

R. T. HICKS CONSULTANTS, LTD.

30-025-39593

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May 24, 2010

Mr. Geoffrey Leking
NMOCD District
1625 French Drive
Hobbs, NM 88240
Via E-Mail

Mr. Glenn Von Gonten
NMOCD Environmental Bureau
1220 St. Francis Drive
Santa Fe, New Mexico
Via E-Mail

RECEIVED

JUN 01 2010

HOBSOCD

RE: Lusk 31 Federal #3, Lynx Petroleum Consultants

Dear Geoffrey and Glenn:

On behalf of Lynx Petroleum Consultants., we are requesting three exceptions to NMOCD Rules, unless NMOCD can administratively approve the proposed protocols. This letter confirms our intention to comply with all other prescriptive language in the Rule.

Proposed Alternative Confirmation Sampling Protocol

As discussed in the attachment we request NMOCD review monitoring gypsum block moisture sensor leak detection system in lieu of soil sampling beneath the primary liner as a demonstration that the pit has or has not leaked. For reasons stated in the attachments, we believe this protocol provides better protection of fresh water, public health and the environment than compliance with the prescriptive language of NMOCD Rules. However, we will inspect the earth below the primary liner that is not fully monitored by the leak detection system for moisture and discoloration. We will collect samples of any wet or discolored earth that is not mixed with the drilling waste for burial in the trench.

Proposed Alternative Waste Sampling Protocol

In order to comply with NMOCD Rules that establish concentration limits for trench burial, we propose a protocol that uses "mathematically mixing" of the laboratory results rather than physically mixing clean material with drilling waste. For reasons stated in the attachments, we believe this protocol provides better protection of the fresh water, public health and the environment than compliance with the prescriptive language of NMOCD Rules.

Proposed Use of the Drilling Pit as a Burial Trench

If the drilling pit maintains integrity as expected, the pit closure method will meet the criteria (Part 11.J 1-8) for trench burial. However, the Rule states: "The operator shall use a separate on-site trench for closure of each drying pad associated with a closed-loop system or each temporary pit." We request that NMOCD review the proposal to use a drilling pit with demonstrated integrity in lieu of constructing a separate trench. For reasons stated in the attachments, we believe this protocol provides better protection of fresh water, public health and the environment than compliance with the prescriptive language of NMOCD Rules.

We attach a draft Public Notice that contains a provision for a public meeting immediately after the end of the public notice period. If the Director determines that sufficient interest

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exists to hold a public hearing, this meeting will allow stakeholders to informally address questions and concerns and perhaps avoid the need for a formal hearing. In working with NMED and DairiConcepts in Portales, we have found that these meetings can be less expensive, save time, are very productive and can resolve issues in lieu of a formal hearing. Please take a look at the proposed public notice and tell us what you think.

Finally, this submission is intended to begin a dialogue about how waste and environmental impact may be minimized through the process of an exception in this specific location. We believe the physical attributes of this site lend it to the modifications we have proposed here without undue threat to fresh water, human health and the environment. We look forward to NMOCD input and will be pleased to consider alternatives that are cost-effective and provide a higher degree of environmental protection. We also stand ready to provide answers to any questions of NMOCD and responses to any comments.

Sincerely,
R.T. Hicks Consultants

A handwritten signature in dark ink, appearing to read "Randall Hicks", with a stylized flourish at the end.

Randall Hicks

Copy: Lynx Petroleum Consultants
Bureau of Land Management

DRAFT NOTICE OF PUBLICATION

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

Notice is hereby given that pursuant to Oil Conservation Division Regulations, the following Proposed Exceptions to NMOCD Rules have been submitted to the Director of the Oil Conservation Division, 1220 S. St. Francis Dr., Santa Fe, New Mexico 87505, Telephone (505) 476-3440:

Larry Scott, President of Lynx Petroleum Consultants, Inc., which is a New Mexico corporation, Telephone (575) 392-6950, PO Box 1708, Hobbs, New Mexico 88241, has submitted an application for exceptions to NMOCD Rules for the Lusk 31 Federal #3 Drilling Pit site, located in Section 31, Township 18 South, Range 32 East, Lea County, New Mexico, approximately 12 miles south of Maljamar, New Mexico. Lynx Petroleum Consultants, Inc. is the operator of an oil and gas well at the site.

With the exception of the proposals described below, the operator will follow all mandates of NMOCD Rules. Proposal #1: In lieu of collecting soil samples beneath the liner to determine if a release occurred, the operator proposes to monitor a leak detection system. Proposal #2: In lieu of physically mixing one part drilling waste with three parts "clean soil" prior to sampling, the operator proposes to remove entrained brine from the waste to stabilize the material, obtain a sample of the undiluted waste and "mathematically mix" the sample results to demonstrate that the mass of constituents of concern in the waste meets the criteria of NMOCD Rules. Proposal #3: Because an intact drilling pit meets the construction specifications for a burial trench, the operator proposes to use the drilling pit for trench burial of the waste.

The division has determined that the application satisfies the requirements of OCD Rules and is therefore, administratively complete. The division will accept written comments on the proposed exceptions if the director receives them within 30 days after the date of publication of the public notice. Persons who are interested in obtaining further information, submitting comments, or wish to be placed on a facility-specific mailing list for future notices may contact the Environmental Bureau Chief of the Oil Conservation Division at the address given above. The application and administrative completeness determination may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday, or may also be viewed at the OCD web site (<http://www.emnrd.state.nm.us/ocd>). Persons who are interested in obtaining a copy of the application and administrative completeness determination may contact XXXXX at the address given above, or by telephone at 505-476-3484, or by email at XXXXXX..

The Director shall allow a period of at least thirty (30) days after the date of publication of this notice, during which interested persons may submit comments or request that NMOCD hold a public hearing. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines that there is significant public interest.

If the Director determines that a hearing is required, the operator has agreed to hold a public meeting at 6 pm on June (this date will be after the public notice period) at the Hobbs Country Club in Hobbs, New Mexico to address questions or concerns.

Siting Criteria

NMOCD approved in place burial of drilling waste at this site. Our review of the data confirms that the site also meets the siting criteria for trench burial.

Amended Design Plan

Figures 1 through 3 present the design plan for the proposed drilling pit and leak detection system. In addition to the specifications outlined in 19.15.17.11 NMAC, the construction contractors will follow the steps outlined below:

- I. Topsoil from the pit and pad site are segregated for restoration of the pit and site after operations cease.
- II. If practical, the contractor will separate coarser material from finer-grained material excavated from the pit for use in constructing the infiltration barrier over the buried waste when operations of the drilling pit cease.
- III. The proposed depth of the pit is sufficient to cause cuttings and residual drilling fluid solids to be at least 4-feet below the final ground surface after drilling ceases and free liquid has been removed from the pit.
- IV. Below the liner, the contractor will install the leak detection system described in the Confirmation Sampling Plan.
- V. Above the liner, a drain system composed of perforated pipe will allow removal of brine and associated constituents of concern from the residual solid materials.
- VI. Two-foot tall berms surround the pit providing ample freeboard.
- VII. The side slopes proposed for the pit are 1.5H:2V and the end slopes are 2H:1V.
- VIII. The factory welded liner will be installed in conformance with manufacturer's specification and consistent with NMOCD Rules.

We request administrative approval from the District Office for the proposed 1.5H:1V side slopes for the pit.

Operations Plan

In addition to the specifications outlined in 19.15.17.12 NMAC, Lynx shall:

1. Use steel pit and lined outer horse shoe reserve pit to circulate mud and drill surface casing with fresh water.
2. Use steel pit and lined inner horse shoe reserve pit to circulate mud and drill intermediate casing with saturated brine.
3. Transfer sufficient brine fluid from inner pit to outer horse shoe pit to create appropriate salinity/weight of drilling fluid for drilling to total depth.
4. Use steel pit and lined outer horse shoe reserve pit to circulate mud and drill to total depth with cut brine.
5. When possible, add fresh water to inner pit to create brine/cut brine and transfer fluid to outer pit as necessary to accommodate for fluid loss during drilling.
6. During drilling the liner leak detection system is checked daily and weekly during drying and closure.

7. After drilling is complete, clear fluid is removed by vacuum trucks from the pits and/or drainage system pumping. Recovered clear cut brine might be re-used as make up water for the next well (some salt addition may be required) or sent to disposal.
8. After 10-20 days of drainage pumping and solids drying, the solids will be sampled as described below.

Solids Sampling Plan

The contents of the pit will be sampled prior to any necessary stabilization according to the protocol outlined in NMOCD Rules for trench burial. We will obtain a five-point composite sample of the residual solids for laboratory analysis of:

- GRO and DRO using EPA Method 8015B rather than TPH concentration, as determined by EPA method 418.1
- Chloride, using EPA SW-846 method 1312 (SPLP) and determined by EPA method 300.1
- The concentrations of the inorganic water contaminants specified in Subsection A of 20.6.2.3103 NMAC EPA SW-846 method 1312 (SPLP) as determined by appropriate EPA methods, and
- The concentrations of the organic water contaminants specified in Subsection A of 20.6.2.3103 NMAC EPA SW-846 method 1312 (SPLP) as determined by appropriate EPA methods.

The NMOCD Rule 13.F.3.c specifies concentration limits for the residual mud and cuttings for trench burial. However, the Rule states that residual mud and cuttings may be mixed with three parts clean earth prior to sampling. As NMOCD understands, adding clean soil to the cuttings and mud provide no environmental benefit for trench burial of waste. For in-place burial, concentration limits are critical to the protection of the root zone. For trench burial, the Laws of Fluid Mechanics demonstrate that it is not the concentration that creates any threat to ground water or the root zone – it is the mass of the buried constituent (and to a lesser extent moisture content, grain size, and other factors). This letter formally requests an exception to NMOCD Rules unless NMOCD can administratively approve “mathematically mixing” the laboratory results from the waste sampling protocol rather than wasting clean earth material that can be used for construction of the infiltration barrier. The example below illustrates our proposed arithmetic.

When we physically mix 3 parts earth with a chloride concentration of 10 mg/L (SPLP preparation method) with drilling solids that contain 11,000 mg/L (SPLP preparation method) the resultant concentration is:

$$\text{Cl ppm in mixture} = \frac{(\text{Cl ppm in solids} * 1 \text{ part}) + (\text{Cl ppm in earth} * 3 \text{ parts})}{4 \text{ parts}}$$

Or for this example:

$$\text{Cl ppm in mixture} = \frac{11,000 + 10}{4} = 2,753 \text{ mg/L}$$

Upon receipt of the results, we will provide NMOCD with the calculation showing that the mass of constituents of concern that will be trench buried at the site meets the criteria established by NMOCD Rules. Excavation and removal of the solids in the brine pit (inner horse shoe) may be required to meet the criteria established in NMOCD Rules.

We conclude that this protocol provides equal or better protection of the environment than following the specific text of NMOCD Rules. This protocol is mathematically equal to compliance with the Rule and allows waste minimization.

We also ask for administrative approval to evaluate GRO and DRO rather than TPH as described above.

Confirmation Sampling Plan

NMOCD Rules state "The operator shall test the soils beneath the temporary pit to determine whether a release has occurred." The Rule then provides a protocol for this sampling protocol. This letter formally requests an exception to NMOCD Rules unless NMOCD can administratively approve employing the leak detection system described below in lieu of soil sampling beneath the primary liner as a demonstration that the pit has or has not leaked. However, as described below, we will inspect the earth below the primary liner that is not fully monitored by the leak detection system for moisture and discoloration.

The proposed leak detection system is essentially the same system approved by the New Mexico Environment Department for a brackish water pit in Sandoval County. For the Lusk Pit, a total of 10 leak detection grids are proposed. Each leak detection grid consists of:

- One gypsum block moisture sensor (Soil Moisture Corporation Model 5201F, www.soilmoisture.com/prod_details.asp?prod_id=1087&cat_id=20) installed in accordance with manufacturer's specifications in
- A 6-inch layer of permeable earth (e.g. sand), which overlies
- A sheet of 20-mil string reinforced liner with dimensions of approximately 25 feet by 30 feet

Two leak detection grids will underlie the inner horse shoe brine pit, which will be completely removed to trench burial. Upon pit closure, the earth material beneath the pit will be visually inspected for wet or discolored earth.

Eight leak detection grids will be distributed beneath the outer horse shoe of the pit. As described in the closure plan, the drilling pit will become the burial trench provided that the liner maintains integrity. Therefore, we will inspect the side slopes of pit for wet earth or discoloration during the closure process.

Because the State of New Mexico has approved this system for the Sandoval County temporary pit, we hope that NMOCD will administratively approve this method "to determine if a release has occurred". We conclude that this method of leak detection provides better protection of the environment than compliance with the specific mandates of NMOCD Rules because monitoring the integrity of the pit occurs during and after operation of the pit. Real-time leak detection will allow the operator to take action to mitigate impact to the environment whereas inspection during closure does not.

Closure Plan

The design of the drilling pit is consistent with the design of a trench for burial (see Appendix B). Provided leak detection monitoring demonstrates that the drilling pit liner has maintained integrity and other design features are implemented during closure of the pit, we suggest that burial of waste in a drilling pit is equivalent to burial of waste in a separate trench. However, Section 19.15.17.F.3 of the Rule states: "The operator shall use a separate on-site trench for closure of each drying pad associated with a closed-loop system or each temporary pit." This letter formally requests an exception to NMOCD Rules unless NMOCD can administratively approve using the existing pit in lieu of constructing a separate trench providing that other criteria set forth in this letter are met. We conclude that using a drilling pit with documented liner integrity provides equal or better protection of the environment than following the specific text of NMOCD Rules as required for an exception. Avoiding construction of a separate trench minimizes the environmental footprint of the drilling activity and thus minimizes waste.

The protocol for using the existing pit as a burial trench is:

- A. After drilling is complete, remove all standing fluids from the pit to disposal or storage via vacuum truck or drainage system pumping.
- B. Removal of residual brine and cut brine from the residual solids occurs via the drainage system (two solar pumps discharging about 2-4 GPM operated 24 hours/day)
- C. After 10-20 days of pumping and evaporation of fluids, the residual solids should have a bearing capacity to support the final cover, however the addition of some dry soil may be warranted.
- D. Fold the pit liner over the waste as prescribed in NMOCD Rules. Sew or otherwise amend new liner to the residual pit liner as required to meet the requirement of the Rule..
- E. Place a second liner over the folded liner in conformance with the language of NMOCD rules.
- F. Place the coarser-grained excavated material (if available) over the liner then the finer-grained material such that at least 4-feet separates the top of the encapsulated waste from the final ground surface after restoration.

If the leak detection system identifies a release, we will address the release under Part 29 of the Rules.

Soil Cover, Re-vegetation, Site Reclamation

We will follow the protocols outlined in NMOCD Rules for placement of the soil cover, for re-vegetation and for site reclamation.

Landowner Notification

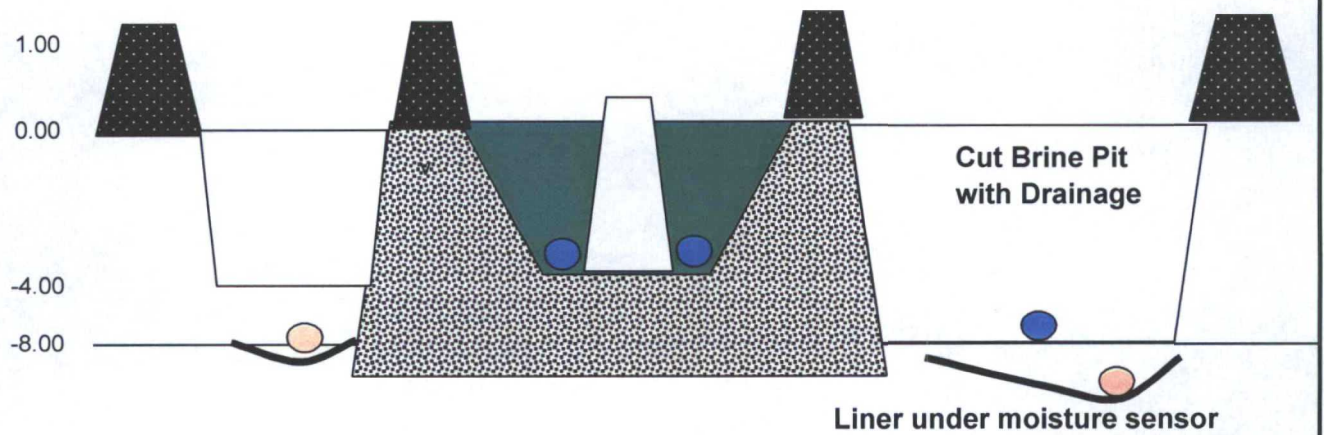
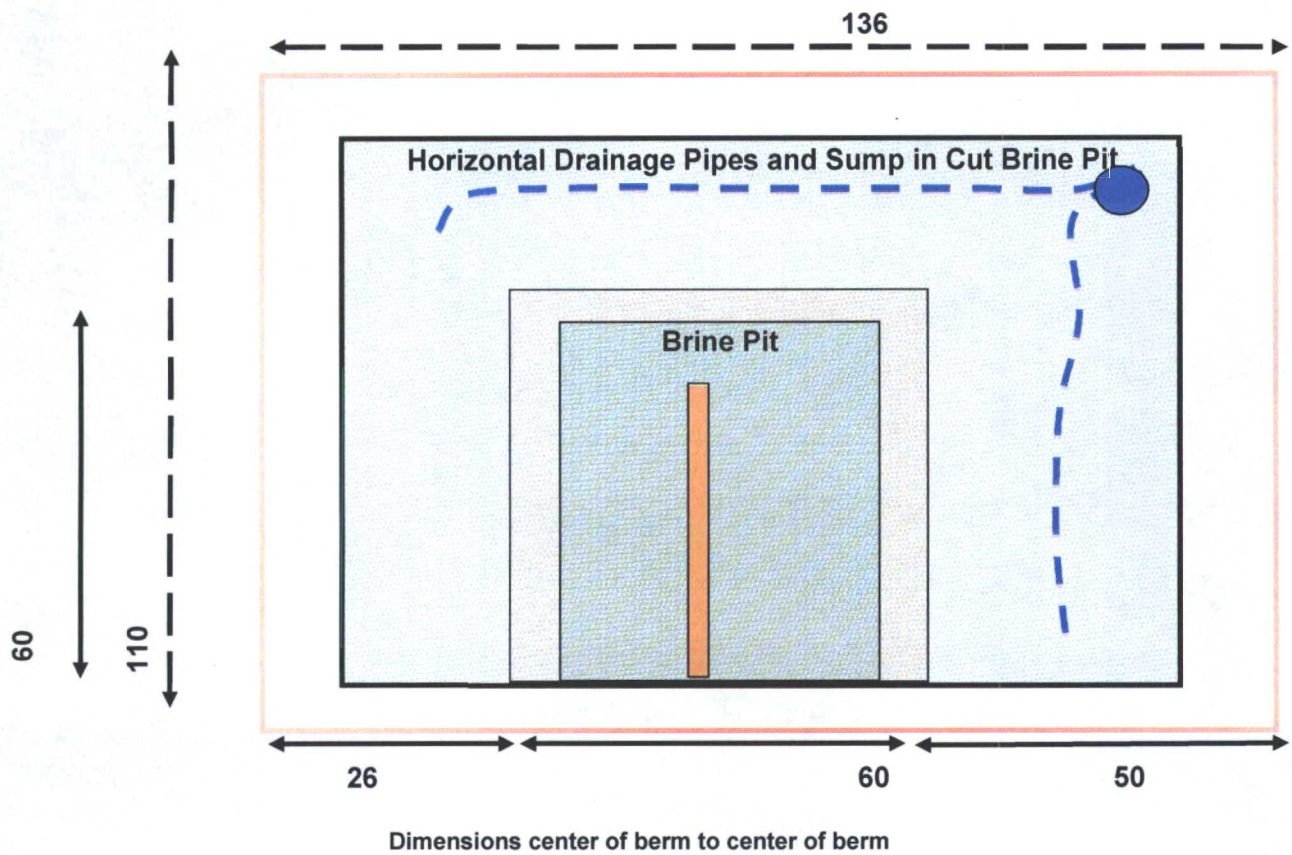
The Federal government is the surface landowner and their representative, the BLM, has approved the APD with the provision for on-site burial of cuttings.

Permanent Marker

Lynx Petroleum Consultants will install a permanent marker per NMOCD Rules to identify the location of the buried cuttings and mud.

Rationale for Administrative Approval or Approval of Exceptions for Identified Protocols

1. We believe the information presented herein demonstrates that the proposed alternative methods provide equal or better protection of fresh water, public health and the environment than following the prescriptive language of NMOCD Rules.
2. The protocols require removal of liquids prior to implementing the closure method and disposal of the liquids in a division-approved facility. If possible, we will recycle or reuse the liquids for drilling future wells.
3. The proposed protocols outlined herein implement one or more of the following practices:
 - a. Waste minimization – the protocols do not call for mixing clean earth with waste
 - b. Reclamation – using the existing drilling pit for the burial trench reduces the size of disturbance of habitat
 - c. Reuse; recycling – the protocols call for re-using the pit and pit liners for the burial trench;
 - d. Reduction in available contaminant concentration – removal of cut brine and entrained constituents of concern from the residual solids via drainage system pumping will reduce the mass/concentration in the buried waste



Patent Pending

Pit Liner Schematics

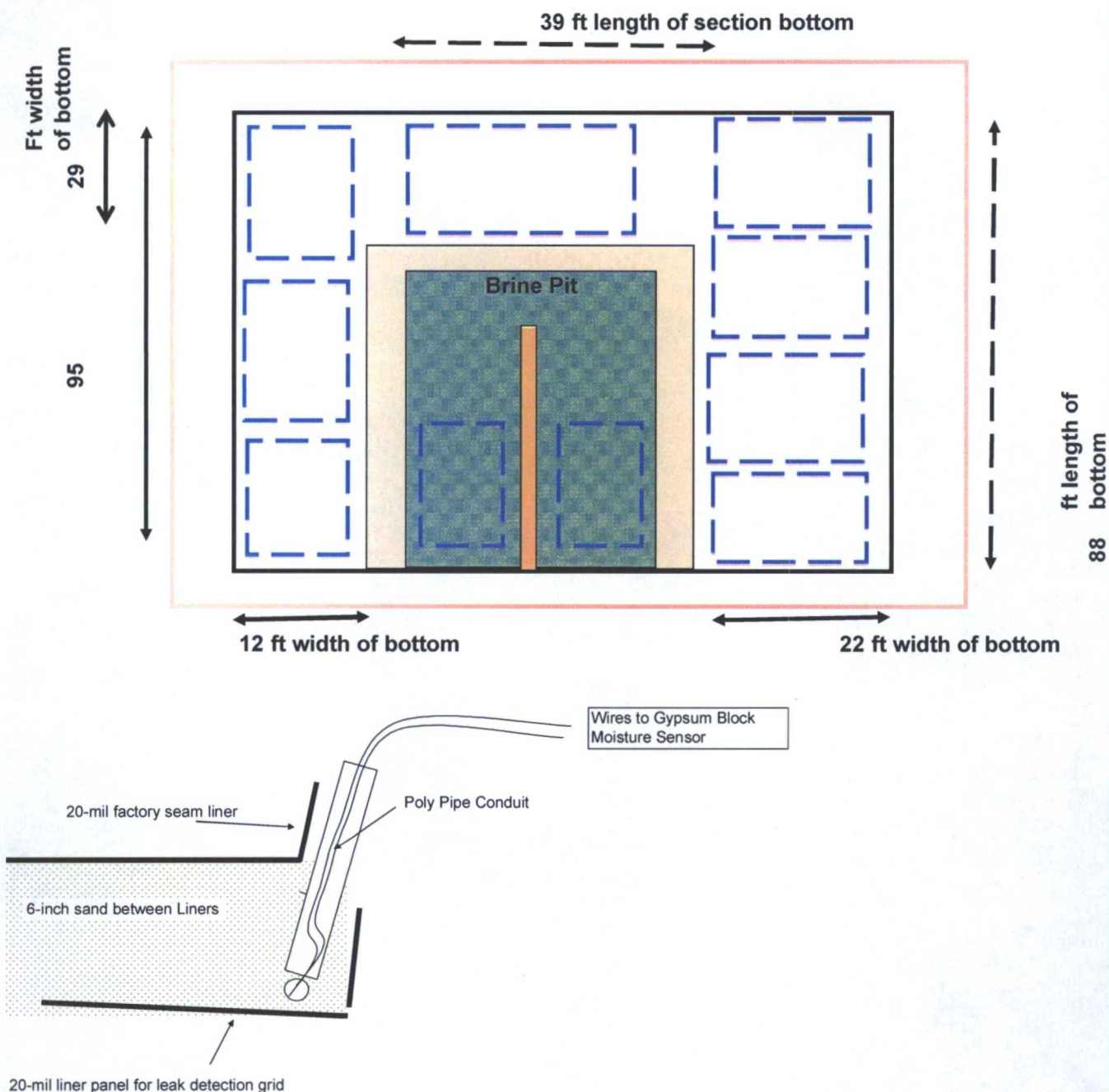
Figure 1

R.T. Hicks Consultants, Ltd.

Lynx Petroleum Consultants - Lusk 31 Fed #3

May-10

Soil Moisture Corporation Gypsum Block Model 5201F placed over 20-mil liner panel (dashed rectangles). Six inches of permeable material (e.g. soil or sand) placed between liner panel and primary pit liner. Poly pipe conduit protects electrical leads from block to surface. Sloped liner panel directs any seepage to moisture sensor



Patent Pending

R.T. Hicks Consultants, Ltd.

Leak Detection System Schematic

Figure 2

Lynx Petroleum Consultants - Lust 31 Fed #3

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