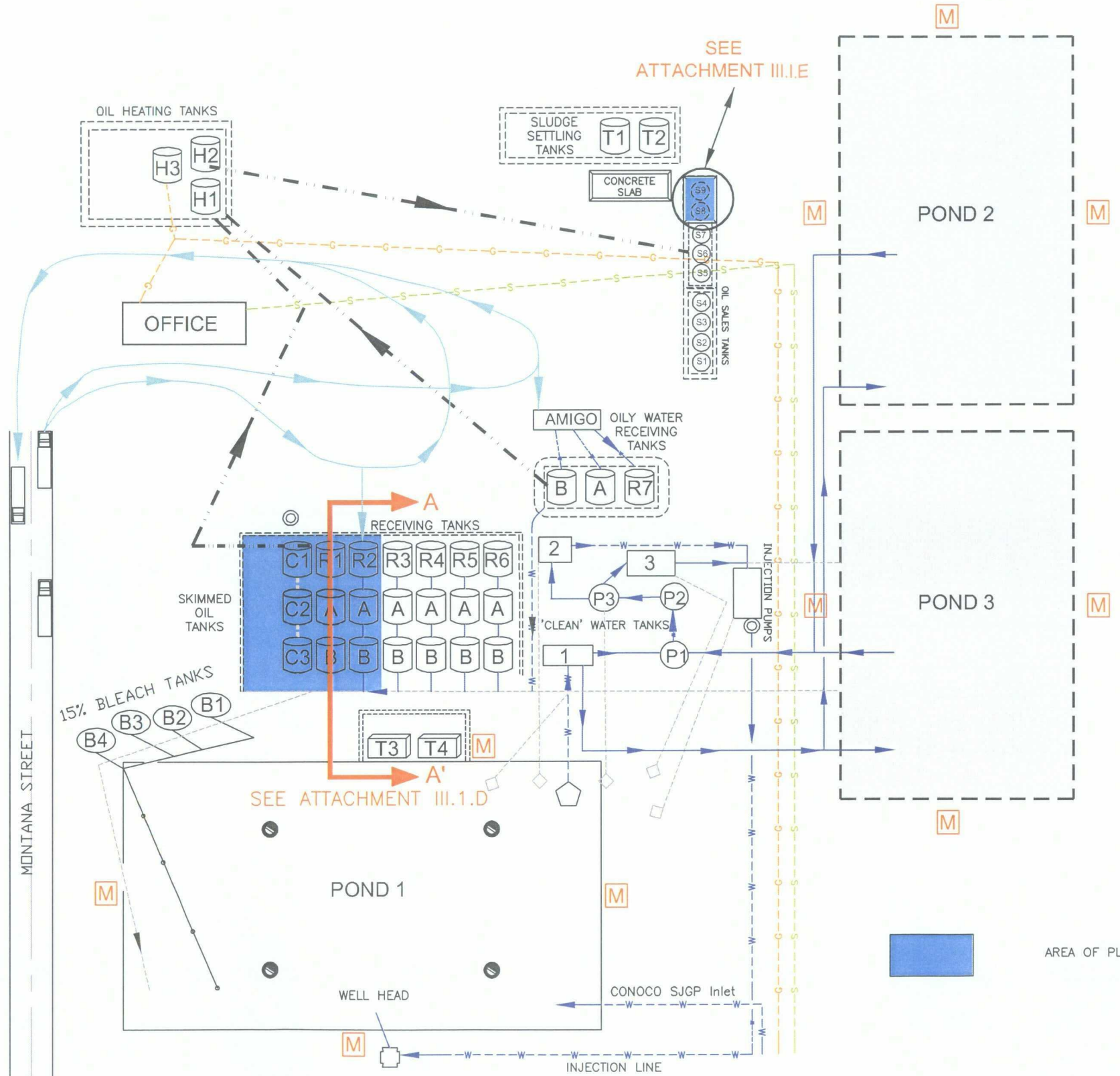
The current secondary containment liner in the tank area is a 30-mil polyester liner (XR-5 8130 Reinforced Geomembrane). In the extension of the secondary containment within the tank area, a 30-mil polyester liner has been specified to allow welding between compatible materials (i.e., between the existing liner and the additional liner). The use of the XR-5 8130 Reinforced Geomembrane in the tank area is primarily based on the chemical compatibility and puncture resistance of the material compared to either PVC or HDPE material. The chemical resistance of the XR-5 material exceeds the chemical compatibility of either PVC or HDPE to hydrocarbon products (see Chemical Resistance Chart, Page 13, "Technical Data and Specifications for XR Geomembranes", **Attachment III.1.H**). Since PVC material has marginal chemical resistance in a hydrocarbon environment, physical properties of the XR-5 geomembrane (**Attachment III.1.H**) are compared to 60-mil HDPE geomembrane (**Attachment III.1.I**) as shown in **Table III.1.3**:

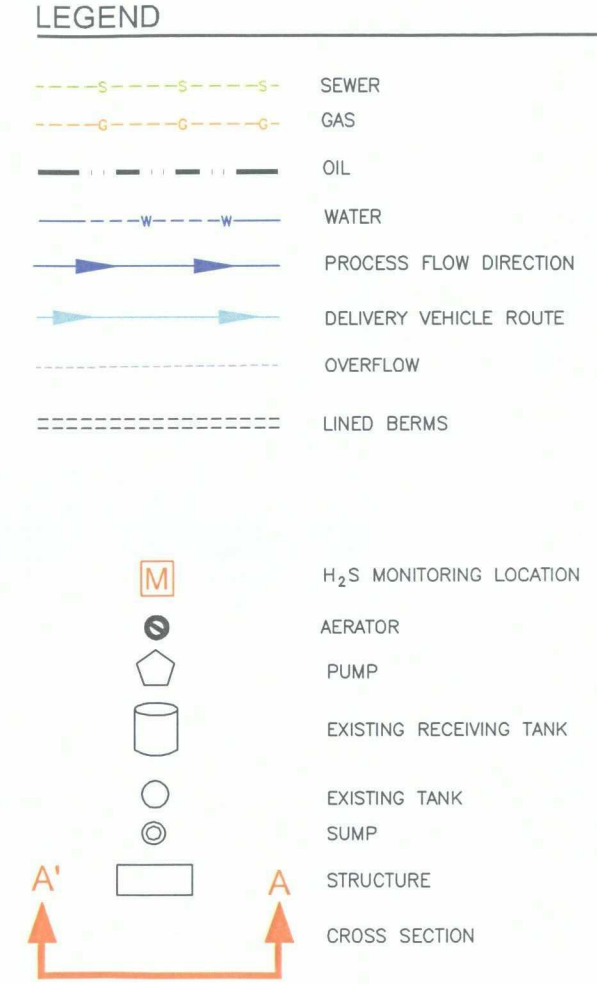
**Table III.1.3**
**Physical Properties**
**XR-5 8130 Reinforced Geomembrane and 60-mil HDPE Geomembrane**

| PROPERTY | XR-5 8130 | 60-MIL HDPE |
|---|---|---|
| THICKNESS | 30-MIL | 60-MIL |
| TEAR STRENGTH | 40 LBS | 42 LBS |
| PUNCTURE RESISTANCE | 275 LBS | 108 LBS |
| BREAK STRENGTH | 400 LBS/IN | 228 LBS/IN |
| BREAK ELONGATION | 25% | 700% |
| HYDROSTATIC RESISTANCE | 800 PSI | > 450 PSI |
| HYDRAULIC CONDUCTIVITY | $1 \times 10^{-12}$ CM/SEC | $2 \times 10^{-13}$ CM/SEC |
| SEAM PROPERTIES | | |
| SHEAR STRENGTH | 500 LBS | 120 LBS/IN |
| PEEL STRENGTH | 40 LBS/2 IN | 91 LBS/IN |

The necessary storage capacity for the interconnected tank/containment system is sufficiently managed by the existing lined volume of Pond 1. In the unlikely event of a total catastrophic failure of all affected storage units, the contents of the tanks will flow into Pond 1, which has a lined storage capacity of 100,000 ± bbl (excluding freeboard). When the freeboard is included, the storage capacity of Pond 1 is over 135,000 bbl, which results in a net surplus of over 25,000 bbl. The entire volume of the receiving tanks, after installation of the six additional tank's surplus will be 8900 bbl, such that the net excess capacity is over 16,000 bbls. Thus, **Pond 1 will hold the entire volume of the receiving tanks within the required permanent freeboard of 3'.**

**Attachment III.1.D** provides details for the containment area construction planned for completion prior to installing the additional six receiving tanks into operation. The seven (7) 440 bbl existing oil sales tanks are currently surrounded by a 30 mil polyester lined bermed area with dimensions of 140 feet long x 22 feet wide x 2.5 feet depth resulting in a capacity of 1370 bbl. With the addition of two oil sales tanks requested in this Application, the berm will be expanded to 180 feet long x 22 feet wide x 2.5 feet depth (**Attachment III.1.E**) resulting in a capacity of 1763 bbl.




AREA OF PLANNED IMPROVEMENTS

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

NORTH

NOT TO SCALE

# SITE SCHEMATIC

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: 05/05/09 | CAD: SCHEMATIC A.dwg | PROJECT #: 520.01.01 |
| DRAWN BY: JFP | REVIEWED BY: MRH | ATTACHMENT III.I C |
| APPROVED BY: IKG | gei@gordonenvironmental.com | |

PIPE INFORMATION: minimum wall, inches
weight per foot pounds
nominal I.D., inches

| O.D., inches nominal | actual | 7 | 7.3 | 9 | 9.3 | 11 | 11.5 | 13.5 | 15.5 | 17 | 21 | 26 | 32.5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.120 | 0.115 | 0.093 | 0.090 | 0.076 | 0.073 | | | | | | |
| 1/2 | 0.840 | 0.12 | 0.11 | 0.09 | 0.09 | 0.08 | 0.08 | | | | | | |
| | | 0.590 | 0.601 | 0.646 | 0.652 | 0.681 | 0.688 | | | | | | |
| | | 0.150 | 0.144 | 0.117 | 0.113 | 0.095 | 0.091 | | | | | | |
| 3/4 | 1.050 | 0.18 | 0.18 | 0.15 | 0.14 | 0.12 | 0.12 | | | | | | |
| | | 0.738 | 0.751 | 0.807 | 0.815 | 0.851 | 0.860 | | | | | | |
| | | 0.188 | 0.180 | 0.146 | 0.141 | 0.120 | 0.114 | | | | | | |
| 1 | 1.315 | 0.29 | 0.28 | 0.23 | 0.22 | 0.19 | 0.19 | | | | | | |
| | | 0.924 | 0.940 | 1.011 | 1.021 | 1.066 | 1.077 | | | | | | |
| | | 0.237 | 0.227 | 0.184 | 0.178 | 0.151 | 0.144 | 0.123 | | | | | |
| 1 1/4 | 1.660 | 0.46 | 0.44 | 0.37 | 0.36 | 0.31 | 0.30 | 0.26 | | | | | |
| | | 1.167 | 1.187 | 1.276 | 1.289 | 1.346 | 1.360 | 1.404 | | | | | |
| | | 0.271 | 0.260 | 0.211 | 0.204 | 0.173 | 0.165 | 0.141 | 0.123 | | | | |
| 1 1/2 | 1.900 | 0.60 | 0.58 | 0.48 | 0.47 | 0.40 | 0.39 | 0.33 | 0.29 | | | | |
| | | 1.335 | 1.359 | 1.461 | 1.475 | 1.541 | 1.556 | 1.607 | 1.645 | | | | |
| | | 0.339 | 0.325 | 0.264 | 0.255 | 0.216 | 0.207 | 0.176 | 0.153 | 0.140 | | | |
| 2 | 2.375 | 0.93 | 0.90 | 0.75 | 0.73 | 0.63 | 0.61 | 0.52 | 0.46 | 0.42 | | | |
| | | 1.669 | 1.698 | 1.826 | 1.844 | 1.926 | 1.945 | 2.009 | 2.056 | 2.084 | | | |
| | | 0.500 | 0.479 | 0.389 | 0.376 | 0.318 | 0.304 | 0.259 | 0.226 | 0.206 | 0.167 | 0.135 | |
| 3 | 3.500 | 2.03 | 1.96 | 1.64 | 1.59 | 1.37 | 1.32 | 1.14 | 1.00 | 0.92 | 0.75 | 0.61 | |
| | | 2.460 | 2.503 | 2.691 | 2.717 | 2.838 | 2.867 | 2.961 | 3.030 | 3.072 | 3.153 | 3.220 | |
| | | 0.643 | 0.616 | 0.500 | 0.484 | 0.409 | 0.391 | 0.333 | 0.290 | 0.265 | 0.214 | 0.173 | 0.138 |
| 4 | 4.500 | 3.35 | 3.24 | 2.71 | 2.63 | 2.26 | 2.17 | 1.88 | 1.65 | 1.52 | 1.24 | 1.01 | 0.82 |
| | | 3.163 | 3.218 | 3.460 | 3.494 | 3.649 | 3.686 | 3.807 | 3.896 | 3.949 | 4.054 | 4.140 | 4.212 |
| | | 0.795 | 0.762 | 0.618 | 0.598 | 0.506 | 0.484 | 0.412 | 0.359 | 0.327 | 0.265 | 0.214 | 0.171 |
| 5 | 5.563 | 5.13 | 4.95 | 4.13 | 4.02 | 3.46 | 3.32 | 2.87 | 2.53 | 2.32 | 1.90 | 1.55 | 1.25 |
| | | 3.910 | 3.978 | 4.277 | 4.319 | 4.511 | 4.557 | 4.706 | 4.816 | 4.882 | 5.012 | 5.118 | 5.207 |
| | | 0.946 | 0.908 | 0.736 | 0.712 | 0.602 | 0.576 | 0.491 | 0.427 | 0.390 | 0.315 | 0.255 | 0.204 |
| 6 | 6.625 | 7.27 | 7.02 | 5.86 | 5.70 | 4.91 | 4.71 | 4.07 | 3.58 | 3.29 | 2.69 | 2.20 | 1.77 |
| | | 4.656 | 4.737 | 5.094 | 5.143 | 5.372 | 5.427 | 5.604 | 5.736 | 5.814 | 5.969 | 6.095 | 6.201 |
| | | 1.232 | 1.182 | 0.958 | 0.927 | 0.784 | 0.750 | 0.639 | 0.556 | 0.507 | 0.411 | 0.332 | 0.265 |
| 8 | 8.625 | 12.32 | 11.90 | 9.94 | 9.66 | 8.32 | 7.99 | 6.90 | 6.07 | 5.57 | 4.56 | 3.72 | 3.00 |
| | | 6.062 | 6.167 | 6.632 | 6.696 | 6.994 | 7.065 | 7.296 | 7.468 | 7.570 | 7.771 | 7.935 | 8.073 |
| | | 1.536 | 1.473 | 1.194 | 1.156 | 0.977 | 0.935 | 0.796 | 0.694 | 0.632 | 0.512 | 0.413 | 0.331 |
| 10 | 10.750 | 19.14 | 18.48 | 15.44 | 15.00 | 12.82 | 12.41 | 10.72 | 9.48 | 8.65 | 7.00 | 5.66 | 4.60 |
| | | 7.556 | 7.687 | 8.266 | 8.346 | 8.717 | 8.806 | 9.094 | 9.307 | 9.435 | 9.685 | 9.890 | 10.062 |

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

RECEIVED
AUG 27 2009
Environmental Bureau
Oil Conservation Division

## VOLUME III:
## ENGINEERING DESIGN AND CALCULATIONS

## Section 2 – CQA Plan
## Replacement Pages

The Contractor/Installer must construct this project in a workmanlike manner, in conformance with the plans and specifications. The purpose of the CQA program is to provide an independent check of compliance with the plans and specifications for the Owner's benefit. The CQA is also required by NMED as means of demonstrating compliance with performance standards, permit conditions, and applicable regulations.

## C. Documentation

1. Data will be gathered or developed in accordance with procedures appropriate for the intended use of the data and will be of significant or greater quality to stand up to scientific and regulatory scrutiny.
2. Data will be of known or acceptable precision, accuracy, representatives, completeness, and comparability within the limits of the project.

The quality of the measurement data can be defined in terms of the following elements:

1. Completeness - the adequacy in quantity of valid measurements to reduce the potential for misinterpretation.
2. Representativeness - the extent to which discrete measurements accurately describe the greater picture of which they are intended to represent. Good representativeness is achieved through careful, informed selection of sampling site.
3. Accuracy and Precision - the agreement between a measurement and the true value and the degree of variability in this agreement, respectively. Accuracy and precision of data collected in the investigation will depend upon the measurement standards used and the competent use of them by qualified personnel.
4. Comparability - the extent to which comparisons among different measurements of the same quantity or quality will yield valid conclusions. Comparability among measurements will be achieved through the use of standard procedures and standard field data sheets.
5. Traceability - the extent to which data can be substantiated by hard-copy documentation. Traceability documentation exists in two essential forms: that which links quantitation to authoritative standards, and that which explicitly describes the history of each sample from collection to analysis.

The fundamental mechanisms that will be employed to achieve these quality goals can be categorized as prevention, assessment and correction, as follows:

1. Prevention of defects in the quality through planning and design, documented instructions and procedures, and careful selection and training of skilled, qualified personnel;
2. Quality assessment through a program of regular audits and inspections to supplement continual informal review;
3. Permanent correction of conditions adverse to quality through a closed-loop corrective action system.

## Hansen, Edward J., EMNRD

**From:** Hansen, Edward J., EMNRD
**Sent:** Wednesday, August 05, 2009 3:28 PM
**To:** 'bdinc@digii.net'
**Cc:** 'Pamela Gonzales'; 'Keith Gordon'; Jordon Eng: Jim Jordon
**Subject:** NM1-5 Additional Information Required for the revised Application for Basin (Ponds #2 & #3)

Dear Dr. Volkerding:

The New Mexico Oil Conservation Division (OCD) has reviewed the revised Application for Modification – Basin Disposal, Inc. (OCD Permit #NM-01-0005) ("Updated June 2009") received on June 11, 2009. Please amend this revised application as follows:

1. On Page 36-11 of Vol. I, please edit to read: "(14)... Volume II, Section 1; Operations, Inspection, and Maintenance Plan ~~describes~~ incorporates a best management practices plan to ensure..."
2. On Page 36-15 of Vol. I, please edit to read: "(4)...pursuant to Paragraph (3) of Subsection F of ~~19.1521.7~~ 19.15.2.7 NMAC..."
3. In the title of the Table of Contents page of Section 1 of Vol. II, please edit to read: "Section 1: OPERATION, INSPECTION AND MAINTENANCE PLAN (INCORPORATING A BEST MANAGEMENT PRACTICES PLAN)"
4. On page 10 of Section 1, Vol. II, please demonstrate or correct the stated porosity of "0.65" for the granular material (e.g., 0.35)
5. On page 11 of Section 1, Vol. II, please edit to read: "Upon discovery of excessive (i.e., >2') liquid presence..."
6. On page 12 of Section 3 (3.2.2), Vol. II, please edit to read: "...to raise the pH to the ~~desired~~ optimal level of 8.2 to 9.0."
7. On page 3 of Section 4 (3.3), Vol. II, please edit to read: "Any other parameters required by the disposal facility or rule at time of closure"
8. On page 7 of Section 1 (7.0), Vol. III, please describe the exact placement for the 6 "new" proposed receiving tanks (e.g., three of the six new tanks will be placed on the east side of the three existing oil skimmer tanks and the other three new tanks will be placed on the west side of the existing oil skimmer tanks)
9. On page "A-8" of Attachment III.1.G (Pipe Wall Thickness Information), Vol. III, please provide a title and reference for this table
10. On page 4 of Section 2, Vol. III, please edit to read: "The CQA is also required by ~~NMED~~ OCD as means of demonstrating compliance..."

Replacement pages may be submitted to the OCD. OCD will then replace the pages for your convenience.

Please contact me if you have any questions regarding this matter.

Edward J. Hansen
Hydrologist
Environmental Bureau
505-476-3489