Docket 40-8745

PDR

Return to D. Cramer 396-SS

OGLE PETROLEUM INC.

Telephone (805) 969-5041
Telecopier (805) 969-3278
Telex No. 658-430

P.O. Box 5549
559 San Ysidro Road
Santa Barbara, California 93108

Please direct reply to:

150 North Nichols Avenue
Casper, Wyoming 82601
(307) 266-6456

August 7, 1981

DOCKETED
USNRC
AUG 1 3 1981
NMSS
MAIL SECTION
DOCKET CLERK

RECEIVED
AUG 11 1981
U.S. Nuclear Regulatory Commission
NMSS
Mail Section

Mr. Ross A. Scarano, Chief
Uranium Recovery Licensing Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

RE: Bison Basin Project
Docket No. 40-8745
Source Material Lic. SUA-1396

RECEIVED
AUG 19 1981
U.S. NUCLEAR REGULATORY COMMISSION

SUBJECT: License Condition No. 77
R & D Evaporation Pond

Dear Mr. Scarano:

Ogle Petroleum Inc. (OPI) received a letter from Mr. John J. Linehan dated July 14, 1981 concerning the subject evaporation pond. The letter stated that certain test should be performed to demonstrate the strength of the compacted embankment material.

OPI has performed the required tests and the data from the test are enclosed with this letter. Mr. Dan Gillen from your staff has reviewed the tests results at the Inberg-Miller Engineering Company offices in Riverton, Wyoming and he has personally inspected the condition of the R & D pond embankments during a site visit on August 4, 1981. It is our understanding that Mr. Gillen feels the existing R & D evaporation pond is in satisfactory condition for use during the commercial phase of the Bison Basin project.

Please get in touch with me at our Casper office if you or your staff have questions concerning the enclosed data.

Sincerely,
OGLE PETROLEUM INC.

Glenn J. Catchpole

Glenn J. Catchpole
Vice President and
Uranium Project Manager

RECEIVED
AUG 12 1981
U. S. NUCLEAR REGULATORY COMMISSION
NMSS
Mail Section

Enclosures

cc: Document Management Branch

FEE EXEMPT

10284

add'l info

8108020055 810807
PDR ADOCK 04008745
C PDR

INBERG-MILLER ENGINEERS

124 EAST MAIN STREET RIVERTON, WYOMING 82501 TELEPHONE 307-856-8136

August 7, 1981 M-355-81

RECEIVED
AUG 11 1981
U.S. Nuclear Regulatory Commission
[illegible]

Mr. Glenn Catchpole
Ogle Petroleum, Inc.
150 North Nichols Ave.
Casper, Wyoming 82601

RE: Soil Borings, Reservoir #1 (R&D Pond), Bison Basin Project

Dear Mr. Catchpole:

This letter reports information obtained from soil borings and shallow density tests performed at your request on berms of the existing pond, Reservoir #1, of the Bison Basin Project.

Two borings were advanced at centers of southeast and southwest berms to depths of 17 feet and 12 feet respectively. See Figure 1 and Final Boring Logs 1 and 2. Soils encountered were consistently silty, fine sands (sub-angular to sub-rounded). Standard Penetration Test (ASTM D-1586) blow counts averaged 15 and did not vary appreciably between berm fill and undisturbed sub-soils.

Two in-place density tests (Sand Cone Method, ASTM D-1556) were performed approximately one to two feet deep at centers of southeast and southwest berm crests. Densities were 99.3 pcf and 95.9 pcf respectively. These correspond to 80.6% to 77.8% respectively of Modified Proctor (ASTM D-1557) maximum dry density of the soils of 123.2 pcf.

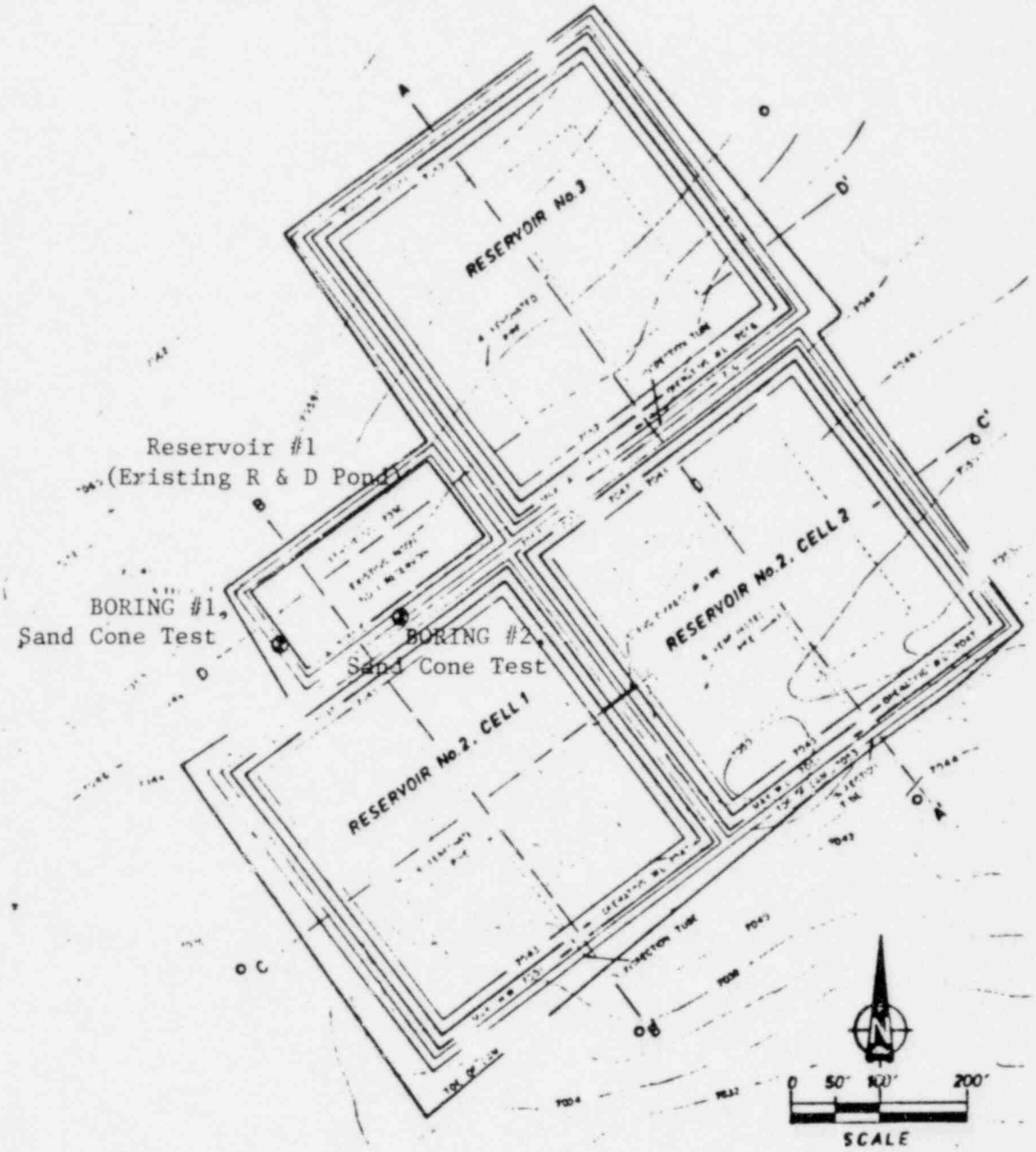
This information was provided to Mr. Dan Gillen during the inspection summary conference at our office the afternoon of August 4, 1981. He explained that no further investigation or strength testing for Reservoir #1 stability evaluation would be required.

Sincerely,
INBERG-MILLER ENGINEERS

Roger G. Miller, E.I.T.
Civil/Geotechnical Engineer

RGM/pjh/10A

FIGURE 1.



SITE PLAN

Bison Basin, OPI-Western
Evaporation Ponds

GENERAL CONDITIONS - DATA COLLECTION

Field-sampling techniques were employed in this investigation to obtain the data presented in the Final Boring Logs, and in the Report, in accordance with ASTM D420, D1452, D1586 (where applicable) and D1587 (where applicable).

The drilling method utilized in borings is a dry-process, machine rotary auger type, which advances hollow threaded steel pipe surrounded by attached steel auger flights in 5 foot lengths. This method creates a continuously cased test hole that prevents the boring from caving in above each level of substrata to be tested. Sampling tools are lowered inside the hollow shaft for testing in the relatively undisturbed soils below the lead auger.

Sampling in cohesionless (granular) soils was accomplished driving a standard split-barrel tool (split-spoon) with a 140 lb weight falling 30 inches. The number of blows required to advance the tool in two-6 inch increments following 6 inches of seating were recorded on the FINAL BORING LOGS under "N" column, referring to the standard penetration test (ASTM D1586).

Sampling in cohesive soils was performed by hydraulically pushing steel sharpened-edge thin walled tube samplers at a uniform rate. Tubes were advanced below the tip of the lead auger at least 30 inches, to retrieve a sample, in accordance with ASTM D1587 The tubes are equipped with pressure-releasing ports to allow water to escape as the tube is advanced.

Samples were brought to the surface, examined by the drilling foreman and sealed in containers (or sealed in the tubes) to prevent loss of moisture. They were returned to our laboratory for final classification per ASTM D2487-69 methods. Some samples were subjected to tests as described in the text of the report.

A field log was prepared for each boring by the drilling foreman during on-site operations in order to record field occurrences, sampling intervals and groundwater observations. The field logs and laboratory test data sheets are available for inspection at the Engineer's office. They are not included in this report because they do not represent the Engineer's final opinions or interpretations.

A final log of each test pit or boring was prepared by the writer of the report or the Engineer's staff. Each final log contains the writer's interpretation of field conditions or changes in substrata between recovered samples based on the field data received along with the laboratory test data obtained following the field work or on subsequent site observations. The final logs were prepared by assembling and analyzing field and laboratory data. Therefore, the final logs contain both factual and interpretive information. Our opinions are based on the final logs, not the field logs.

The final logs list boring methods, sampling methods, depths sampled, amounts of recovery in sampling tools, indications of the presence of subsoil types and groundwater level observations. Results of some laboratory tests are arrayed on the final logs at the appropriate depths below grade. The horizontal lines on the final logs which designate the interface between successive layers represent approximate boundaries. The transition between strata was typically gradual.

We caution that the final boring logs alone do not constitute the report, and as such they should not be excerpted from the other appendix exhibits nor from any of the written text. Without the written report it is possible to misinterpret the meaning of the information reported on the final logs. If the reports are to be reproduced for bidding or reference purposes, the entire numbered report and appendix exhibits should be bound together as a separate document or as a section of a specification booklet, including all maps.

Pocket penetration tests taken in the field or on samples examined in the laboratory are listed on the final boring logs in a column marked "pp". These tests were performed only to indicate relative stiffness in consistency between successive layers of cohesive soil. It is not recommended that the listed values be used to determine allowable bearing capacities. Bearing capacities of soils are determined by the engineer using laboratory testing methods as described in the text of the report.

Groundwater observations were made with cloth-tape measurements in the open drill holes by field personnel at the times and dates stated on the final logs. It must be noted that fluctuations may occur in the groundwater level due to variations in rainfall, seasonal temperature, nearby site improvements, underdrainage, wells, severity of winter frosts, overburden weights and the permeability of the subsoils. Because variations may be expected, fina[illegible]s and construction planning should allow for the need to tempo[illegible]y or permanently dewater excavations or subsoils.

BORING LOG OF TEST HOLE NO. 1

PROJECT Bison Basin Reservoir #1 LOCATION Center SW Berm

SURFACE ELEVATION —— JOB NO. M-355-81 CLIENT OPI-Western

BENCHMARK OR DATUM ——

DEPTH	SAMPLE DEPTH RECOVERY	SOIL DESCRIPTION	SYM.	UNIFIED CLASSIF.	N	P.P.	q_u	LL PL PI	γ_m γ_d w	OTHER LAB. TESTS
FT										
	00	SURFACE								
	SS 12"	Silty fine SAND, occasional gravel		SM	12					
5	SS 12"	Same		SM	14					
	SS 12"	Same		SM	15					
		– – – Approx. Berm/Subgrade Contact								
	SS 11"	Same		SM	14					
10										
	SS 10"	Same		SM	24					
		Terminate Boring								
15										

GROUNDWATER MEASUREMENTS

DEPTH AT COMPL. None FT. CAVE-IN DEPTH 7.2 FT.

AFTER – HRS. – FT. AFTER – HRS. – FT.

AFTER – HRS. – FT. AFTER – HRS. – FT.

DRILLING & SAMPLING NOTES

DATE BEGUN 7/31/81 DATE COMPL. 7/31/81

CREW RCS, DH RIG CME-55

METHOD 8"H.S.A.

10276

MILLER TESTING COMPANY

BORING LOG OF TEST HOLE NO. 2

PROJECT Bison Basin Reservoir #1
LOCATION Center SR Berm
SURFACE ELEVATION ——
JOB NO M-355-81
CLIENT OPI-Western
BENCHMARK OR DATUM ——

DEPTH	SAMPLE DEPTH RECOVERY	SOIL DESCRIPTION	SYM.	UNIFIED CLASSIF.	N	P.P.	q_u	LL PL PI	γ_d / ω	OTHER LAB. TESTS
Ft	00	SURFACE								
	SS 10"	Silty, fine SAND, occasional gravel		SM	10					
5	SS 11"	Same		SM	14					
	SS 13"	Same		SM	14					
	SS 12"	– – – Approx. Berm/Subgrade Contact Same		SM	16					
10										
	SS 12"	Same		SM	8					
15	SS 10"	Same		SM	17					
	SS 12"	Same Terminate Boring		SM	20					
20										

GROUNDWATER MEASUREMENTS

DEPTH AT COMPL. None FT. CAVE-IN DEPTH 10.7 FT.
AFTER – HRS. – FT. AFTER – HRS – FT.
AFTER – HRS. – FT. AFTER – HRS – FT.

DRILLING & SAMPLING NOTES

DATE BEGUN 7/31/81 DATE COMPL. 7/31/81
CREW RCS, DH RIG CME-55
METHOD 8" HSA

10276

MILLER TESTING COMPANY

BORING LOG SYMBOLS

GROUP SYMBOLS	DESCRIPTION	GROUP SYMBOLS	DESCRIPTION
░ GW or GP	SANDY GRAVEL	▥ MH	INORGANIC SILT
░ GM	SILTY GRAVEL	▨ CH	INORGANIC CLAY
░ GC	CLAYEY GRAVEL	▨ OH	ORGANIC CLAY
░ SW or SP	SAND	░ Pt	HIGHLY ORGANIC SOIL
░ SM	SILTY SAND	▤ GM-GC	SILTY CLAYEY GRAVEL
░ SC	CLAYEY SAND	▤ SM-SC	SILTY CLAYEY SAND
▥ ML	INORGANIC SILT	▤ CL-ML	SANDY SILTY CLAY
▨ CL	INORGANIC CLAY	▤	DEBRIS & RUBBLE FILL
▥ OL	ORGANIC SILT	▩	AUGER REFUSAL

10276

NOMENCLATURE

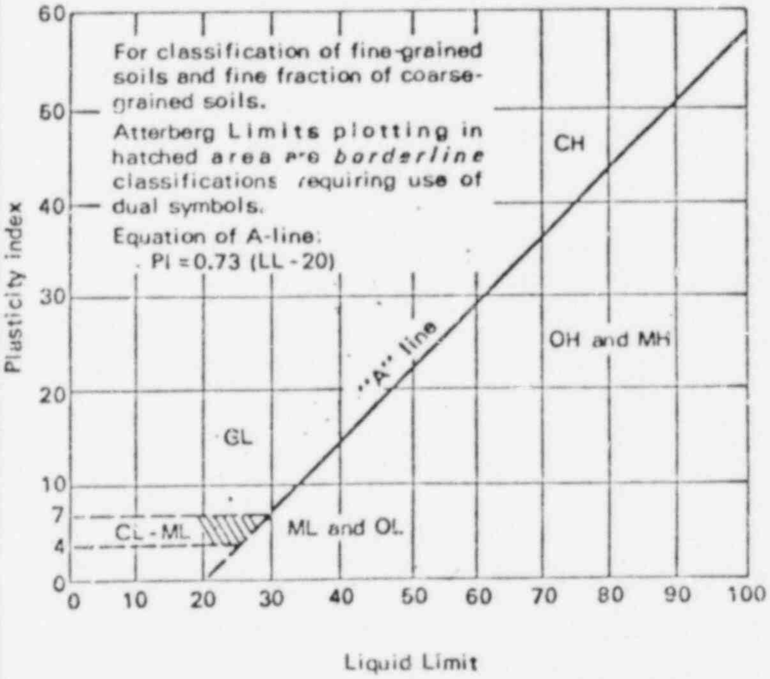
A	Auger Sample (disturbed)
SS	Drove split spoon - ASTM D1586 - field test on granular soils
ST	Pushed shelby tube - ASTM D1587 - for recovery of field sample
DC	Drive Cylinder - Thick wall drive sampler with stainless steel liner. Sampler outer diameter 3 1/8". Sample diameter 2½". Sampler driven by blows of 140 pound hammer falling 30 inches, ASTM D 1586 effort.
REC	Recovery - soil length obtained in sampler, inches
N	Standard penetration test (blows per ft.) for granular soils Example: 7/8/6 7 blows to set sampler, 8 blows per first 6" + 6 blows per last 6". N = 8 + 6 = 14.
P.P.	Pocket penetrometer test reading, in tons per sq. ft.
W/L	Water level symbol ▼
	Water levels shown on the boring logs are the levels measured in the borings at the time and under the conditions indicated. In sand the indicated levels are considered to be reliable groundwater levels. In clay it is not possible to determine the groundwater level within the normal scope of a test boring investigation, except where lenses or layers of more pervious waterbearing soil are present. Then, a long period of time may be necessary to reach equilibrium. Therefore, the position of the water level symbol for clay or mixed-texture soils may not indicate the true level of the groundwater table. The available water level information is given at the bottom of the log sheet.
q_u	Unconfined Compression Test
γ_m	Unit weight, in pcf, of naturally-occurring soil
γ_d	Unit oven dry weight, in pcf, of soil
w	Moisture content, as % of dry unit weight (also M.C.)
S.G.	Specific gravity of soil solids
Sr	Degree of saturation
e	Void Ratio
n	Porosity
Ø	Angle of Internal Friction, degrees
L.L.	Liquid Limit
P.L.	Plastic Limit
P.I.	Plasticity Index (LL-PL)
BLS	Bar Linear Shrinkage
c	Soil cohesion value

10276

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation: D 2487 – 69 AND D 2488 – 69

(Unified Soil Classification System)

Major divisions			Group symbols	Typical names	Classification criteria		
Coarse-grained soils More than 50% retained on No. 200 sieve*	Gravels 50% or more of coarse fraction retained on No. 4 sieve	Clean gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines Less than 5% pass No. 200 sieve . . . . . . GW, GP, SW, SP More than 12% pass No. 200 sieve . . . . . . GM, GC, SM, SC 5 to 12% pass No. 200 sieve . . . . *Borderline* classifications requiring use of dual symbols	$C_U = \frac{D_{60}}{D_{10}}$ greater than 4; $C_Z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW	
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Atterberg limits plotting in hatched area are *borderline* classifications requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean sands	SW	Well-graded sands and gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ greater than 6; $C_Z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW	
		Sands with fines	SM	Silty sands, sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Atterberg limits plotting in hatched area are *borderline* classifications requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils 50% or more passes No. 200 sieve*	Silts and clays Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	Plasticity Chart 		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	Silts and clays Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts			
			CH	Inorganic clays of high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity			
Highly organic soils			Pt	Peat, muck and other highly organic soils	*Based on the material passing the 3 in. (76 mm)		

For classification of fine-grained soils and fine fraction of coarse-grained soils.

Atterberg Limits plotting in hatched area are *borderline* classifications requiring use of dual symbols.

Equation of A-line:
PI = 0.73 (LL - 20)

10276