Sum 0.1

Oil shale reservation No 1 to No-8 - July 30, 1964 (extend to July 30, 66) July 30, 1965 = thereafter

| D2 # | | End | TD | Nahcara |
|---|---|---|---|---|
| 13 | 13-20-34-29 | 1394 | 105 | |
| 14 | 16-11-35-28 | 1290 | 75 | |
| 15 | 12-6-35-25 | 1660 | 355 | |
| 16c | 12-19-35-25 | 1400 | 205 | |
| 17 | 15-13-31-23 | 1390 | 233 | 84-241 |
| 18 | 1-4-24-21 | 1360 | 226 | |
| 14A | 16-12-34-29 | 1410 | 101 | |
| 20 | " 21-40-26 | " | " | |
| 21 | " 21-40-26 | | | |

2" diameter sample recovered.

Oil shale reservation No. 10 Oct 23, 1964 - removed - to Oct 23, 1966

SOUTH OIL COMPANY
CANADIAN PRODUCTION DIVISION
805 8TH AVE W
P O DRAWER 38
CALGARY, ALBERTA
CANADA



G E DUNLAP
MANAGER

L E TILLER
ASSISTANT MANAGER

M E AUSTIN
SUPT OPERATING DEPT

20 October 1964

Department of Mines and Natural Resources,
Mines Branch, Director's Office,
900 - Norquay Building - 401 York Avenue,
WINNIPEG 1, Manitoba.

Attention Mr J. S Richards

Dear Sir

Pursuant to my letter dated October 9th, I have just obtained final locations of our test holes which are needed for our "road allowance permit" We have found it difficult to determine locations in advance Our locations are as follows These include the first two locations which I have previously given you in my letter of October 9th

| | | | Ground Elevation | TD |
|---|---|---|---|---|
| 1 | Core Hole 13 | Lsd 13, Section 20, Township 34, Range 29, WPM | 1394 feet | 105 ft. |
| 2. | Core Hole 14 | Lsd 16, Section 11, Township 35, Range 28, WPM | 1290 feet | 175 ft |
| 3. | Core Hole 15 | Lsd. 12, Section 6, Township 35, Range 25, WPM | 1660 feet | 355 ft |
| 4 | Core Hole 16 C | Lsd 12, Section 19, Township 35, Range 25, WPM | 1400 feet | 205 ft. |
| 5. | Core Hole 17 | Lsd 15, Section 13, Township 31, Range 23, WPM | 1390 feet | 233 ft |
| 6 | Core Hole 18 | Lsd 1, Section 4, Township 24, Range 21, WPM | 1360 feet | 226 ft. |
| 7 | Core Hole 19 A | Lsd 16, Section 12, Township 34, Range 29, WPM | 1410 feet | 101 ft |
| 8 | Core Hole 20 | Lsd ?, Section 21, Township 40, Range 26, WPM | ? | ? |

(We do not have the exact location for this hole as yet but should have it by tomorrow and will forward the information immediately )

Sun Oil has not employed explosives in their boring operations in any manner. We have not bull dozed any roads and have not cut timber. I have been told by our Field Supervisor, Mr. R. D. Chaney, that we have not even cut a bush.

We are using a Failing CFD-1 Hole Master drill with 2 7/8 inch drill pipe and we are drilling a 5 5/8 inch hole to recover our samples. We are recovering a 2 inch diameter sample in lengths of approximately 5 feet.

We found it necessary to use water as a drilling fluid in all cases in Manitoba. This water is obtained from any nearby creek or road ditch and is carried in a 650 gallon tank on our water truck.

Upon completion of our boring we fill the hole with drilling mud as much as possible. We then insert a 4 foot wooden plug in the hole to a depth of 2 feet below the surface. We place a wooden plank approximately 2 inches thick by 1 foot wide by 2 feet long immediately over the wooden plug and we fill the hole above the plank with dry cement to a depth of at least 6 inches. We fill and tamp the top of the hole using drill cuttings or surface material. We scatter the remainder of our cuttings and level and clear the location and we clean up the entire site so as to return it as nearly to the original state as reasonable. We conduct our operations in a fashion so as to cause minimum inconvenience and no dissatisfaction to anyone.

Our drilling contractor is Sedco Exploration Limited, 915 - 42nd Avenue S.E., Calgary, and our Field Supervisor is Mr. R. D. Chaney who is also Field Supervisor for our Seismograph Department but has been working directly on this operation in the field most of the time.

I should perhaps note that in two instances it was necessary to drill more than one surface hole due to boulders. However, in each such case these holes were plugged in the fashion described above.

While our boring was in operation, our field men noticed a core hole drilling crew which was drilling a hole one mile north of our Core Hole 13. We attempted to find out for whom they were drilling but were unable to do so. The drilling equipment bore a sign "Midwest Drilling" with a Winnipeg address. They appeared to be using an auger to drill the hole while intermittently taking a core.

I trust that this letter will satisfactorily supply the

information you need As I have advised in the past, we will be supplying you with the results obtained from these holes I anticipate that there will be some delay due to the length of time required to process this material.

Yours very truly

EECss

E. E Gilbert

p. c. to: Mr. M. J. Gobert,
Assistant Deputy Minister.

Dr. J. F.Davies,
Chief Geologist.

Mr. T. Morgan,
Chief Mining Recorder.

Mr. R. H. Junker,
Chief Mining Engineer.

# RESERVATIONS APPLIED FOR

| | Township | Range |
|---|---|---|
| Reservation #1 | 21 | Pt. 15 |
| | 21 | Pt. 16 |
| | 22 | 16 |
| | 23 | 17 |
| | 24 | Pt. 17 |
| | 23 | Pt. 18 |
| | 24 | Pt. 18 |
| | 23 | Pt. 19 |
| | 24 | Pt. 19 |
| | 24 | 20 |
| | 24 | 21 |
| | 25 | 21 |
| | 26 | 21 |
| | 27 | 21 |
| | 28 | Pt 21 |
| | 26 | Pt. 22 |
| | 27 | Pt. 22 |
| | 28 | 22 |
| | 29 | 22 |
| | 30 | Pt 22 |
| Reservation #2 | 30 | Pt. 22 |
| | 31 | 22 |
| | 32 | Pt. 22 |
| | 33 | Pt 22 |
| | 30 | 23 |
| | 31 | 23 |
| | 32 | 23 |
| | 33 | 23 |
| | 30 | 24 |
| | 31 | 24 |
| Reservation #3 | 34 | 23 |
| | 35 | Pt. 23 |
| | 36 | Pt. 23 |
| | 32 | 24 |
| | 33 | 24 |
| | 34 | 24 |
| | 35 | 24 |
| | 36 | Pt. 24 |
| | 34 | 25 |
| | 35 | 25 |
| | 36 | Pt. 25 |
| | 36 | Pt. 26 |

| | Township | Range |
|---|---|---|
| Reservation #4 | 32 | 25 |
| | 33 | 25 |
| | 33 | 26 |
| | 34 | 26 |
| | 35 | 26 |
| | 33 | 27 |
| | 34 | 27 |
| | 35 | 27 |
| | 33 | 28 |
| | 34 | 28 |
| | 34 | 29 |
| Reservation #5 | 39 | 26 |
| | 40 | Pt. 26 |
| | 38 | 27 |
| | 39 | 27 |
| | 35 | 28 |
| | 37 | 28 |
| | 38 | 28 |
| | 39 | 28 |
| | 35 | 29 |
| | 36 | 29 |
| | 37 | 29 |
| | 38 | 29 |
| Reservation #6 | 41 | Pt. 25 |
| | 42 | Pt. 25 |
| | 40 | Pt. 26 |
| | 41 | 26 |
| | 42 | 26 |
| | 43 | 26 |
| | 44 | 26 |
| | 40 | 27 |
| | 44 | 27 |
| | 40 | 28 |
| Reservation #7 | 42 | 27 |
| | 43 | 27 |
| | 42 | 28 |
| | 43 | 28 |
| | 44 | 28 |
| | 42 | 29 |
| | 43 | 29 |
| | 44 | 29 |
| Reservation #8 | 41 | 27 |
| | 41 | 28 |
| | 39 | 29 |
| | 40 | 29 |
| | 41 | 29 |

June 21, 1965

Department of Mines & Natural Resources,
Mines Branch, Directors Office,
901 Norquay Building, 401 York Avenue,
WINNIPEG 1, Manitoba

Attention Mr. J S. Richards

Dear Sir

Prior to my meeting with you and other members of your Government I thought that a review of our voluminous files on Oil Shale might be of assistance to you and this would serve also as a report on our activities to date

It is of interest to note that in less than a year of following the various aspects of Oil Shale research in Canada, my office alone has a full filing cabinet drawer filled with reports, studies, correspondence of all types and our various research departments and consultants tell me that they too are building up masses of additional work results

Although our first Manitoba Reservations are dated July 30, 1964, our first step in evaluation of these reservations was performed before this date though following our earlier discussions with you Our geological field party spent most of July in Manitoba attempting to relocate the Oil Shale Outcrops reported by Dr Wickenden in early government reports They worked north and south from the Ochre River Our geologists found that many of the reported outcrops had been unearthed by "Trenching" and they were not locateable today Samples were obtained from as many locations as possible and these samples were sent by air to the Colorado School of Mines at Golden, Colorado for analysis as to the gallons of oil per ton

The samples were analyzed in August of 1964 and as the results were obtained they were plotted on maps constructed for the purpose The analyses of these outcrop samples were very poor with very uneconomic gallonages per ton ranging from 0 9 to 9 5 g/t. and with only one occurrence of the higher grade In addition these outcrop samples were felt to have been poorer due to their long weathering in the atmosphere.

Continued

In view of the poor results obtained from Surface Geology we considered the possibility of boring holes at the top of the subcrop to obtain unweathered samples, you will remember my letter of September 12, 1964 and your reply of September 25, 1964, following our meeting in Alberta. As a result I advised on September 29, 1964 that we were planning to proceed with a "boring" program in Manitoba which was more fully detailed in my letters of October 9, October 20, and November 4, 1964

We encountered many new problems with our "Bore hole" program and as a result of our problems and research to solve these problems I believe that other companies who are about to commence core hole programs will profit greatly because we did a considerable amount of work with the "Becker Drilling Ltd " and developed a means of utilizing a Rotary Coring Rig with double pipe using air to lift the core which is then recovered in five foot units You may remember seeing one of the Becker units working at the Great Canadian Oil Sands sight in Alberta at the time of our September visit This equipment was not available at the time we performed our Manitoba bore hole program, as a result the shale samples we obtained were covered by a thick greasy mud which we found extremely difficult to remove from the shale We found, however, that if it were not removed it lowered the analysis of the shale As a result we found it took much longer to clean the shale in our sample laboratory than it took to drill the hole in the field

Another problem we encountered was the extremely long delay in getting the shale analyses back from the Colorado School of Mines In some cases we flew the cores to Colorado but others were sent by truck and became entangled with customs at the border Most of our Manitoba analyses were received in March of 1965 and these were sent to you with my letter of March 19, 1965, which also enclosed two maps. I find some of our analyses from Manitoba have not yet been received We are tracing these now

As a result of the long delay in obtaining analyses we have devoted considerable effort to establishing other places for analysis We first attempted to establish an analysis laboratory at the Saskatchewan Research Council and a meeting was held by one of our Richardson Texas research men, Mr. C Hardy, with Dr. Brad Gunn from Saskatoon at the U S Bureau of Mines Laboratory in Laramie, Wyoming where they studied the methods used there Sun sent equipment from Texas to Saskatoon as a guide but the Research Council found they could not obtain copies of the equipment soon enough to speed our results We then learned that the Chemical and Geological Laboratories in Calgary could conduct the proper work and some of our shale samples were sent

Continued

there, however, we found the results showed a lower gallon per ton figure than we anticipated so finally we sent the remaining ball of the same cores to Colorado and we found that the results from the Calgary laboratory were lower As a result we are again sending all samples to the Colorado School of Mines

As we have indicated to you, the results of the analyses on our Manitoba Boring program have given relatively lower gallonage per ton figures than we had hoped for. In fact they are not much higher than the analyses obtained from our surface samples As a result we have selected the area of our highest gallon per ton analyses and again conducted a boring program using a closer spacing to our holes, the analyses have not all been received but reports to date indicate that the new holes between the older wider spaced holes are confirming the earlier results so that we currently feel that the various analyses, grade slowly and rather consistently from point to point along the subcrop.

We are now giving further thought to the possibility of drilling holes still further away from the Subcrop to see if the analyses will be higher but this may mean the drilling of holes to a depth of 1000 to 1300 feet as for example in the Duck Mountain or Porcupine Forest Preserve areas

Concurrent with our boring operations and continuing at present we have put our Richardson Texas Research Laboratory to work on still other aspects of the Oil Shales We have also hired Cameron and Jones who are an Engineering Consulting firm in Denver, Colorado, specializing in Oil Shale Research

Cameron and Jones have prepared and are currently preparing Economic studies of the whole project including mining studies, retort studies, and studies of the costs of constructing a full scale plant to produce 50,000 barrels of Oil Shale oil per day This appears to be the smallest size plant which would be economic to operate Their first such report was submitted January 29, 1965; further studies were reported February 25, 1965, and their final report utilizing presently known data is anticipated soon Some of their studies were reported at a meeting of Sun Oil representatives in Dallas during January, these showed that utilizing shale analyzing 16 gallons per ton and in order to build a 50,000 barrel per day plant we would need an outlay of -

$26 Million for Earth Moving and Mining
$56 Million for Retorting
$20 Million for Hydrogenation
$7-15 Million for a Pipeline

Continued

They also showed that mining costs at 35 cents per tone would vary from $1; 01 to $2 22 per barrel if the shale varied from 22 to 10 g/t.

We called upon Cameron and Jones also for assistance in improving our drilling technique and reports were received in this regard on September 23, 1964 and again on February 25, 1965

Cameron and Jones have also been making some reports on various Retorting techniques which might be utilized. On February 12, 1965 they reviewed for us the availability of their portable retort at the same time Cordero Mining, which is a subsidiary of Suns in the Mercury mining business, considered the possibility of altering their portable retort for our purposes

We have carried on negotiations with other engineering firms wherein we considered designing our own retort Meetings were held in this regard at Dallas, Texas and at other points during September, October and November.

Our Research laboratory at Richardson, Texas commenced "In Situ" research on oil shale in September and October of 1964. They utilized a portion of the cores obtained from the bore holes and reported in late October 1964 that the shale supported a combustion front at 1050°F and this combustion front moved at 2-02 feet per day and recovered about 70% of the oil in place Mechanical difficulties precluded full results We planned to conduct Air Injectivity tests during our Manitoba core hole program and in this regard we ran suite of 3 logs in two of our Manitoba Bore holes I am enclosing copies of these logs with this report. The logs run were 1) an Acoustic Log 2) a Gamma Gamma Density Log 3) a Neutron Log Reports from Colorado had indicated these could be utilized to compute gallons per ton. We have not run logs on other holes because we are interested in obtaining the more complete results which can be obtained from the actual cores - we did obtain cores from the same holes where the logs were obtained. Due to engineering problems we were not able to run the Air Injectivity tests though we are still hopeful of doing these in the future.

Retort research commenced at Richardson in October and November of 1964 again utilizing remnants of cores sent to Colorado In November of 1964 they reported that the oil produced showed an average Sulfur content of 7 24 wt %. In January 1965 "Richardson" designed and built a small retort and continued to use the shale remnants from Colorado analysis of our Canadian Shale We were anxious to produce a sufficient sample of the oil so that our Marcus Hook Pennsylvania Refinery Laboratory could properly analyze the oil for its

Continued...

refining characteristics. By March we had finally accumulated about a quart of the oil and this was sent to Marcus Hook. We feel we had spent some $50,000 or more to produce that one quart sample. The report from Marcus Hook dated March 10, 1965 is as follows:

| Tests | Retorted Shale Oil | |
|---|---|---|
| | Canadian | Colorado |
| Density $d_4^{20}$ | 9857 | 91 |
| Gravity °API | 11 5 | 18 b - 25 7 |
| Refractive Index | 1 5467 | ND |
| Pour Point °F | 15 | 90 |
| Viscosity at 100°F, SUS | 78 3 | ND |
| Viscosity at 210°F, SUS | 35 65 | 48 |
| % Carbon | 79 77 | 84 6 |
| % Hydrogen | 9 64 | 11 6 |
| % Sulfur | 6 87 | 0. 5 |
| % Nitrogen | 1 18 | 1 8 |
| % Oxygen | 2 74 | ND |
| Conradson Carbon | 4 | 4 5 |
| Bromine Number | 0 5 | ND |

There was insufficient sample for a complete analysis, and during May and June 1965 our Richardson engineers have met with our Marcus Hook engineers to work out a full scale analysis. Marcus Hook will require one and one half (1 5) gallons of Canadian Oil Shale oil so as to allow them to perform a "Screening test" they will break down the sample into its various "fractions" and determine whether these fractions can be used in the refinery. They will determine the proper refining method and determine whether there are any harmful elements in the crude. If preliminary tests indicate that the oil can be utilized they will determine its approximate market value.

Following the "Screening test" if the oil seems generallly useable our Richardson Lab will be called upon to produce 100 gallons of the raw oil or approximately two barrels. Marcus Hook will "hydrogenate" and study the final product so as to more accurately pin point the value of the final product.

Since approximately one-fourth of our cores taken to date, have been required to produce one quart of oil, it is obvious that we must build a bigger retort and actually dig out several tons of unweathered oil shale.

In December 1964 and January 1965 we held confidential meetings with another engineering firm and considered

Continued. . . .

building a retort which would analyze 1000 tons of oil shale. This would have required mining enough shale to fill a train load of railroad cars. Studies showed that the first phase would cost some $450,000 and the second phase would also cost about $450,000. This may still be done, however, it will probably follow a satisfactory evaluation of the oil by our Marcus Hook Laboratory.

In order to supply the oil for our Marcus Hook test our Richardson Laboratory has since January been designing a larger size retort and this is now being built in Richardson, Texas, it will require building a new laboratory building as well. This retort will be able to handle from several hundred pounds to one ton of shale at a time. We are awaiting dry field conditions to permit determination of the best place to select these larger samples of unweathered shale.

Office studies of the various results have been carried on in our Calgary Geological Department from the beginning and during April, May and June of 1965 Geological studies have been underway both in Saskatoon, Saskatchewan and in Calgary. One of these studies is being conducted by Mr. Price of the Geological Survey of Canada. He has taken sample cuts of our various samples both in Manitoba and in Saskatchewan, and is making Micro fossil studies of the environment of deposition to give what assistance they can in tracking down the location of the richer deposits and where the two petroliferous horizons just meet and are richest.

Mr. Price is also studying relationships between fish remains and the "foraminifera" in the speckled shale. This may assist us in our studies.

We have made some studies pertaining to the vegetation covering the Shale outcrop and have found that the "Black Spruce" seem to grow on the Oil Shale outcrop whereas the "Poplar" and "Birch" grow on the overlying and underlying outcrops.

Our Exploration Manager will be meeting our Richardson Laboratory engineers at Grand Junction, Colorado, on June 24th, 1965 to visit the "Rifle" and "Colony" Oil Shale plants and to discuss our current plans. Both the Rifle and Colony plants are Pilot projects which are far from becoming commercial in size or immediate plans.

I believe this long letter summarizes most of our field operations in various areas, to date. Some of the information I have given is confidential but I feel it shows that we commenced our field operations early, carried them on through the period when your government permits a full six months delay and that we are proceeding

Continued.

ahead constantly towards a goal of finding oil shales which are sufficiently rich to economically justify plant construction. As I said in my letter of July 17, 1964, setting out our program of evaluation, "The problems associated with our oil shale exploration are entirely new -". There is a lot for us to learn but our results to date will, I sincerely feel, aid us in reaching our goal of the construction of the first Canadian Oil Shale extraction plant.

In conclusion I would like to say that I am ready, at any time, (except hopefully August 1965) to meet with you to assist in formulating the balance of your Oil Shale Regulations.

I remain,

Very truly yours,

E E Gilbert

Encl.

EEG/gm

Received from Dorothy Dec. 5, 1967

# MANITOBA OIL SHALE PERMITS, Summary Report

Summary

In the spring of 1964, Sun Oil Company became interested in oil shales, and filed on 500,000 acres of potential oil shale land on the Pasquia Hills of east-central Saskatchewan

A literature search revealed the Geological Survey of Canada had mapped the outcrop of the oil shales along the Manitoba Escarpment and the results of this work had been published in Memoir 239, "Mesozoic Stratigraphy of the Eastern Plains, Manitoba and Saskatchewan" Using this report as a guide Sun Oil Company filed on a total of 1,585,799 acres in Manitoba by the end of 1964

The oil shale is of upper Cretaceous, Colorado age It consists of the Boyne and Morden members of the Vermillion River formation, and of the Favel formation (in order of increasing age) The Boyne member is the 1st White Specks of the sub-surface geologists, the Morden is the barren zone, while the Favel is the 2nd White Specks The Boyne is a black limy shale, speckled white by agglomerates of foraminifera The Morden is a black, non-limy shale, while the Favel is also a black limy shale speckled white with foraminifera The oil shales vary considerably in thickness, being 125 feet thick in Core Hole 17 (Sec 13-31-23 W1) and thinning to 67 feet in Core Hole 16 (Sec 24-35-26 W1)

A field party armed with Memoir 239 was dispatched in July 1964 to channel sample all outcrops of oil shales from Twp 20 north to the Saskatchewan border We felt that analyses of these samples would indicate if the values of the shales varied regionally, and where the best values would be

Topographic relief along the Manitoba Escarpment is low, and outcrops of oil shales rare and badly scattered The party hoped to find good cutbanks that could be excavated for unweathered samples but because of the small size of outcrops this was not possible The quantities of oil in the samples were small, and we could find no references in the literature to the effect of weathering on the oil content of the shales

With the failure of our outcrop sampling program, we planned a series of core holes along the Manitoba escarpment to check the mapped position of the oil shales outcrop, and to obtain unweathered cores for analysis of oil content Because of bentonite bands within the oil shales, cores were to be cut using air as the circulating medium, rather than the more usual water or mud

Coring began about the middle of October It was soon apparent that there were many acquifers along the eastern slope of the Escarpment, and the air compressor on the core rig was unable to overcome the quantities of water encountered The drilling crew, therefore, had to revert to water as a circulating medium The difficulty of obtaining water under winter conditions cut our program short

Twelve holes involving 763 feet of coring and 909 feet of drilling were located in Manitoba The cores from six of these tests were sent to Colorado School of Mines Research Foundation in Golden, Colorado for analysis

The analyses showed consistently low oil yields in our southern group of holdings Core Hole 17 in Sec 13-31-23 W1 contained one sample yielding over 10 gallons/ton Core Hole 16C in Sec 19-35-25 W1 gave one sample analyzing over 10 gallons/ton, while Core Hole 19A in Sec 12-34-29 W1 had nothing over 10 gallons/ton In comparison, cores cut in the Pasquia Hills of Saskatchewan had values of more than 20 gallons/ton

An economic evaluation was then made of Sun's oil shale acreage in Manitoba In addition to the problem of low oil content in the shales, the problem of freehold land checkerboarded in Sun's oil shale permits became apparent

The twin factors of low oil values and high development costs, therefore, resulted in Sun Oil Company dropping its oil shale permits in Manitoba

In addition to the money spent on the evaluation of the oil shale permits, Sun has spent considerable sums on research into the problems of oil shale retorting

W H Tisdall,
P Eng

WHT/md

# Sun Oil - Manitoba Oil Shale Permits

| | | | | |
|---|---|---|---|---|
| C.H. 13 | NW 20-34-29W<br>(Sampled interval | | 76' - 105') | |
| C.H. 17 | 13-31-23W<br>Favel 84' to 201' | K B. | 1390' | Depth - 233' |
| C.H. 18 | 4-24-21W<br>(Sampled interval | K.B | 1360'<br>17' to 126' | |
| C.H. 19A | 12-34-29W<br>Favel 38' to 93'<br>(Sampled interval | K.B. | 1410'<br>35' - 101') | |
| C.H. 16C | 12-19-35-25W<br>Favel 100' to 180'<br>(Sampled interval | K.B. | 1400'<br>42' - 187') | Depth - 205' |
| C.H. 20 | 21-40-26W<br>(Sampled interval | | 65' - 164') | |
| C.H 21 | 21-40-26W<br>(Sampled interval | | 141' - 174') | |

Revised Edition (13)



Date Reported. May 25, 1965

Sun Oil Company

Laboratory Report Number. C7372-A

| Number | Hole | Core | Bag | Oil Gal/Ton | Water Gal/Ton | Specific Gravity @ 60°F. | A.P.I. Gravity @ 60°F. | |
|---|---|---|---|---|---|---|---|---|
| 51 | 13 | 2 | 1 of 1 | 6.8 | 22.3 | 0.963 | 15.4 | 20-34-29W1 |
| 52 | 13 | 3 | 1 of 1 | 8.6 | 23.2 | 0.963 | 15.4 | C.H #13 |
| 53 | 13 | 4 | 1 of 1 | 7.3 | 20.9 | 0.961 | 15.7 | |
| 54 | 13 | 5 | 1 of 1 | 14.3 | 30.3 | 0.961 | 15.7 | |
| 55 | 13 | 6 | 1 of 2 | 3.3 | 33.3 | 0.961 | 15.7 | 20-34-29W1 |
| 56 | 13 | 6 | 2 of 2 | 3.7 | 36.9 | 0.961 | 15.7 | |
| 57 | 13 | 7 | 1 of 2 | 2.9 | 32.1 | 0.961 | 15.7 | |
| 58 | 13 | 7 | 2 of 2 | 2.4 | 34.0 | 0.961 | 15.7 | |
| 59 | 20 | 1 | 1 of 1 | 0.1 | 6.7 | 0.969 | 14.5 | 21-40-26W1 |
| 60 | 20 | 3 | 1 of 1 | 8.3 | 12.1 | 0.969 | 14.5 | |
| 61 | 20 | 4 | 1 of 2 | 6.5 | 18.8 | 0.954 | 16.8 | C.H #20 |
| 62 | 20 | 4 | 2 of 2 | 6.4 | 13.8 | 0.954 | 16.8 | |
| 63 | 20 | 5 | 1 of 2 | 10.1 | 20.9 | 0.977 | 13.3 | |
| 64 | 20 | 5 | 2 of 2 | 11.9 | 17.0 | 0.973 | 13.9 | |
| 65 | 20 | 6 | 1 of 1 | 9.5 | 17.6 | 0.971 | 14.2 | |
| 66 | 20 | 7 | 1 of 2 | 4.4 | 8.9 | 0.966 | 15.0 | |
| 67 | 20 | 7 | 2 of 2 | 5.2 | 9.2 | 0.966 | 15.0 | |

(13-14)

Continued Page 4

Date Reported. May 25, 1965

Sun Oil Company

Laboratory Report Number. C7372-A

| Number | Hole | Core | Bag | Oil Gal/Ton | Water Gal/Ton | Specific Gravity @ 60°F. | A.P.I. Gravity @ 60°F. |
|---|---|---|---|---|---|---|---|
| 68 | 20 | 8 141-149 | 1 of 3 | 4.8 | 8.0 | 0.973 | 13.2 |
| 69 | 20 | 8 | 2 of 3 | 7.9 | 16.4 | 0.978 | 13.2 |
| 70 | 20 | 8 | 3 of 3 | 9.7 | 15.5 | 0.978 | 13.2 |
| 71 | 20 | 9 149-156 | 1 of 1 | 4.2 | 29.2 | 0.960 | 15.9 |
| 72 | 20 | 10 156-164 | 1 of 1 | 3.8 | 9.2 | 0.960 | 15.9 |
| 73 | 21 | 15 141-149 | 1 of 2 | 6.3 | 30.9 | 0.975 | 13.6 |
| 74 | 21 | 15 | 2 of 2 | 9.6 | 34.3 | 0.975 | 13.6 |
| 75 | 21 | 16 149-158 | 1 of 2 | 8.9 | 35.4 | 0.975 | 13.6 |
| 76 | 21 | 16 | 2 of 2 | 7.5 | 38.8 | 0.974 | 13.8 |
| 77 | 21 | 17 158-164 | 1 of 3 | 5.7 | 28.5 | 0.978 | 13.2 |
| 78 | 21 | 17 | 2 of 3 | 7.6 | 40.5 | 0.978 | 13.2 |
| 79 | 21 | 17 | 3 of 3 | 5.4 | 34.3 | 0.978 | 13.2 |
| 80 | 21 | 18 164-171 | 1 of 1 | 6.6 | 36.3 | 0.974 | 13.8 |
| 81 | 21 | 19 171-174 | 1 of 1 | 10.0 | 24.3 | 0.950 | 17.5 |

CH 20 20

21-40-26W

CH # 21

21-40-26W

* An assumed specific gravity was used on sample number 81.

Note.

Composite specific gravities were determined since there was insufficient oil recovered for individual determinations in most cases.

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 2 GOLDEN, COLORADO

Lab Group Number 219-64
Project Number 840703
Project Engineer W. H. Reeves
(13)-5

# ANALYTICAL LABORATORY REPORT

647-

Sponsor Sun Oil Company
Date Submitted July 29, 1964

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1373 | | Bag #10 Core #24 | | 0.0 | | 8.80 | | 0.970 | * | | | | | | | | | | | |
| 1374 | 213-223 | Bag #1 Core #25 | | 1.81 | | 9.42 | | " | * | | | | | | | | | | | |
| 1375 | | " 2 " 25 | | 1.73 | | 8.98 | | " | * | | | | | | | | | | | |
| 1376 | | " 3 " 25 | | 0.93 | | 8.42 | | " | * | | | | | | | | | | | |
| 1377 | | " 4 " 25 | | | | | | | | | | | | | | | | | | |
| | | Pan I | | 0.95 | | 6.76 | | " | * | | | | | | | | | | | |
| 1378 | | " 4 " 25 | | | | | | | | | | | | | | | | | | |
| | | Pan II | | 0.97 | | 7.39 | | " | * | | | | | | | | | | | |
| 1379 | | " 5 " 25 | | 0.53 | | 8.43 | | " | * | | | | | | | | | | | |
| 1380 | | " 6 " 25 | | 0.29 | | 8.58 | | " | * | | | | | | | | | | | |
| 1381 | | L - 1 - A | | 4.86 | | 7.32 | | " | * | | | | | | | | | | | |
| 1382 | | L - 1 - B | | 6.61 | | 9.06 | | " | * | | | | | | | | | | | |
| 1383 | | L - 1 - C | | 9.50 | | 10.5 | | " | * | | | | | | | | | | | |
| 1384 | | L - 1 - X | | 5.86 | | 8.17 | | " | * | | | | | | | | | | | |
| 1385 | | L - 1 - Y | | 7.95 | | 7.00 | | " | * | | | | | | | | | | | |
| 1386 | | L - 2 - A | | 7.01 | | 5.52 | | " | * | | | | | | | | | | | |
| 1387 | | L - 2 - B | | 4.35 | | 7.96 | | " | * | | | | | | | | | | | |
| 1388 | | L - 2 - C | | 5.98 | | 12.0 | | " | * | | | | | | | | | | | |
| 1389 | | L - 2 - X | | 1.28 | | 10.3 | | " | * | | | | | | | | | | | |
| 1390 | | L - 3 - A | | 7.56 | | 6.65 | | " | * | | | | | | | | | | | |
| 1391 | | L - 3 - B | | 2.68 | | 5.57 | | " | * | | | | | | | | | | | |
| 1392 | | L - 3 - C | | 1.37 | | 8.37 | | " | * | | | | | | | | | | | |
| 1393 | | L - 4 - A | | 0.77 | | 14.3 | | " | * | | | | | | | | | | | |
| 1394 | | L - 4 - C | | 1.86 | | 10.7 | | " | * | | | | | | | | | | | |
| 1395 | | L - 5 - A | | 1.79 | | 3.44 | | " | * | | | | | | | | | | | |

Scattered outcrop samples

Remarks * Specific gravity of 0.970 determined from composite of samples in group.

Supervisor [signature] Date reported July 30, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. [redacted] GOLDEN, COLORADO

Lab Group Number 219-64

Project Number 840703 Project Engineer W. H. Reeve[redacted]

(13)-6

# ANALYTICAL LABORATORY REPORT

647-

Sponsor Sun Oil Company Date Submitted July 29, 1964

| Lab No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1396 | | L - 5 - B | | 3.54 | | 3.10 | | 0.970 | * | | | | | | | | | | | |
| 1397 | | L - 5 - C | | 1.99 | | 1.92 | | " | * | | | | | | | | | | | |
| 1398 | | L - 6 - A | | 4.95 | | 7.89 | | " | * | | | | | | | | | | | |
| [illegible]99 | | L - 6 - B | | 2.10 | | 9.27 | | " | * | | | | | | | | | | | |
| 1400 | | L - 6 - C | | 5.64 | | 4.36 | | " | * | | | | | | | | | | | |
| 1401 | | T - 1 | | 4.18 | | 19.5 | | " | * | | | | | | | | | | | |
| 1402 | | T - 2 | | 1.18 | | 19.9 | | " | * | | | | | | | | | | | |
| 1403 | | T - 3 | | 3.25 | | 31.3 | | " | * | | | | | | | | | | | |
| 1404 | | L - 4 - B | | 0.88 | | 18.0 | | " | * | | | | | | | | | | | |
| 1405 | | T - 5 - A | | 0.87 | | 5.07 | | " | * | | | | | | | | | | | |
| 1406 | Sack | T - 5 - B | | 0.83 | | 5.34 | | " | * | | | | | | | | | | | |
| 1407 | | T - 5 - C | | 1.29 | | 17.3 | | " | * | | | | | | | | | | | |
| 1408 | | T - 6 - A | | 1.03 | | 10.0 | | " | * | | | | | | | | | | | |
| 1409 | | T - 6 - B | | 0.99 | | 17.8 | | " | * | | | | | | | | | | | |
| [illegible]10 | | T - 6 - C | | 3.55 | | 12.6 | | " | * | | | | | | | | | | | |
| 1411 | | T - 9 - A | | 0.70 | | 2.66 | | " | * | | | | | | | | | | | |
| 1412 | | T - 9 - B | | 0.0 | | 6.81 | | " | * | | | | | | | | | | | |
| 1413 | | T - 9 - C | | 2.03 | | 12.4 | | " | * | | | | | | | | | | | |
| 1414 | | T - 10 - A | | 6.09 | | 5.17 | | " | * | | | | | | | | | | | |
| 1415 | | T - 10 - B | | 4.26 | | 4.77 | | " | * | | | | | | | | | | | |
| 1416 | | T - 11 | | 4.01 | | 17.0 | | " | * | | | | | | | | | | | |
| 1417 | | T - 12 - A | | 0.69 | | 13.2 | | " | * | | | | | | | | | | | |
| 1418 | | T - 12 - B | | 0.37 | | 12.3 | | " | * | | | | | | | | | | | |
| 1419 | | T - 12 - C | | 1.73 | | 14.0 | | " | * | | | | | | | | | | | |
| 1420 | | T - 13 | | 0.99 | | 11.2 | | " | * | | | | | | | | | | | |

Remarks * Specific gravity of 0.970 determined from composite of samples in group.

Supervisor W. H. Reeve Date Reported July 30, 1964

PAGE NO. [redacted] GOLDEN, COLORADO

Project Number 840703 Project Engineer W. H. Reeves [redacted]

(13)-7

# ANALYTICAL LABORATORY REPORT

647-

Sponsor Sun Oil Company Date Submitted July 29, 1964

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1421 | | T - 14 | | 1.52 | | 14.9 | | 0.970 | * | | | | | | | | | | | |
| 1422 | | T - 15 - B | | 1.08 | | 18.1 | | " | * | | | | | | | | | | | |
| 1423 | | T - 15 - C | | 1.53 | | 13.8 | | " | * | | | | | | | | | | | |
| 1424 | | T - 16 - A | | 2.32 | | 15.5 | | " | * | | | | | | | | | | | |
| 1425 | | T - 16 - B | | 3.34 | | 16.9 | | " | * | | | | | | | | | | | |
| 1426 | | T - 16 - C | | 2.10 | | 11.2 | | " | * | | | | | | | | | | | |

Remarks * Specific gravity of 0.970 determined from composite of samples in group.

Supervisor [signature] Date Reported July 30, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 1 Golden, Colorado

6412- ANALYTICAL LABORATORY REPORT

Lab Group Number 678-64
Project Number 840703
Sponsor Sun Oil Company

Project Engineer: W H Re[illegible]es
Date Submitted December 28, 1964

C H #16 C Manitoba (2-19-35 25 W)

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2698 | 42 44 | Hole 16 C, Core 1, | | 0 57 | | 5 40 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2699 | 44-49 | Hole 16 C, Core 2, | | 0 29 | | 4.38 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2700 | 49-54 | Hole 16 C, Core 3, | | 0 60 | | 4 87 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2701 | 54-57 | Hole 16 C, Core 4, | | 0 66 | | 5.02 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2702 | 59-64 | Hole 16 C, Core 5, | | 0 78 | | 3 72 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2703 | 64-69 | Hole 16 C, Core 6, | | 0 22 | | 4 72 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2704 | 69-74 | Hole 16 C, Core 7, | | Trace | | 7 47 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2705 | | Hole 16 C, Core 7, | | 0 34 | | 3 78 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2706 | 74 79 | Hole 16 C, Core 8, | | 0 46 | | 4 85 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2707 | 79-84 | Hole 16 C, Core 9, | | Trace | | 9.15 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2708 | 84-90 | Hole 16 C, Core 10, | | Trace | | 9 90 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2709 | | Hole 16 C, Core 10, | | Trace | | 8 50 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Sec 18 35-25 W1
KB 1400'
Depth 205'
Top Niobrara 100'
Base 180'

Remarks * Specific gravity calculated from average of group.

Supervisor [illegible]

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 2 Golden, Colorado
ANALYTICAL LABORATORY REPORT

Lab Group Number 678-64
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H Reeves
Date Submitted December 28, 1964

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6412-

| Lab. No | Samp No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2710 | | Hole 16 C, Core 10, | | Trace | | 6 87 | | 0 959 | * | | | | | | | | | | | |
| | " | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2711 | 90 95 | Hole 16 C, Core 11, | | Trace | | 10 5 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2712 | | Hole 16 C, Core 11, | | Trace | | 8 53 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2713 | 95-100 | Hole 16 C, Core 12, | | Trace | | 7 09 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2714 | | Hole 16 C, Core 12, | | Trace | | 8 39 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | ← Top | | | | | | | | | | |
| 2715 | 100-105 | Hole 16 C, Core 13, | | Trace | | 10 7 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2716 | 105-110 | Hole 16 C, Core 14, | | 2.11 | | 8 62 | | 0 950 | | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2717 | 110-115 | Hole 16 C, Core 15, | | 2.83 | | 9.31 | | 0.964 | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2718 | | Hole 16 C, Core 15, | | 3 03 | | 7 96 | | 0 956 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2719 | 115-120 | Hole 16 C, Core 16, | | 2 80 | | 11 0 | | 0 966 | | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2720 | 120-125 | Hole 16 C, Core 17, | | 6.31 | | 6.10 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2721 | | Hole 16 C, Core 17, | | 9 67 | | 7 11 | | 0 956 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

emarks * Specific gravity calculated from average of group.

rvisor W H Reeves

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 3 Golden, Colorado
ANALYTICAL LABORATORY REPORT

Lab Group Number 678-64
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H Re[illegible]es
Date Submitted December 28, 1964

(13)-10

6412-

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2722 | 125-130 | Hole 16 C, Core 18, | | 10 7 | | 8 85 | | 0 960 | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2723 | | Hole 16 C, Core 18, | | 9 36 | | 6 51 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2724 | 130-135 | Hole 16 C, Core 19, | | 6 67 | | 8.46 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2725 | | Hole 16 C, Core 19, | | 8 54 | | 7.99 | | 0 972 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2726 | 135 140 | Hole 16 C, Core 20, | | 6.98 | | 6 73 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2727 | | Hole 16 C, Core 20, | | 9.54 | | 6.79 | | 0.975 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2728 | 140-145 | Hole 16 C, Core 21, | | 7 28 | | 7 34 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| [illegible]9 | | Hole 16 C, Core 21, | | 7 25 | | 5.46 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2730 | 145-150 | Hole 16 C, Core 22, | | 6 13 | | 3 96 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2731 | | Hole 16 C, Core 22, | | 7 82 | | 6 04 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2732 | 150-157 | Hole 16 C, Core 23, | | 6 08 | | 4 41 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2733 | | Hole 16 C, Core 23, | | 3.16 | | 9.15 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor [signature]

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 4 Golden, Colorado
6412- ANALYTICAL LABORATORY REPORT

Lab Group Number 678-64
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H. [redacted]ves
Date Submitted December 28, 1964

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2734 | | Hole 16 C, Core 23, | | 9.86 | | 5.10 | | 0.966 | | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2735 | 157-165 | Hole 16 C, Core 24, | | 5 98 | | 4 43 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2736 | | Hole 16 C, Core 24, | | 5 00 | | 3 22 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2737 | 165-172 | Hole 16 C, Core 25, | | 6 97 | | 6 73 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2738 | | Hole 16 C, Core 25, | | 7.49 | | 5 49 | | 0 967 | | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 2739 | | Hole 16 C, Core 25, | | 7 20 | | 4.38 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2740 | 172 180 | Hole 16 C, Core 26, | | 6 79 | | 9 39 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | Base | | | | | | | | | | |
| 2741 | 180 157 | Hole 16 C, Core 27, | | 6 26 | | 9.05 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | Top | | | | | | | | | | |
| 2742 | 84-86' | Hole 17, Core 4, | | 4 88 | | 6 65 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2743 | 86-89 | Hole 17, Core 5, | | 4 08 | | 7 24 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2744 | 89-96' | Hole 17, Core 6, | | 8.38 | | 10.2 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2745 | 96 104 | Hole 17, Core 7, | | 5.59 | | 9 82 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |

Sec 13-31-23 W1
KB 1390
Depth 233'
Top Niobrara 84'
Base 201'

emarks * Specific gravity calculated from average of group.

upervisor [signature]

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 4 Golden, Colorado

ANALYTICAL LABORATORY REPORT

6412-

Lab Group Number 678-64

Project Number 840703

Sponsor Sun Oil Company

Project Engineer W H Reeves

Date Submitted December 28, 1964

C.H #17 manitoba

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2734 | | Hole 16 C, Core 23, | | 9 86 | | 5.10 | | 0 966 | | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2735 | 157-165 | Hole 16 C, Core 24, | | 5 98 | | 4.43 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2736 | | Hole 16 C, Core 24, | | 5 00 | | 3 22 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2737 | 165-172 | Hole 16 C, Core 25, | | 6 97 | | 6.73 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2738 | | Hole 16 C, Core 25, | | 7 49 | | 5 49 | | 0 967 | | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 2739 | | Hole 16 C, Core 25, | | 7 20 | | 4 38 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2740 | 172-180 | Hole 16 C, Core 26, | | 6 79 | | 9 39 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | Base | | | | | | | | | | |
| 2741 | 180 157 | Hole 16 C, Core 27, | | 6 26 | | 9.05 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | Top | | | | | | CORE HOLE #17 | | | | |
| 2742 | 84-86' | Hole 17, Core 4, | | 4 88 | | 6 65 | | 0.967 | * | | | | | | | Sec 13-31-23W1 | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | KB 1390 | | | | |
| 2743 | 86-89 | Hole 17, Core 5, | | 4 08 | | 7 24 | | 0 967 | * | | | | | | | Depth 233' | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | Top Niobrara | | 84 | | |
| 2744 | 89-96' | Hole 17, Core 6, | | 8.38 | | 10.2 | | 0.967 | * | | | | | | | Base | | 201' | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2745 | 96 104 | Hole 17, Core 7, | | 5 59 | | 9 82 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor W H Reeves

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 5 Golden, Colorado
6412- ANALYTICAL LABORATORY REPORT

Lab Group Number 678-64
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H Re[illegible]es
Date Submitted December 28, 1964

(13)-13

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2746 | | Hole 17, Core 7, | | 2.49 | | 5 57 | | 0 967 | * | | | SEC | 13-31-23 | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2747 | 104 111 | Hole 17, Core 8, | | 9 50 | | 5 63 | | 0 965 | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2748 | | Hole 17, Core 8, | | 5 98 | | 7 22 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2749 | 111-119 | Hole 17, Core 9, | | 8 06 | | 7.14 | | 0 958 | | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2750 | 119-126 | Hole 17, Core 10, | | 7.45 | | 5.55 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2751 | | Hole 17, Core 10, | | 7 56 | | 5 96 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 2752 | | Hole 17, Core 10, | | 7.68 | | 4.84 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2753 | 126-134 | Hole 17, Core 11, | | 7 54 | | 5.62 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 4 | | | | | | | | | | | | | | | | | | |
| 2754 | | Hole 17, Core 11, | | 7 98 | | 6.03 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 4 | | | | | | | | | | | | | | | | | | |
| 2755 | | Hole 17, Core 11, | | 10.5[illegible] | | 8.35 | | 0.964 | | | | | | | | | | | | |
| | | Bag 3 of 4 | | | | | | | | | | | | | | | | | | |
| 2756 | | Hole 17, Core 11, | | 7 74 | | 7 49 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 4 of 4 | | | | | | | | | | | | | | | | | | |
| 2757 | 134-141 | Hole 17, Core 12, | | 9.29 | | 7 42 | | 0 973 | | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |

emarks * Specific gravity calculated from average of group.

pervisor W H Reese

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 6 Golden, Colorado

ANALYTICAL LABORATORY REPORT

6412-

Lab Group Number 678-64

Project Number 840703

Sponsor Sun Oil Company

Project Engineer: W H Reeves

Date Submitted December 28, 1964

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2758 | | Hole 17, Core 12, | | 5 84 | | 5 03 | | 0 967 | * | | | | See 13-31-33 a/1 | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 2759 | | Hole 17, Core 12, | | 9 52 | | 6.37 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2760 | 141-149 | Hole 17, Core 13, | | 9 82 | | 7.01 | | 0 973 | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2761 | | Hole 17, Core 13, | | 6 67 | | 6 10 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2762 | 149-156 | Hole 17, Core 14, | | 3 95 | | 2 18 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2763 | 156-164 | Hole 17, Core 15, | | 7.58 | | 3 67 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2764 | | Hole 17, Core 15, | | 6 06 | | 3.26 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 2765 | | Hole 17, Core 15, | | 3 52 | | 5.87 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2766 | 164-171 | Hole 17, Core 16, | | 5 04 | | 3 17 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2767 | 171-179 | Hole 17, Core 17, | | 5.88 | | 3 56 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2768 | | Hole 17, Core 17, | | 7.21 | | 4.74 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2769 | 179-184 | Hole 17, Core 18, | | 8 40 | | 9.07 | | 0 967 | * | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor [signature]

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 7 Golden, Colorado
6412- ANALYTICAL LABORATORY REPORT

Lab Group Number 678-64
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H. Reeves
Date Submitted December 28, 1964

(13)-15

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2770 | 186-194 | Hole 17, Core 19, | | 9 02 | | 8.28 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2771 | 194-201 | Hole 17, Core 20, | | 6.36 | | 6 84 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | ← Base | | | | | | | | | | |
| 2772 | 201-209 | Hole 17, Core 21, | | 5 14 | | 9 34 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2773 | | Hole 17, Core 21, | | 6.57 | | 8 52 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2774 | 209-218 | Hole 17, Core 22, | | 3 01 | | 8 76 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2775 | 218-224 | Hole 17, Core 23, | | 0.28 | | 10 1 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2776 | | Hole 17, Core 22, | | 1 63 | | 10.8 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2777 | 224-233 | Hole 17, Core 24, | | 1.96 | | 11.3 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2778 | | Hole 17, Core 24, | | 2 56 | | 8 65 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2779 | 83-84 | Junk Sub 1 | | 4.72 | | 7 16 | | 0 967 | * | | | | | | | | | | | |

SEC 13-31-23 WH

Remarks * Specific gravity calculated from average of group.

Supervisor W H Reeves

Date Reported December 28, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 1 Golden, Colorado

Lab Group Number 708-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H Reeves (13)-16
Date Submitted July 14, 1965

657- ANALYTICAL LABORATORY REPORT Hole 18

Sec 4-24-21W1 Card 1360 Core hole #18

| Lab. No | Core Samp. No | Description | Bag | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 954 | J Sub 17-18 | Top only | 1 of 1 | | 0.00 | | 3 16 | | 0 965 | * | | | | | | | | | | | |
| 955 | 1 18-23 | Top | 1 of 1 | | Trace | | 16 5 | | 0 965 | * | | | | | | | | | | | |
| 956 | 2 23-29 | Top | 1 of 2 | | Trace | | 19.6 | | 0.965 | * | | | | | | | | | | | |
| 957 | 2 | Bottom | 1 of 2 | | 1.25 | | 14.4 | | 0 965 | * | | | | | | | | | | | |
| 958 | 3 29-36 | Bottom | 1 of 2 | | Trace | | 16.9 | | 0.965 | * | | | | | | | | | | | |
| 959 | 3 | Bottom Only | 2 of 2 | | Trace | | 17.6 | | 0.965 | * | | | | | | | | | | | |
| 960 | 4 36-44 | Bottom | 1 of 2 | | 1 19 | | 11 5 | | 0.965 | * | | | | | | | | | | | |
| 961 | 4 | Top | 2 of 2 | | 0.00 | | 12 1 | | 0.965 | * | | | | | | | | | | | |
| 962 | 5 44-51 | Top | 1 of 2 | | Trace | | 14 7 | | 0 965 | * | | | | | | | | | | | |
| 963 | 5 | Bottom | 1 of 2 | | Trace | | 13 0 | | 0.965 | * | | | | | | | | | | | |
| 964 | 6 51-59 | Top | 1 of 2 | | 2.10 | | 12 1 | | 0.965 | * | | | | | | | | | | | |
| 965 | 6 | Bottom | 1 of 2 | | 1.22 | | 16.9 | | 0.965 | * | | | | | | | | | | | |
| 966 | 7 59-66 | Bottom Only | 2 of 2 | | 0.99 | | 12.3 | | 0.965 | * | | | | | | | | | | | |
| 967 | 8 66-74 | Top | 1 of 2 | | Trace | | 13.8 | | 0.965 | * | | | | | | | | | | | |
| 968 | 8 | Bottom | 1 of 2 | | 0 32 | | 12 7 | | 0 965 | * | | | | | | | | | | | |
| 969 | 9 74-81 | Top | 1 of 2 | | 1.72 | | 11.6 | | 0.965 | * | | | | | | | | | | | |
| 970 | 9 | Bottom Only | 2 of 2 | | 2.12 | | 11.6 | | 0.965 | * | | | | | | | | | | | |
| 971 | 10 81-90 | Bottom | 1 of 2 | | Trace | | 19.7 | | 0 965 | * | | | | | | | | | | | |
| 972 | 10 | Top | 2 of 2 | | Trace | | 16 4 | | 0 965 | * | | | | | | | | | | | |
| 973 | 11 90-96 | Bottom Only | 2 of 2 | | Trace | | 20 3 | | 0 965 | * | | | | | | | | | | | |
| 974 | 12 96-104 | Bottom | 1 of 2 | | Trace | | 19 6 | | 0 965 | * | | | | | | | | | | | |
| 975 | 12 | Top only | 2 of 2 | | Trace | | 19 0 | | 0.965 | * | | | | | | | | | | | |
| 976 | 13 104-111 | Top | 1 of 1 | | 2.06 | | 14.2 | | 0.965 | * | | | | | | | | | | | |
| 977 | 14 111-119 | Bottom | 2 of 2 | | 2 47 | | 16 2 | | 0 965 | * | | | | | | | | | | | |
| 978 | 15 119-126 | Top | 1 of 2 | | 0 58 | | 16 7 | | 0.965 | * | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor C. F. Reeves

Date Reported July 15, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 4
Golden, Colorado ✓
652- ANALYTICAL LABORATORY REPORT

Lab Group Number 111-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer: W. H Reeves
Date Submitted February 5, 1965
C H. #19A Manitoba

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 283 | 35-40 | Hole 19A, Core 1, | | 9 08 | | 9 05 | | 0 968 | | | | | Sec. 12-34 29W1 | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 284 | 40 44 | Hole 19A, Core 2, | | 7 87 | | 7 42 | | 0 976 | | | | | KB 1410 | | | | | | | |
| | | Bag 1 | | | | | | | | | | | Top Nisku 38 | | | | | | | |
| 285 | 44-51 | Hole 19A, Core 3, | | 7.40 | | 8 73 | | 0.973 | | | | | Base - | | | 93 | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 286 | 51-57 | Hole 19A, Core 4, | | 6 77 | | 8 76 | | 0 972 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 287 | 57-59 | Hole 19A, Core 5, | | 7.06 | | 9.77 | | 0 974 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 288 | 59-66 | Hole 19A, Core 6, | | 9 15 | | 11 2 | | 0 979 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 289 | 66-72 | Hole 19A, Core 7, | | 7 92 | | 10.7 | | 0 973 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 290 | 72 79 | Hole 19A, Core 8, | | 7 92 | | 10 8 | | 0 979 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 291 | 79-86 | Hole 19A, Core 9, | | 2.07 | | 10 9 | | 0.970 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 292 | | Hole 19A, Core 9, | | 0 20 | | 17 0 | | 0 970 | * | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 293 | 86-94 | Hole 19A, Core 10, | | 3 41 | | 9.92 | | 0.970 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 294 | | Hole 19A, Core 10, | | 4 16 | | 11 1 | | 0 970 | * | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor [signature]

Date Reported February 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 5 Golden, Colorado
ANALYTICAL LABORATORY REPORT
652-

Lab Group Number 111-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer: W H. Reeves
Date Submitted February 5, 1965

(13)-18

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 295 | 94-101 | Hole 19A, Core 11, | | 1 23 | | 9 78 | | 0 956 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 296 | | Hole 19A, Core 11, | | 0.0 | | 12 5 | | --- | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | ← Top -83' | | | | | | | | | | | |
| 297 | 81-89 | Hole 27, Core 7, | | 11.1 | | 7 35 | | 0 962 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 298 | 89-96 | Hole 27, Core 8, | | 9.52 | | 6 20 | | 0 958 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 299 | 96-104 | Hole 27, Core 9, | | 9.12 | | 6.71 | | 0.957 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 300 | | Hole 27, Core 9, | | 10.7 | | 6 37 | | 0.956 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 301 | 104-111 | Hole 27, Core 10, | | 7.78 | | 7 06 | | 0 956 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 302 | 115 119 | Hole 27, Core 12, | | 8 48 | | 7.30 | | 0 953 | | | | | | | | | | | | |
| | . | Bag 1 | | | | | | | | | | | | | | | | | | |
| 303 | 119-126 | Hole 27, Core 13, | | 7.32 | | 9.75 | | 0.957 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 304 | 126-134 | Hole 27, Core 14, | | 6.69 | | 13 9 | | 0 952 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 305 | | Hole 27, Core 14, | | 5.13 | | 10 8 | | 0 943 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 306 | 134-141 | Hole 27, Core 15, | | 7 28 | | 6 92 | | 0 950 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Sec 15-48-11WX
KB 1250
Depth 186'
Top Niobrara 82'
Base " 160

SAP K

Remarks * Specific gravity calculated from average of group.

Supervisor W H Reeves

Date Reported February 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
Golden, Colorado

PAGE NO. 1

ANALYTICAL LABORATORY REPORT

6412-

Lab Group Number: 678-64
Project Number: 840703
Sponsor: Sun Oil Company

Project Engineer: W H. Reeves
Date Submitted: December 28, 1964

Hole #16 12-19-35-25W

| Lab. No. | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2698 | 42-44 | Hole 16 C, Core 1, | | 0 57 | | 5.40 | | 0.959 | * | | | | | Sec 16 | 35-25 W | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | KB | 1400' | | | | | |
| 2699 | 44-49 | Hole 16 C, Core 2, | | 0.29 | | 4.38 | | 0.959 | * | | | | | Depth | 205' | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | Top Niobrara | | | 100' | | | |
| 2700 | 49-54 | Hole 16 C, Core 3, | | 0.60 | | 4.87 | | 0.959 | * | | | | | Base | | | 180' | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2701 | 54-57 | Hole 16 C, Core 4, | | 0 66 | | 5.02 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2702 | 59-64 | Hole 16 C, Core 5, | | 0.78 | | 3.72 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2703 | 64-69 | Hole 16 C, Core 6, | | 0 22 | | 4.72 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2704 | 69-74 | Hole 16 C, Core 7, | | Trace | | 7 47 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2705 | | Hole 16 C, Core 7, | | 0 34 | | 3 78 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2706 | 74-79 | Hole 16 C, Core 8, | | 0 46 | | 4 85 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2707 | 79-84 | Hole 16 C, Core 9, | | Trace | | 9 15 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2708 | 84-90 | Hole 16 C, Core 10 | | Trace | | 9 90 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2709 | | Hole 16 C, Core 10 | | Trace | | 8 50 | | 0 959 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |

CH # 16 C.

* Specific gravity calculated from average of group

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 2 Golden, Colorado
ANALYTICAL LABORATORY REPORT
6412-

Lab Group Number 678-64
Project Number: 840703
Sponsor Sun Oil Company

Project Engineer W. H. Reeves
Date Submitted December 28, 1964

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2710 | | Hole 16 C, Core 10, | | Trace | | 6.87 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2711 | 90-95 | Hole 16 C, Core 11, | | Trace | | 10 5 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2712 | | Hole 16 C, Core 11, | | Trace | | 8.53 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2713 | 95-100 | Hole 16 C, Core 12, | | Trace | | 7.09 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2714 | | Hole 16 C, Core 12, | | Trace | | 8.39 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | ← Top | | | | | | | | | | |
| 2715 | 100-105 | Hole 16 C, Core 13, | | Trace | | 10.7 | | 0.959 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2716 | 105-110 | Hole 16 C, Core 14, | | 2.11 | | 8 62 | | 0.950 | | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2717 | 110-115 | Hole 16 C, Core 15, | | 2.83 | | 9.31 | | 0.964 | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2718 | | Hole 16 C, Core 15, | | 3.03 | | 7 96 | | 0 956 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2719 | 115-120 | Hole 16 C, Core 16, | | 2 80 | | 11 0 | | 0 966 | | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2720 | 120-125 | Hole 16 C, Core 17 | | 6.31 | | 6.10 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2721 | | Hole 16 C, Core 17 | | 9 67 | | 7 11 | | 0 956 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group

Supervisor [signature]

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. [redacted]
Golden, Colorado

ANALYTICAL LABORATORY REPORT

Lab Group Number 678-64
Project Number: 840703
Sponsor: Sun Oil Company

Project Engineer W H Reeves
Date Submitted December 28, 1964

6412-

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2722 | 125-130 | Hole 16 C, Core 18, | | 10 7 | | 8 85 | | 0.960 | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2723 | | Hole 16 C, Core 18, | | 9.36 | | 6.51 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2724 | 130-135 | Hole 16 C, Core 19, | | 6.67 | | 8.46 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2725 | | Hole 16 C, Core 19, | | 8.54 | | 7.99 | | 0 972 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2726 | 135-140 | Hole 16 C, Core 20, | | 6.98 | | 6 73 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2727 | | Hole 16 C, Core 20, | | 9.54 | | 6.79 | | 0.975 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2728 | 140-145 | Hole 16 C, Core 21, | | 7.28 | | 7 34 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| [illegible]9 | | Hole 16 C, Core 21, | | 7 25 | | 5.46 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2730 | 145-150 | Hole 16 C, Core 22, | | 6.13 | | 3 96 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2731 | | Hole 16 C, Core 22, | | 7 82 | | 6 04 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2732 | 150-157 | Hole 16 C, Core 23, | | 6 08 | / | 4 41 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2733 | | Hole 16 C, Core 23, | | 3 16 | | 9 15 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor [signature]

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 4 Golden, Colorado

ANALYTICAL LABORATORY REPORT

Lab Group Number: 678-64

Project Number: 840703

Sponsor Sun Oil Company

Project Engineer: W. H. Reeves

Date Submitted December 28, 1964

6412-

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2734 | | Hole 16 C, Core 23, | | 9 86 | | 5 10 | | 0.966 | | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2735 | 157-165 | Hole 16 C, Core 24, | | 5 98 | | 4.43 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2736 | | Hole 16 C, Core 24, | | 5 00 | | 3 22 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2737 | 165-172 | Hole 16 C, Core 25, | | 6.97 | | 6.73 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2738 | | Hole 16 C, Core 25, | | 7 49 | | 5 49 | | 0 967 | | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 2739 | | Hole 16 C, Core 25, | | 7 20 | | 4 38 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2740 | 172 180 | Hole 16 C, Core 26, | | 6 79 | | 9 39 | | 0 966 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | Base | | | | | | | | | | |
| 2741 | 180-187 | Hole 16 C, Core 27, | | 6 26 | | 9.05 | | 0.966 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | Top | | | | | | | | | | |
| 2742 | 84-86' | Hole 17, Core 4, | | 4 88 | | 6 65 | | 0.967 | * | | | | | | Sec 13-31-23W1 | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | KB 1390 | | | | | |
| 2743 | 86-89 | Hole 17, Core 5, | | 4 08 | | 7 24 | | 0 967 | * | | | | | | Depth 233' | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | Top Niobrara | | 84' | | | |
| 2744 | 89 96' | Hole 17, Core 6, | | 8.38 | | 10.2 | | 0.967 | * | | | | | | Base | | 201' | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2745 | 96 1.4 | Hole 17, Core 7, | | 5 59 | | 9 82 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Reviewed [illegible] December 28, 1964

Golden, Colorado

ANALYTICAL LABORATORY REPORT

6412-

Lab Group Number 678-64

Project Number 840703

Sponsor. Sun Oil Company

Project Engineer W. H. Rogers

Date Submitted December 28, 1964

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2746 | | Hole 17, Core 7, | | 2.49 | | 5 57 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2747 | 104 111 | Hole 17, Core 8, | | 9.50 | | 5 63 | | 0.965 | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2748 | | Hole 17, Core 8, | | 5.98 | | 7 22 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2749 | 111-119 | Hole 17, Core 9, | | 8 06 | | 7.14 | | 0.958 | | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2750 | 119-126 | Hole 17, Core 10, | | 7.45 | | 5 55 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2751 | | Hole 17, Core 10, | | 7.56 | | 5 96 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 2752 | | Hole 17, Core 10, | | 7.68 | | 4.84 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2753 | 126-134 | Hole 17, Core 11, | | 7 54 | | 5.62 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 4 | | | | | | | | | | | | | | | | | | |
| 2754 | | Hole 17, Core 11, | | 7 98 | | 6 03 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 4 | | | | | | | | | | | | | | | | | | |
| 2755 | | Hole 17, Core 11, | | 10 5 | | 8.35 | | 0.964 | | | | | | | | | | | | |
| | | Bag 3 of 4 | | | | | | | | | | | | | | | | | | |
| 2756 | | Hole 17, Core 11, | | 7 74 | | 7 49 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 4 of 4 | | | | | | | | | | | | | | | | | | |
| 2757 | 134-141 | Hole 17, Core 12, | | 9 29 | | 7 42 | | 0 973 | | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Remarks *-Specific gravity calculated from average of group.

Engineer

Date Reported December 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. Golden, Colorado
ANALYTICAL LABORATORY REPORT
6412-

Lab Group Number. 678-64
Project Number. 840703
Sponsor. Sun Oil Company

Project Engineer W. H Reeves
Date Submitted December 28, 1964

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2758 | | Hole 17, Core 12, | | 5.84 | | 5 03 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 2759 | | Hole 17, Core 12, | | 9.52 | | 6.37 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2760 | 141-149 | Hole 17, Core 13, | | 9.82 | | 7.01 | | 0.973 | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2761 | | Hole 17, Core 13, | | 6 67 | | 6.10 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2762 | 149-156 | Hole 17, Core 14, | | 3.95 | | 2.18 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2763 | 156-164 | Hole 17, Core 15, | | 7.58 | | 3.67 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 2764 | | Hole 17, Core 15, | | 6 06 | | 3 26 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 2765 | | Hole 17, Core 15, | | 3 52 | | 5 87 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 2766 | 164-171 | Hole 17, Core 16, | | 5 04 | | 3 17 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2767 | 171-179 | Hole 17, Core 17, | | 5 88 | | 3 56 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2768 | | Hole 17, Core 17, | | 7 21 | | 4.74 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2769 | 179-184 | Hole 17, Core 18, | | 8 40 | | 9 07 | | 0 967 | * | | | | | | | | | | | |

Remarks * Specific gravity-calculated from average of group.

Supervisor

Date Reported December 29, 1964

PAGE NO. 7 Golden, Colorado

Lab Group Number:

Project Engineer:

6412- ANALYTICAL LABORATORY REPORT

Project Number 840703

Sponsor: Sun Oil Company

Date Submitted December 28, 1964

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2770 | 184-191 | Hole 17, Core 19, | | 9.02 | | 8.28 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2771 | 194-201 | Hole 17, Core 20, | | 6.36 | | 6 84 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | ← Base | | | | | | | | | | |
| 2772 | 201-209 | Hole 17, Core 21, | | 5.14 | | 9.34 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2773 | | Hole 17, Core 21, | | 6.57 | | 8.52 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2774 | 209-218 | Hole 17, Core 22, | | 3 01 | | 8.76 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2775 | 218-224 | Hole 17, Core 23, | | 0 28 | | 10 1 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 2776 | | Hole 17, Core 22, | | 1.63 | | 10 8 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2777 | 224-233 | Hole 17, Core 24, | | 1.96 | | 11.3 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2778 | | Hole 17, Core 24, | | 2 56 | | 8 65 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2779 | 83-84 | Junk Sub 1 | | 4.72 | | 7 16 | | 0 967 | * | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group

Supervisor R. D. Reeves

Date Reported December 28, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 1 Golden, Colorado

657- ANALYTICAL LABORATORY REPORT Hole 18

Lab Group Number 708-65

Project Number 840703

Sponsor Sun Oil Company

Project Engineer W. H. Reeves

Date Submitted July 14, 1965

1/14-24-21W

| Lab. No. | Core Samp. No. | Description | Bag | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 954 | J Sub | Top only | 1 of 1 | | 0.00 | | 3.16 | | 0.965 | * | | | | | | | | | | | |
| 955 | 1 | Top | 1 of 1 | | Trace | | 16.5 | | 0 965 | * | | | | | | | | | | | |
| 956 | 2 | Top | 1 of 2 | | Trace | | 19.6 | | 0.965 | * | | | | | | | | | | | |
| 957 | 2 | Bottom | 1 of 2 | | 1.25 | | 14.4 | | 0.965 | * | | | | | | | | | | | |
| 958 | 3 | Bottom | 1 of 2 | | Trace | | 16.9 | | 0.965 | * | | | | | | | | | | | |
| 959 | 3 | Bottom Only | 2 of 2 | | Trace | | 17.6 | | 0.965 | * | | | | | | | | | | | |
| 960 | 4 | Bottom | 1 of 2 | | 1 19 | | 11.5 | | 0.965 | * | | | | | | | | | | | |
| 961 | 4 | Top | 2 of 2 | | 0.00 | | 12.1 | | 0.965 | * | | | | | | | | | | | |
| 962 | 5 | Top | 1 of 2 | | Trace | | 14.7 | | 0.965 | * | | | | | | | | | | | |
| 963 | 5 | Bottom | 1 of 2 | | Trace | | 13 0 | | 0.965 | * | | | | | | | | | | | |
| 964 | 6 | Top | 1 of 2 | | 2.10 | | 12.1 | | 0.965 | * | | | | | | | | | | | |
| 965 | 6 | Bottom | 1 of 2 | | 1 22 | | 16.9 | | 0.965 | * | | | | | | | | | | | |
| 966 | 7 | Bottom Only | 2 of 2 | | 0.99 | | 12.3 | | 0.965 | * | | | | | | | | | | | |
| 967 | 8 | Top | 1 of 2 | | Trace | | 13.8 | | 0.965 | * | | | | | | | | | | | |
| 968 | 8 | Bottom | 1 of 2 | | 0 32 | | 12.7 | | 0 965 | * | | | | | | | | | | | |
| 969 | 9 | Top | 1 of 2 | | 1.72 | | 11.6 | | 0.965 | * | | | | | | | | | | | |
| 970 | 9 | Bottom Only | 2 of 2 | | 2.12 | | 11.6 | | 0.965 | * | | | | | | | | | | | |
| 971 | 10 | Bottom | 1 of 2 | | Trace | | 19 7 | | 0 965 | * | | | | | | | | | | | |
| 972 | 10 | Top | 2 of 2 | | Trace | | 16 4 | | 0 965 | * | | | | | | | | | | | |
| 973 | 11 | Bottom Only | 2 of 2 | | Trace | | 20.3 | | 0 965 | * | | | | | | | | | | | |
| 974 | 12 | Bottom | 1 of 2 | | Trace | | 19 6 | | 0.965 | * | | | | | | | | | | | |
| 975 | 12 | Top only | 2 of 2 | | Trace | | 19.0 | | 0.965 | * | | | | | | | | | | | |
| 976 | 13 | Top | 1 of 1 | | 2.06 | | 14.2 | | 0.965 | * | | | | | | | | | | | |
| 977 | 14 | Bottom | 2 of 2 | | 2 47 | | 16 2 | | 0.965 | * | | | | | | | | | | | |
| 978 | 15 | Top | 1 of 2 | | 0.58 | | 16.7 | | 0.965 | * | | | | | | | | | | | |

marks * Specific gravity calculated from average of group.

pervisor C. T. Rivera

Date Reported July 15, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

GOLDEN, COLORADO

Lab Group Number 342-64

Project Number 840703

Sponsor Sun Oil Company

Sec 20-50-5 W 2nd P.M. #1 Sask

Project Engineer W. H. Reeves

Date Submitted September 10, 1964

# ANALYTICAL LABORATORY REPORT

649-

| Lab. No. | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 222 | 23-27 | Bag #1 Core #1 | | 0.62 | | 11.5 | | 0.960 | * | | | | | T.D. 219 ft | | | | | | |
| 223 | 27-35 | Bag #1 Core #2 | | 1.20 | | 7.13 | | 0.960 | * | | | | | Niobrara Top 68 ft | | | | | | |
| 224 | | " 2 " 2 | | 1.38 | | 9.18 | | 0.960 | * | | | | | | | Base 199 ft | | | | |
| 225 | 35-43 | Bag #1 Core #3 | | 0.98 | | 7.26 | | 0.960 | * | | | | | Elevation approx 1295 | | | | | | |
| 226 | | " 2 " 3 | | 1.55 | | 9.23 | | 0.960 | * | | | | | | | | | | | |
| 227 | | " 3 " 3 | | 0.85 | | 9.63 | | 0.960 | * | | | | | | | | | | | |
| 228 | 43-52 | Bag #1 Core #4 | | 1.41 | | 11.7 | | 0.960 | * | | | | | | | | | | | |
| 229 | | " 2 " 4 | | 0.34 | | 11.0 | | 0.960 | * | | | | | | | | | | | |
| 230 | 52-64 | Bag #1 Core #5 | | 3.34 | | 10.3 | | 0.960 | * | | | | | | | | | | | |
| 231 | | " 2 " 5 | | 3.18 | | 6.66 | | 0.960 | * | | | | | | | | | | | |
| 232 | | " 3 " 5 | | 8.08 | | 7.38 | | 0.960 | * | | | | | | | | | | | |
| 233 | | " 4 " 5 | | 5.09 | | 10.8 | | 0.960 | * | | | | | | | | | | | |
| 234 | 64-70 | Bag #1 Core #6 | | 3.56 | | 8.12 | | 0.960 | * | | | | | | | | | | | |
| 235 | | " 2 " 6 | | 3.78 | | 9.28 | | 0.960 | * | | | | | | | | | | | |
| 236 | | " 3 " 6 | | 7.30 | | 10.5 | | 0.960 | * | ← Top of Niobrara | | | | | | | | | | |
| 237 | | " 4 " 6 | | 11.7 | | 9.62 | | 0.955 | | | | | | | | | | | | |
| 238 | | " 5 " 6 | | 11.7 | | 8.23 | | 0.975 | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Date Reported September 14, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 1 GOLDEN, COLORADO

Lab Group Number 351-64

Project Number: 840703

Project Engineer W. H. Reeves

ANALYTICAL LABORATORY REPORT

Sponsor Sun Oil Company

Date Submitted September 14, 1964

649-

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 346 | 70-78 | Bag #1 Core #7 | | 7.38 | | 10.8 | | 0.931 | | | | | | | | | | | | |
| 347 | | " 2 " 7 | | 9.09 | | 7.51 | | 0.944 | | | | | | | | | | | | |
| 348 | | " 3 " 7 | | 10.2 | | 7.01 | | 0.966 | | | | | | | | | | | | |
| 349 | 78-86 | Bag #1 Core #8 | | 8.50 | | 8.29 | | 0.974 | | | | | | | | | | | | |
| 350 | | " 2 " 8 | | 9.45 | | 8.34 | | 0.954 | | | | | | | | | | | | |
| 351 | | " 3 " 8 | | 10.1 | | 7.44 | | 0.958 | | | | | | | | | | | | |
| 352 | | " 4 " 8 | | 10.1 | | 6.94 | | 0.968 | | | | | | | | | | | | |
| 353 | | " 5 " 8 | | 9.78 | | 7.59 | | 0.958 | | | | | | | | | | | | |
| 354 | 86-96 | Bag #1 Core #9 | | 10.1 | | 8.13 | | 0.932 | | | | | | | | | | | | |
| 355 | | " 2 " 9 | | 5.67 | | 6.21 | | 0.948 | | | | | | | | | | | | |
| 356 | | " 3 " 9 | | 8.37 | | 6.86 | | 0.985 | | | | | | | | | | | | |
| 357 | | " 4 " 9 | | 7.28 | | 7.90 | | 0.967 | | | | | | | | | | | | |
| 358 | | " 5 " 9 | | 6.90 | | 7.52 | | 0.967 | | | | | | | | | | | | |
| 359 | 96-104 | Bag #1 Core #10 | | 8.43 | | 7.50 | | 0.942 | | | | | | | | | | | | |
| 360 | | " 2 " 10 | | 8.02 | | 6.28 | | 0.965 | * | | | | | | | | | | | |
| 361 | | " 3 " 10 | | 9.82 | | 6.65 | | 0.955 | | | | | | | | | | | | |
| 362 | 104-114 | Bag #1 Core #11 | | 5.86 | | 10.1 | | 0.965 | * | | | | | | | | | | | |
| 363 | | " 2 " 11 | | 7.41 | | 9.86 | | 0.949 | | | | | | | | | | | | |
| 364 | | " 3 " 11 | | 5.64 | | 10.3 | | 0.965 | * | | | | | | | | | | | |
| 365 | | " 4 " 11 | | 5.97 | | 9.83 | | 0.963 | | | | | | | | | | | | |
| 366 | | " 5 " 11 | | 9.07 | | 7.42 | | 0.971 | | | | | | | | | | | | |
| 367 | 114-124 | Bag #1 Core #12 | | 9.20 | | 11.6 | | 0.956 | | | | | | | | | | | | |
| 368 | | " 2 " 12 | | 10.6 | | 11.4 | | 0.958 | | | | | | | | | | | | |
| 369 | | " 3 " 12 | | 8.94 | | 10.1 | | 0.991 | | | | | | | | | | | | |
| 370 | | " 4 " 12 | | 9.40 | | 11.2 | | 0.972 | | | | | | | | | | | | |

marks * Specific gravity calculated from average of group.

pervisor

Date Reported September 16, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 2 GOLDEN, COLORADO

Lab Group Number 351-64

Project Number 840703

Project Engineer W. H. Reeves

# ANALYTICAL LABORATORY REPORT

Sponsor Sun Oil Company

Date Submitted September 14, 1964

649-

| Lab. No. | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 371 | | Bag #5 Core #12 | | 10.6 | | 11.9 | | 0.966 | | | | | | | | | | | | |
| 372 | 124-134 | Bag #1 Core #13 | | 11.1 | | 10.6 | | 0.961 | | | | | | | | | | | | |
| 373 | | " 2 " 13 | | 9.27 | | 10.4 | | 0.970 | | | | | | | | | | | | |

Remarks

Supervisor

Date Reported September 16, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 1 GOLDEN, COLORADO

Lab Group Number 360-64

Project Number 840703

Project Engineer W. H. Reeves

# ANALYTICAL LABORATORY REPORT

Sponsor Sun Oil Company

Date Submitted September 15, 1964

649-

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 427 | | Bag #3 Core #13 | | 9.31 | | 8.30 | | 0.929 | | | | | | | | | | | | |
| 428 | 134-144 | Bag #1 Core #14 | | 8.58 | | 7.96 | | 0.966 | | | | | | | | | | | | |
| 429 | | " 2 " 14 | | 8.84 | | 9.07 | | 0.953 | | | | | | | | | | | | |
| 430 | | " 3 " 14 | | 8.42 | | 8.80 | | 0.970 | | | | | | | | | | | | |
| 431 | | " 4 " 14 | | 6.25 | | 9.24 | | 0.938 | | | | | | | | | | | | |
| 432 | | " 5 " 14 | | 6.90 | | 8.85 | | 0.962 | | | | | | | | | | | | |
| 433 | 144-153 | Bag #1 Core #15 | | 7.23 | | 4.41 | | 0.936 | | | | | | | | | | | | |
| 434 | | " 2 " 15 | | 5.92 | | 5.70 | | 0.962 | | | | | | | | | | | | |
| 435 | | " 3 " 15 | | 10.2 | | 9.76 | | 0.953 | | | | | | | | | | | | |
| 436 | | " 4 " 15 | | 8.94 | | 5.73 | | 0.960 | | | | | | | | | | | | |
| 437 | 154-164 | Bag #1 Core #16 | | 5.75 | | 3.94 | | 0.962 | | | | | | | | | | | | |
| 438 | | " 2 " 16 | | 7.92 | | 4.15 | | 0.962 | | | | | | | | | | | | |
| 439 | | " 3 " 16 | | 10.1 | | 3.72 | | 0.984 | | | | | | | | | | | | |
| 440 | 164-173 | Bag #1 Core #17 | | 14.6 | | 5.88 | | 0.959 | | | | | | | | | | | | |
| 441 | | " 2 " 17 | | 12.8 | | 5.39 | | 0.979 | | | | | | | | | | | | |
| 442 | | " 3 " 17 | | 12.8 | | 6.26 | | 0.974 | | | | | | | | | | | | |
| 443 | 173-181 | Bag #1 Core #18 | | 6.61 | | 3.81 | | 0.962 | | | | | | | | | | | | |
| 444 | | " 2 " 18 | | 6.70 | | 3.98 | | 0.974 | | | | | | | | | | | | |
| 445 | | " 3 " 18 | | 8.20 | | 4.12 | | 0.962 | | | | | | | | | | | | |
| 446 | | " 4 " 18 | | 8.34 | | 4.95 | | 0.975 | | | | | | | | | | | | |
| 447 | 181-189 | Bag #1 Core #19 | | 8.48 | | 3.95 | | 0.975 | | | | | | | | | | | | |
| 448 | | " 2 " 19 | | 2.47 | | 18.3 | | 0.962 | | | | | | | | | | | | |
| 449 | 189-199 | Bag #1 Core #20 | | 11.9 | | 5.27 | | 0.953 | | | | | | | | | | | | |
| 450 | | " 2 " 20 | | 13.0 | | 5.18 | | 0.948 | | | | | | | | | | | | |
| 451 | | " 3 " 20 | | 12.8 | | 7.39 | | 0.945 | | | | | | | | | | | | |

Remarks

Supervisor W. H. Reeves

Date Reported September 16, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 2 GOLDEN, COLORADO

Lab Group Number 360-64

Project Number 840703

Project Engineer W. H. Reeves

# ANALYTICAL LABORATORY REPORT

649-

Sponsor Sun Oil Company

Date Submitted September 15, 1964

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 452 | | Bag #4 Core #20 | | 11.1 | | 10.5 | | 0.959 | ← Base of Niobrara | | | | | | | | | | | |
| 453 | 199-209 | Bag #1 Core #21 | | 8.02 | | 6.77 | | 0.963 | | | | | | | | | | | | |
| 454 | | " 2 " 21 | | 6.62 | | 7.36 | | 0.954 | * | | | | | | | | | | | |
| 455 | 209-219 | Bag #1 Core #22 | | 2.92 | | 8.00 | | 0.954 | * | | | | | | | | | | | |
| 456 | | " 2 " 22 | | 3.24 | | 7.56 | | 0.954 | * | | | | | | | | | | | |
| 457 | | " 3 " 22 | | 4.22 | | 5.84 | | 0.954 | * | | | | | | | | | | | |
| 458 | | " 4 " 22 | | 2.95 | | 8.99 | | 0.954 | * | | | | | | | | | | | |
| 459 | | " 5 " 22 | | 2.11 | | 7.04 | | 0.954 | * | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Approved [signature]

Date Reported September 16, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 1 Golden, Colorado

Lab Group Number 41-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W. H Re[illegible]s
Date Submitted January 15, 1965

# ANALYTICAL LABORATORY REPORT

651-

C.H. #4. Sask

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~ 450 | -7-37 | Hole 4, Core 2, | | 9 11 | | 5 62 | | 0 969 | | | | | | Sec 4 - 44 - 2W2 | | | | | | |
| | | Bag 1 of 4 | | | | | | | | | | | | KB 1210 | | | | | | |
| 451 | | Hole 4, Core 2, | | 11 2 | | 7 92 | | 0 965 | | | | | | Depth 117' | | | | | | |
| ( | | Bag 2 of 4 | | | | | | | | | | | | Top Niobrara 11' | | | | | | |
| 452 | | Hole 4, Core 2, | | 11 1 | | 9 21 | | 0 970 | | | | | | Base 56' | | | | | | |
| | | Bag 3 of 4 | | | | | | | | | | | | | | | | | | |
| 453 | | Hole 4, Core 2, | | 10 7 | | 13 2 | | 0 958 | | | | | | | | | | | | |
| | | Bag 4 of 4 | | | | | | | | | | | | | | | | | | |
| 454 | 37-47 | Hole 4, Core 3, | | 5 26 | | 15 0 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 4 | | | | | | | | | | | | | | | | | | |
| 455 | | Hole 4, Core 3, | | 4 32 | | 12 6 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 of 4 | | | | | | | | | | | | | | | | | | |
| 456 | | Hole 4, Core 3, | | 3 63 | | 8 68 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 3 of 4 | | | | | | | | | | | | | | | | | | |
| ( ) | | Hole 4, Core 3, | | 11 2 | | 9.59 | | 0 962 | | | | | | | | | | | | |
| | | Bag 4 of 4 | | | | | | | | | | | | | | | | | | |
| 458 | 47-57 | Hole 4, Core 4, | | 5 43 | | 12 5 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 4 | | | | | | | | | | | | | | | | | | |
| 459 | | Hole 4, Core 4, | | 7 16 | | 13 2 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 of 4 | | | | | | | | | | | | | | | | | | |
| 460 | | Hole 4, Core 4, | | 5 81 | | 11 9 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 3 of 4 | | | | | | | | | | | | | | | | | | |
| 461 | | Hole 4, Core 4, | | 4 78 | | 11.7 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 4 of 4 | | | | | | | | ← base | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

emarks * Specific gravity calculated from average of group.

ipervisor

Date Reported January 15, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 1 GOLDEN, COLORADO

Lab Group Number 485-64

Project Number 840703

Project Engineer W. H. Reeves

Sponsor Sun Oil Company

Date Submitted October 27, 1964

8-53-1 W2

Core Hole #10 NEC 8-53-1 W2

# ANALYTICAL LABORATORY REPORT

6410-

| Lab No | Samp No | Description | G/T Oil | | Wt.% Oil | | G/T Water | | Wt.% Water | | Wt % Gas + Loss | | Wt% Spent Shale | | Coking Tendency | | Specific Gravity | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
| 3841 | 1 | Hole 10, Core 11, | | 7.44 | | 3.0 | | 5.72 | | 2.4 | | 2.8 | | 91.8 | | None | | 0.973 | | |
| | | 132-140, Box 2 of | | | | | | | | | | | | | | | | | | |
| | | 2, Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 3842 | 2 | Hole 10, Core 12, | | 4.77 | | 1.9 | | 6.21 | | 2.6 | | 4.4 | | 91.1 | | None | | 0.976 | * | |
| | | 140-149, Box 2 of | | | | | | | | | | | | | | | | | | |
| | | 3, Bag 2 of 4 | | | | | | | | | | | | | | | | | | |
| 3843 | 3 | Hole 10, Core 11, | | 7.24 | | 2.9 | | 5.83 | | 2.4 | | 3.2 | | 91.5 | | None | | 0.976 | * | |
| | | 132-140, Box 1 of | | | | | | | | | | | | | | | | | | |
| | | 2, Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 3844 | 4 | Hole 10, Core 11, | | 4.84 | | 2.0 | | 5.98 | | 2.5 | | 4.0 | | 91.5 | | None | | 0.976 | * | |
| | | 132-140, Box 2 of | | | | | | | | | | | | | | | | | | |
| | | 2, Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 3845 | 5 | Hole 10, Core 15, | | 12.0 | | 4.8 | | 9.18 | | 3.8 | | 4.1 | | 87.3 | | None | | 0.970 | | |
| | | 165-175, Box 1 of | | | | | | | | | | | | | | | | | | |
| | | 2, Bag 4 of 4 | | | | | | | | | | | | | | | | | | |
| 3846 | 6 | Hole 10, Core 15, | | 9.72 | | 4.0 | | 9.67 | | 4.0 | | 5.3 | | 86.7 | | None | | 0.993 | | |
| | | 165-175, Box 1 of | | | | | | | | | | | | | | | | | | |
| | | 2, Bag 3 of 4 | | | | | | | | | | | | | | | | | | |
| 3847 | 7 | Hole 10, Core 15, | | 14.7 | | 5.9 | | 8.02 | | 3.3 | | 4.5 | | 86.3 | | None | | 0.968 | | |
| | | 165-175, Box 2 of | | | | | | | | | | | | | | | | | | |
| | | 2, Bag 2 of 4 | | | | | | | | | | | | | | | | | | |
| 3848 | 8 | Hole 10, Core 15, | | 9.90 | | 4.0 | | 7.88 | | 3.3 | | 4.4 | | 88.3 | | None | | 0.986 | | |
| | | 165-175, Box 2 of | | | | | | | | | | | | | | | | | | |
| | | 2, Bag 1 of 4 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Elevation TD Logs Tops Bases Structure

Supervisor W. H. Reeves

Date Reported October 27, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 2 GOLDEN, COLORADO

Lab Group Number 485-64
Project Number 840703 Project Engineer W. H. Reeves

# ANALYTICAL LABORATORY REPORT

6410-

Sponsor Sun Oil Company Date Submitted October 27, 1964

| Lab No | Samp No | Description | G/T Oil Est | G/T Oil Fnd | Wt.% Oil Est | Wt.% Oil Fnd | G/T Water Est | G/T Water Fnd | Wt.% Water Est | Wt.% Water Fnd | Wt % Gas + Loss Est | Wt % Gas + Loss Fnd | Wt% Spent Shale Est | Wt% Spent Shale Fnd | Coking Tendency Est | Coking Tendency Fnd | Specific Gravity Est | Specific Gravity Fnd | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3849 | 9 | Hole 10, Core 13, 149-155, Box 1 of 2, Bag 4 of 4 | | 8.51 | | 3.5 | | 8.01 | | 3.3 | | 3.4 | | 89.8 | | None | | 0.971 | |
| 3850 | 10 | Hole 10, Core 13, 149-155, Box 2 of 2, Bag 1 of 4 | | 4.18 | | 1.7 | | 7.86 | | 3.3 | | 3.7 | | 91.3 | | None | | 0.976 | * |
| 3851 | 11 | Hole 10, Core 13, 149-155, Box 1 of 2, Bag 2 of 4 | | 8.09 | | 3.2 | | 6.40 | | 2.7 | | 2.8 | | 91.3 | | None | | 0.961 | |
| 3852 | 12 | Hole 10, Core 13, 149-155, Box 1 of 2, Bag 3 of 4 | | 5.60 | | 2.3 | | 7.19 | | 3.0 | | 4.1 | | 90.6 | | None | | 0.976 | * |
| 3853 | 13 | Hole 10, Core 14, 155-165, Box 2 of 2, Bag 1 of 3 | | 5.88 | | 2.4 | | 9.05 | | 3.8 | | 4.1 | | 89.7 | | None | | 0.976 | * |
| 3854 | 14 | Hole 10, Core 14, 155-165, Box 1 of 2, Bag 3 of 3 | | 14.7 | | 5.9 | | 8.42 | | 3.5 | | 4.9 | | 85.7 | | None | | 0.967 | |
| 3855 | 15 | Hole 10, Core 14, 155-165, Box 1 of 2, Bag 2 of 3 | | 8.83 | | 3.6 | | 9.22 | | 3.8 | | 4.4 | | 88.2 | | None | | 0.980 | |
| 3856 | 16 | Hole 10, Core 12, 140-149, Box 3 of 3, Bag 1 of 4 | | 7.31 | | 3.0 | | 7.08 | | 3.0 | | 3.7 | | 90.3 | | None | | 0.970 | |

emarks * Specific gravity calculated from average of group.

upervisor W. H. Reeves Date Reported October 27, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 3 GOLDEN, COLORADO

Lab Group Number 485-64

Project Number 840703 Project Engineer W. H. Reeves

ANALYTICAL LABORATORY REPORT

Sponsor Sun Oil Company Date Submitted October 27, 1964

6410-

| Lab No | Samp No | Description | G/T Oil Est | G/T Oil Fnd | Wt.% Oil Est | Wt.% Oil Fnd | G/T Water Est | G/T Water Fnd | Wt.% Water Est | Wt.% Water Fnd | Wt.% Gas + Loss Est | Wt.% Gas + Loss Fnd | Wt% Spent Shale Est | Wt% Spent Shale Fnd | Coking Tendency Est | Coking Tendency Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3857 | 17 | Hole 10, Core 12, 140-149, Box 1 of 3, Bag 4 of 4 | | 8.13 | | 3.3 | | 6.73 | | 2.8 | | 5.1 | | 88.8 | | None | | 0.967 | * | |
| 3858 | 18 | Hole 10, Core 12, 140-149, Box 1 of 3, Bag 3 of 4 | | 7.09 | | 2.9 | | 6.68 | | 2.8 | | 4.1 | | 90.2 | | None | | 0.982 | | |
| 3859 | 19 | Hole 10, Core 16, 175-185, Box 2 of 2, Bag 1 of 4 | | 12.9 | | 5.3 | | 8.79 | | 3.7 | | 4.4 | | 86.6 | | None | | 0.979 | | |
| 3860 | 20 | Hole 10, Core 16, 175-185, Box 1 of 2, Bag 4 of 4 | | 15.5 | | 6.3 | | 10.6 | | 4.4 | | 5.0 | | 84.3 | | None | | 0.981 | | |
| 3861 | 21 | Hole 10, Core 16, 175-185, Box 2 of 2, Bag 2 of 4 | | 12.1 | | 4.9 | | 8.31 | | 3.5 | | 4.0 | | 87.6 | | None | | 0.972 | | |
| 3862 | 22 | Hole 10, Core 16, 175-185, Box 1 of 2, Bag 3 of 4 | | 12.1 | | 4.9 | | 10.1 | | 4.2 | | 4.8 | | 86.1 | | None | | 0.975 | | |
| 3863 | 23 | Hole 10, Core 26, 254-257, Box 1 of 1, Bag 1 of 1 | | 0 27 | | 0.1 | | 6.63 | | 2.8 | | 2.0 | | 95.1 | | None | | 0.976 | * | |
| 3864 | 24 | Hole 10, Core 22, 218-228, Box 1 of 1, Bag 2 of 2 | | 6.78 | | 2.8 | | 3.92 | | 1.6 | | 3.7 | | 91.9 | | None | | 0.976 | * | |

Remarks * Specific gravity calculated from average of group.

Supervisor W. H. Reeves Date Reported October 27. 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 4 GOLDEN, COLORADO

Lab Group Number 485-64

Project Number 840703 Project Engineer W. H. Reeves

ANALYTICAL LABORATORY REPORT

6410-

Sponsor Sun Oil Company Date Submitted October 27, 1964

| Lab. No | Samp No | Description | G/T Oil | | Wt.% Oil | | G/T Water | | Wt.% Water | | Wt.% Gas + Loss | | Wt% Spent Shale | | Coking Tendency | | Specific Gravity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | |
| 3865 | 25 | Hole 10, Core 22, 218-228, Box 1 of 1, Bag 1 of 2 | | 6.22 | | 2.5 | | 4.25 | | 1.8 | | 5.1 | | 90.6 | | None | | 0.976 | * |
| 3866 | 26 | Hole 10, Core 24, 234-244, Box 1 of 1, Bag 1 of 2 | | 3.39 | | 1.4 | | 6.61 | | 2.8 | | 3.7 | | 92.1 | | None | | 0.976 | * |
| 3867 | 27 | Hole 10, Core 24, 234-244, Box 1 of 1, Bag 2 of 2 | | 3.53 | | 1.4 | | 4.69 | | 2.0 | | 3.3 | | 93.3 | | None | | 0.976 | * |
| 3868 | 28 | Hole 10, Core 25, 244-254, Box 1 of 1, Bag 1 of 2 | | 2.78 | | 1.1 | | 5.18 | | 2.2 | | 3.0 | | 93.7 | | None | | 0.976 | * |
| 3869 | 29 | Hole 10, Core 25 244-254, Box 1 of 1, Bag 2 of 2 | | 0.54 | | 0.2 | | 2.96 | | 1.2 | | 2.4 | | 96.2 | | None | | 0.976 | * |
| 3870 | 30 | Hole 10, Core 21, 208-218, Box 1 of 2, Bag 2 of 2 | | 7.58 | | 3.1 | | 4.53 | | 1.9 | | 2.8 | | 92.2 | | None | | 0.969 | |
| 3871 | 31 | Hole 10, Core 19, 200-204, Box 1 of 1, Bag 1 of 1 | | 11.8 | | 4.8 | | 7.38 | | 3.1 | | 3.9 | | 88.2 | | None | | 0.977 | |
| 3872 | 32 | Hole 10, Core 21, 208-218, Box 2 of 2, Bag 1 of 2 | | 6.20 | | 2.5 | | 5.05 | | 2.1 | | 2.7 | | 92.7 | | None | | 0.968 | |

Remarks * Specific gravity calculated from average of group.

Supervisor W. H. Reeves Date Reported October 27, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
GOLDEN, COLORADO

Lab Group Number 485-64

Project Number 840703 Project Engineer W. H. Reeves

ANALYTICAL LABORATORY REPORT

Sponsor Sun Oil Company Date Submitted October 27, 1964

6410-

| Lab No | Samp No | Description | G/T Oil Est | G/T Oil Fnd | Wt.% Oil Est | Wt.% Oil Fnd | G/T Water Est | G/T Water Fnd | Wt.% Water Est | Wt.% Water Fnd | Wt.% Gas + Loss Est | Wt.% Gas + Loss Fnd | Wt% Spent Shale Est | Wt% Spent Shale Fnd | Coking Tendency Est | Coking Tendency Fnd | Specific Gravity Est | Specific Gravity Fnd | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3873 | 33 | Hole 10, Core 18, 195-200, Box 1 of 1, Bag 1 of 1 | | 13.1 | | 5.3 | | 5.93 | | 2.5 | | 3.5 | | 88.7 | | None | | 0.973 | |
| 3874 | 34 | Hole 10, Core 20, 204-208, Box 1 of 1, Bag 1 of 1 | | 6.95 | | 2.8 | | 5.89 | | 2.5 | | 2.6 | | 92.1 | | None | | 0.975 | |
| 3875 | 35 | Hole 10, Core 17, 185-195, Box 1 of 2, Bag 2 of 3 | | 7.76 | | 3.2 | | 5.31 | | 2.2 | | 2.7 | | 91.9 | | None | | 0.989 | |
| 3876 | 36 | Hole 10, Core 17, 185-195, Box 2 of 2, Bag 1 of 3 | | 11.8 | | 4.9 | | 5.33 | | 2.2 | | 3.3 | | 89.6 | | None | | 0.996 | |
| 3877 | 37 | CH#10, Core 17, 185-195, Box 1 of 2, Bag 3 of 3 | | 10.8 | | 4.4 | | 4.74 | | 2.0 | | 1.4 | | 92.2 | | None | | 0.976 | |
| 3878 | 38 | Manitoba Dug-Out Sample | | 1.69 | | 0.7 | | 4.79 | | 2.0 | | 3.4 | | 93.9 | | None | | 0.976 | * |

Remarks * Specific gravity calculated from average of group.

Supervisor W. H. Reeves Date Reported October 27, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 1 Golden, Colorado
ANALYTICAL LABORATORY REPORT
652-

Lab Group Number: 111-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer: W H Reeves
Date Submitted February 1965
C H #10A - Sask

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 247 | 191-195 | Hole 10A, Core 1, | | 11 8 | | 9.46 | | 0.972 | | | | | | Sec | 8-5 | 3-1W | 2 | | | |
| | | Bag 1 | | | | | | | | | | | | KB | 1400 | | | | | |
| 248 | 195-200 | Hole 10A, Core 2, | | 9 77 | | 12 1 | | 0 966 | | | | | | Depth | 260' | | | | | |
| | | Bag 1 | | | | | | | | | | | | Top Niobrara | | | - | | | |
| 249 | | Hole 10A, Core 2, | | 9 48 | | 8 00 | | 0 973 | | | | | | Base | | | 250 | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 250 | 200-205 | Hole 10A, Core 3, | | 9 99 | | 9 30 | | 0 973 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 251 | 205-210 | Hole 10A, Core 4, | | 7.25 | | 8 46 | | 0 975 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 252 | | Hole 10A, Core 4, | | 6 23 | | 6.97 | | 0 976 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 253 | | Hole 10A, Core 4, | | 8 04 | | 6.49 | | 0 970 | | | | | | | | | | | | |
| | | Bag 3 | | | | | | | | | | | | | | | | | | |
| 254 | 210-215 | Hole 10A, Core 5, | | 7 90 | | 5.44 | | 0 957 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 255 | 215 220 | Hole 10A, Core 6, | | 9 38 | | 6 46 | | 0 965 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 256 | 220-225 | Hole 10A, Core 7, | | 11 0 | | 9 41 | | 0 961 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 257 | | Hole 10A, Core 7, | | 8 92 | | 5.56 | | 0 965 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 258 | 225-230 | Hole 10A, Core 8, | | 9 17 | | 9.64 | | 0 953 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Remarks

Supervisor W H Reeves

Date Reported February 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 2 Golden, Colorado

ANALYTICAL LABORATORY REPORT

652-

Lab Group Number 111-65

Project Number 840703

Sponsor Sun Oil Company

Project Engineer: W. H Reeves

Date Submitted February 5, 1965

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 259 | 230-235 | Hole 10A, Core 9, | | 5 50 | | 8 83 | | 0 962 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 260 | 235-240 | Hole 10A, Core 10, | | 4 41 | | 7 96 | | 0 962 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 261 | 240-245 | Hole 10A, Core 11, | | 2 89 | | 8 58 | | 0 962 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | ← | | base | 243 | | | | | | | | | |
| 262 | 245-250 | Hole 10A, Core 12, | | 0 42 | | 4 61 | | 0 962 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 263 | 250-255 | Hole 10A, Core 13, | | 0.0 | | 2 62 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 264 | 255-260 | Hole 10A, Core 14, | | 0.0 | | 10 8 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 265 | 93-98 | Hole 11, Core 3, | | 0 0 | | 3 50 | | --- | | | | | Sec 15-52-1W2 | | | | | | | |
| | | Bag 1 | | | | | | | | | | | IB 1245 | | | | | | | |
| 266 | 98-105 | Hole 11, Core 4, | | 0.0 | | 10 8 | | --- | | | | | Depth 168' | | | | | | | |
| | | Bag 1 | | | | | | | | | | | No Niobrara | | | | | | | |
| 267 | | Hole 11, Core 4, | | 0 0 | | 9.71 | | --- | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 268 | 105-112 | Hole 11, Core 5, | | 0 0 | | 10 5 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 269 | 112-113 | Hole 11, Core 6, | | 0.0 | | 7 14 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 270 | 113-119 | Hole 11, Core 7, | | 0 0 | | 10 7 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor W. H. Reeves

Date Reported February 8, 1965

[redacted]LDO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 2 Golden, Colorado

652- ANALYTICAL LABORATORY REPORT

Lab Group Number: 111-65

Project Number: 840703

Sponsor. Sun Oil Company

Project Engineer: W. H. Re[redacted]es

Date Submitted February 5, 1965

C. H. #11 - Sask

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 259 | 230-235 | Hole 10A, Core 9, | | 5.50 | | 8 83 | | 0 962 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 260 | 235-240 | Hole 10A, Core 10, | | 4 41 | | 7 96 | | 0 962 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 261 | 240-245 | Hole 10A, Core 11, | | 2 89 | | 8 58 | | 0.962 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | ← | | base | 243 | | | | | | | | | |
| 262 | 245-250 | Hole 10A, Core 12, | | 0.42 | | 4 61 | | 0 962 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 263 | 250-255 | Hole 10A, Core 13, | | 0 0 | | 2.62 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 264 | 255-260 | Hole 10A, Core 14, | | 0.0 | | 10.8 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 265 | 92-98 | Hole 11, Core 3, | | 0 0 | | 3.50 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 266 | 98 105 | Hole 11, Core 4, | | 0.0 | | 10 8 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 267 | | Hole 11, Core 4, | | 0.0 | | 9.71 | | --- | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 268 | 105 112 | Hole 11, Core 5, | | 0.0 | | 10.5 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 269 | 112-113 | Hole 11, Core 6, | | 0.0 | | 7.14 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 270 | 113-119 | Hole 11, Core 7, | | 0 0 | | 10 7 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |

Sec 15-52-1W2
KB 1245
Depth 168'
No Niobrara

Remarks * Specific gravity calculated from average of group.

Supervisor [signature]

Date Reported February 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO: 3
Golden, Colorado

Lab Group Number 111-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H. Reeves
Date Submitted February 5, 1965

# ANALYTICAL LABORATORY REPORT

652-

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 271 | 119-126 | Hole 11, Core 8, | | Trace | | 9 25 | | 0 962 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 272 | | Hole 11, Core 8, | | Trace | | 8 56 | | 0 962 | * | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 273 | 126-134 | Hole 11, Core 9, | | Trace | | 9 51 | | 0 962 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 274 | | Hole 11, Core 9, | | Trace | | 8 54 | | 0.962 | * | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 275 | 134-141 | Hole 11, Core 10, | | 0 0 | | 7.24 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 276 | 141-147 | Hole 11, Core 11, | | 0.0 | | 9 13 | | --- | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 277 | | Hole 11, Core 11, | | 0.21 | | 8 85 | | 0.962 | * | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 278 | | Hole 11, Core 11, | | 0 22 | | 9 25 | | 0.962 | * | | | | | | | | | | | |
| | | Bag 3 | | | | | | | | | | | | | | | | | | |
| 279 | 153-161 | Hole 11, Core 12, | | 0.20 | | 8 49 | | 0 970 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 280 | | Hole 11, Core 12, | | 0 20 | | 7 63 | | 0 970 | * | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 281 | | Hole 11, Core 12, | | Trace | | 8.70 | | 0.970 | * | | | | | | | | | | | |
| | | Bag 3 | | | | | | | | | | | | | | | | | | |
| 282 | | Hole 11, Core JT | | 1.40 | | 10 2 | | 0 970 | * | | | | | | | | | | | |
| | | Sub, Bag 1 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor W H Reeves

Date Reported February 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 2 Golden, Colorado

Lab Group Number 41-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H Reeves
Date Submitted January 15, 1965

C. H #12

# ANALYTICAL LABORATORY REPORT

651-

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 462 | 13-18 | Hole 12, Core 1, | | 6 24 | | 3 92 | | 0 967 | * | | | | | Sec | 9-4 | 4-2W | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | KB | 1210' | | | | | | | |
| 463 | | Hole 12, Core 1, | | 8 24 | | 4 56 | | 0 967 | * | | | | | Top | Niobrara | | 11' | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | Base | | | 55' | | | | | |
| 464 | 18-23' | Hole 12, Core 2, | | 9 15 | | 4 76 | | 0 967 | * | | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | | | |
| 465 | | Hole 12, Core 2, | | 9.32 | | 5 03 | | 0 971 | | | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | | | |
| 466 | 23-28 | Hole 12, Core 3, | | 9 59 | | 7 33 | | 0 965 | | | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | | | |
| 467 | | Hole 12, Core 3, | | 10 8 | | 6 13 | | 0 969 | | | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | | | |
| 468 | 28-36 | Hole 12, Core 4, | | 9.04 | | 5 18 | | 0 969 | | | | | | | | | | | | | | |
| | | Bag 1 of 8 | | | | | | | | | | | | | | | | | | | | |
| | | Hole 12, Core 4, | | 10 8 | | 7 88 | | 0.970 | | | | | | | | | | | | | | |
| | | Bag 2 of 8 | | | | | | | | | | | | | | | | | | | | |
| 470 | | Hole 12, Core 4, | | 11.7 | | 8 35 | | 0 966 | | | | | | | | | | | | | | |
| | | Bag 3 of 8 | | | | | | | | | | | | | | | | | | | | |
| 471 | | Hole 12, Core 4, | | 12 3 | | 8 28 | | 0 966 | | | | | | | | | | | | | | |
| | | Bag 4 of 8 | | | | | | | | | | | | | | | | | | | | |
| 472 | | Hole 12, Core 4, | | 11.0 | | 6 75 | | 0 962 | | | | | | | | | | | | | | |
| | | Bag 5 of 8 | | | | | | | | | | | | | | | | | | | | |
| 473 | | Hole 12, Core 4, | | 12 1 | | 6 47 | | 0 969 | | | | | | | | | | | | | | |
| | | Bag 6 of 8 | | | | | | | | | | | | | | | | | | | | |

emarks * Specific gravity calculated from average of group

upervisor

Date Reported January 15, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 3 Golden, Colorado

Lab Group Number 41-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H Reeves
Date Submitted January 15, 1965

# ANALYTICAL LABORATORY REPORT

651-

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 474 | | Hole 12, Core 4, | | 11 7 | | 7 49 | | 0 974 | | | | | | | | | | | | |
| | | Bag 7 of 8 | | | | | | | | | | | | | | | | | | |
| 475 | | Hole 12, Core 4, | | 8.44 | | 10 3 | | 0 965 | | | | | | | | | | | | |
| | | Bag 8 of 8 | | | | | | | | | | | | | | | | | | |
| 476 | 36-44 | Hole 12, Core 5, | | 6 54 | | 9 05 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 477 | 44-51 | Hole 12, Core 6, | | 5 34 | | 10 7 | | 0.967 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor

Date Reported January 15, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 1 Golden, Colorado

# ANALYTICAL LABORATORY REPORT

651-

Lab Group Number 13-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H Reeves
Date Submitted January 7, 1965

C.H #22

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 211 | 51-53 | Hole 22, Core 1, | | Trace | | 7 15 | | 0 958 | * | | | | | Sec | 20 | 45-4 | W2 | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | KB | | 1385' | | | | |
| 212 | 53-56 | Hole 22, Core 2, | | Trace | | 7 52 | | 0 958 | * | | | | | Depth | | 209' | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | Top Niobrara | | 104' | | | | |
| 213 | 56 59 | Hole 22, Core 3, | | 0 00 | | 8 41 | | --- | | | | | | Base | | 261' | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 214 | | Hole 22, Core 3, | | 0.00 | | 7 57 | | --- | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 215 | 59-66 | Hole 22, Core 4, | | Trace | | 7 39 | | 0 958 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 216 | 66-74 | Hole 22, Core 5, | | Trace | | 7 23 | | 0 958 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 217 | | Hole 22, Core 5, | | Trace | | 6.73 | | 0.958 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 2 | 74-81 | Hole 22, Core 6, | | Trace | | 6.35 | | 0.958 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 219 | 81-89 | Hole 22, Core 7, | | Trace | | 7 33 | | 0 958 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 220 | 89-96 | Hole 22, Core 8, | | 0.00 | | 6.91 | | --- | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 221 | | Hole 22, Core 8, | | Trace | | 7.20 | | 0.958 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 222 | 96-104 | Hole 22, Core 9, | | Trace | | 7.11 | | 0.958 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor

Date Reported January 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 2
Golden, Colorado

ANALYTICAL LABORATORY REPORT

651-

Lab Group Number 13-65
Project Number 840703
Sponsor: Sun Oil Company

Project Engineer: W H Re[illegible]s
Date Submitted January 7, 1965

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 223 | 104 111 | Hole 22, Core 10, | | 1.92 | | 8 15 | | 0 958 | * | ← | | Top | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 224 | 111-119 | Hole 22, Core 11, | | 4 73 | | 7.07 | | 0.958 | * | | | | | | | | | | | |
| ( | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 225 | 119-12( | Hole 22, Core 12, | | 7 54 | | 8 67 | | 0 953 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 226 | | Hole 22, Core 12, | | 8 23 | | 7 60 | | 0 959 | | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 227 | | Hole 22, Core 12, | | 8 25 | | 6 86 | | 0.963 | | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 228 | | Hole 22, Core 12, | | 7 25 | | 5.74 | | 0 957 | | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 229 | 126-134 | Hole 22, Core 13 | | 4.21 | | 9 12 | | 0 958 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 2( ) | | Hole 22, Core 13, | | 6 48 | | 6.75 | | 0.958 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 231 | 134-14[illegible] | Hole 22, Core 14, | | 7 05 | | 8 52 | | 0 959 | | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 232 | | Hole 22, Core 14, | | 6 38 | | 5.29 | | 0.961 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 233 | 141-149 | Hole 22, Core 15, | | 6.89 | | 5.77 | | 0 961 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 234 | | Hole 22, Core 15, | | 6 00 | | 7 58 | | 0.961 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor [signature]

Date Reported January 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO 3 Golden, Colorado
651- ANALYTICAL LABORATORY REPORT

Lab Group Number 13-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H Reeves
Date Submitted January 7, 1965

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 235 | 149-156 | Hole 22, Core 16, | | 5 15 | | 8 66 | | 0 961 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 236 | 156-164 | Hole 22, Core 17, | | 5 12 | | 6 95 | | 0 961 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 237 | | Hole 22, Core 17, | | 6.56 | | 6 59 | | 0 961 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 238 | | Hole 22, Core 17, | | 5.82 | | 6 46 | | 0 961 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 239 | 164 171 | Hole 22, Core 18, | | 6 14 | | 7 85 | | 0 961 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 240 | 171-179 | Hole 22, Core 19, | | 7 87 | | 5 75 | | 0.961 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 241 | | Hole 22, Core 19, | | 7.79 | | 5.99 | | 0 954 | | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 242 | | Hole 22, Core 19, | | 6 44 | | 4 71 | | 0.961 | * | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 243 | 179-186 | Hole 22, Core 20, | | 7 69 | | 7 40 | | 0 961 | * | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 244 | | Hole 22, Core 20, | | 10 7 | | 6 54 | | 0 965 | | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 245 | | Hole 22, Core 20, | | 8.98 | | 4 43 | | 0.957 | | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 246 | 186-194 | Hole 22, Core 21, | | 7 22 | | 6 93 | | 0 961 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor W H Reeves

Date Reported January 11, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO 4 Golden, Colorado

ANALYTICAL LABORATORY REPORT

651-

Lab Group Number 13-65

Project Number 840703

Sponsor Sun Oil Company

Project Engineer W H Reeves

Date Submitted January 7, 1965

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 247 | | Hole 22, Core 21, | | 7 84 | | 6 44 | | 0 958 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| 248 | 194-201 | Hole 22, Core 22, | | 13 0 | | 8 39 | | 0 966 | | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 249 | | Hole 22, Core 22, | | 13 5 | | 6 35 | | 0 962 | | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 250 | | Hole 22, Core 22, | | 6.16 | | 4 31 | | 0 966 | | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 251 | 201-209 | Hole 22, Core 23, | | 5 19 | | 4 75 | | 0 952 | | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 252 | | Hole 22, Core 23, | | 4 10 | | 3 12 | | 0 961 | * | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 253 | | Hole 22, Core 23, | | 6.79 | | 4 38 | | 0 967 | | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 254 | 209-216 | Hole 22, Core 24, | | 12 5 | | 9 46 | | 0.969 | | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 255 | | Hole 22, Core 24, | | 7.22 | | 5 28 | | 0 963 | | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 256 | | Hole 22, Core 24, | | 8 82 | | 6 44 | | 0.973 | | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 257 | 216-224 | Hole 22, Core 25, | | 3 86 | | 2 95 | | 0 970 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 258 | | Hole 22, Core 25, | | 6 78 | | 4 41 | | 0 975 | | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor W H Reeves

Date Reported January 11, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 5 Golden, Colorado
ANALYTICAL LABORATORY REPORT

Lab Group Number 13-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W H Reeves
Date Submitted January 7, 1965

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 259 | 224-231 | Hole 22, Core 26, | | 8 06 | | 5 18 | | 0 966 | | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 260 | 231-239 | Hole 22, Core 27, | | 6 24 | | 2 81 | | 0.973 | | | | | | | | | | | | |
| | | Bag 1 of 4 | | | | | | | | | | | | | | | | | | |
| 261 | | Hole 22, Core 27, | | 6.51 | | 2 81 | | 0.970 | * | | | | | | | | | | | |
| | | Bag 2 of 4 | | | | | | | | | | | | | | | | | | |
| 262 | | Hole 22, Core 27, | | 6 41 | | 3 01 | | 0.975 | | | | | | | | | | | | |
| | | Bag 3 of 4 | | | | | | | | | | | | | | | | | | |
| 263 | | Hole 22, Core 27, | | 7 23 | | 3.52 | | 0 975 | | | | | | | | | | | | |
| | | Bag 4 of 4 | | | | | | | | | | | | | | | | | | |
| 264 | 239-246 | Hole 22, Core 28, | | 5 06 | | 4.45 | | 0 970 | * | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | | | | | | | | | | | | |
| 265 | 246-254 | Hole 22, Core 29, | | 12 0 | | 5 69 | | 0 970 | | | | | | | | | | | | |
| | | Bag 1 of 3 | | | | | | | | | | | | | | | | | | |
| 266 | | Hole 22, Core 29, | | 7 72 | | 5.49 | | 0.972 | | | | | | | | | | | | |
| | | Bag 2 of 3 | | | | | | | | | | | | | | | | | | |
| 267 | | Hole 22, Core 29, | | 7.53 | | 6.41 | | 0.959 | | | | | | | | | | | | |
| | | Bag 3 of 3 | | | | | | | | | | | | | | | | | | |
| 268 | 254-261 | Hole 22, Core 30, | | 4.45 | | 6.62 | | 0 970 | | | | | | | | | | | | |
| | | Bag 1 of 1 | | | | | | | ← Base | | | | | | | | | | | |
| 269 | 261-269 | Hole 22, Core 31, | | 0.68 | | 5 07 | | 0 970 | * | | | | | | | | | | | |
| | | Bag 1 of 2 | | | | | | | | | | | | | | | | | | |
| 270 | | Hole 22, Core 31, | | 0.89 | | 6 32 | | 0.970 | * | | | | | | | | | | | |
| | | Bag 2 of 2 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor W H Reeves

Date Reported January 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
Golden, Colorado

PAGE NO. 5

ANALYTICAL LABORATORY REPORT

652-

Lab Group Number: 111-65
Project Number: 840703
Sponsor: Sun Oil Company

Project Engineer: W. H. Reeves
Date Submitted: February 5, 1965

C. H #27 Sask.

| Lab. No. | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 295 | 94-101 | Hole 19A, Core 11, | | 1.23 | | 9 78 | | 0 956 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 296 | | Hole 19A, Core 11, | | 0 0 | | 12 5 | | --- | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | ← Top -83 | | | | | | | | | | | |
| 297 | 81-89 | Hole 27, Core 7, | | 11 1 | | 7 35 | | 0.962 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 298 | 89-96 | Hole 27, Core 8, | | 9.52 | | 6 20 | | 0.958 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 299 | 96-104 | Hole 27, Core 9, | | 9.12 | | 6.71 | | 0.957 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 300 | | Hole 27, Core 9, | | 10.7 | | 6.37 | | 0.956 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 301 | 104-111 | Hole 27, Core 10, | | 7.78 | | 7 06 | | 0.956 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 302 | 115 119 | Hole 27, Core 12, | | 8 48 | | 7.30 | | 0.953 | | | | | | | | | | | | |
| | . | Bag 1 | | | | | | | | | | | | | | | | | | |
| 303 | 119-126 | Hole 27, Core 13, | | 7 32 | | 9.75 | | 0.957 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 304 | 126-134 | Hole 27, Core 14, | | 6 69 | | 13 9 | | 0.952 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 305 | | Hole 27, Core 14, | | 5.13 | | 10.8 | | 0.943 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 306 | 134-141 | Hole 27, Core 15, | | 7 28 | | 6.92 | | 0.950 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |

Sec 15-48-11W2
KB 1250
Depth 186'
Top Niobrara 82'
Base " 160'

Remarks: * Specific gravity calculated from average of group.

Supervisor: [signature]

Date Reported: February 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 6 Golden, Colorado

652- ANALYTICAL LABORATORY REPORT

Lab Group Number: 111-65

Project Number 840703

Sponsor Sun Oil Company

Project Engineer: W. H. Reeves

Date Submitted February 5, 1965

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 307 | | Hole 27, Core 15, | | 7.96 | | 5 36 | | 0.959 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 308 | 141-149 | Hole 27, Core 16, | | 6 02 | | 3.74 | | 0 966 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 309 | | Hole 27, Core 16, | | 7 74 | | 3.28 | | 0.960 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 310 | | Hole 27, Core 16, | | 9 54 | | 3.51 | | 0 957 | | | | | | | | | | | | |
| | | Bag 3 | | | | | | | | | | | | | | | | | | |
| 311 | 149-156 | Hole 27, Core 17, | | 9.56 | | 4 36 | | 0.963 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 312 | 156-164 | Hole 27, Core 18, | | 11.8 | | 5 61 | | 0.972 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 313 | 164-171 | Hole 27, Core 19, | | 8 10 | | 9 43 | | 0 966 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 314 | | Hole 27, Core 19, | | 7 64 | | 8 77 | | 0.967 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 315 | 171-179 | Hole 27, Core 20, | | 4 60 | | 9 15 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | ← | base | 173' | | | | | | | | | |
| 316 | | Hole 27, Core 20, | | 2.21 | | 9 22 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 317 | | Hole 27, Core 20, | | 2 24 | | 8 25 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 3 | | | | | | | | | | | | | | | | | | |
| 318 | 179-186 | Hole 27, Core 21, | | 0 45 | | 7 85 | | 0 967 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

emarks * Specific gravity calculated from average of group.

pervisor W. H. Reeves

Date Reported February 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 7 Golden, Colorado

Lab Group Number: 111-65
Project Number: 840703
Sponsor: Sun Oil Company

Project Engineer: W. H Reeves
Date Submitted February 5, 1965

## ANALYTICAL LABORATORY REPORT

652-

| Lab. No | Samp. No. | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | Hole 27, 179-186, | | 0.62 | | 10 6 | | 0 967 | * | | | | | | | | | | | |
| | | Gunk from Bartan | | | | | | | | | | | | | | | | | | |
| 320 | | Hole 28, Core 28, | | 4 19 | | 11 0 | | 0.967 | * | | | | | | | | | | | |
| | | 269-277 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor W. H Reeves

Date Reported February 8, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 1 Golden, Colorado

652- ANALYTICAL LABORATORY REPORT

Lab Group Number 155-65

Project Number 840703

Sponsor Sun Oil Company

Project Engineer. W H Reeves

Date Submitted February 17, 1965

C.H #28

#28 NEC 21-47-11 W 2nd tank

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 797 | ~~179-87~~ 179-87 | Hole 28, Core 16, Bag 1 | | 0 52 | | 11.4 | | 0 964 | * | | | | | TD | 3 14 | Niobrara Top Base Elevation 1350 | | | | |
| 798 | | Hole 28, Core 16, Bag 2 | | 0 63 | | 7 81 | | 0.964 | * | | | | | | | | | | | |
| 799 | 187-194 | Hole 28, Core 17, Bag 1 | | None | | 7 16 | | --- | | | | | | | | | | | | |
| 800 | | Hole 28, Core 17, Bag 2 | | Trace | | 7 55 | | 0.964 | * | | | | | | | | | | | |
| 801 | 194-202 | Hole 28, Core 18, Bag 1 | | 1 62 | | 8 88 | | 0 964 | * | | | | | | | | | | | |
| 802 | 202-209 | Hole 28, Core 19, Bag 1 | | 7 93 | | 9.75 | | 0.964 | | | | | | | | # | | | | |
| 803 | | Hole 28, Core 19, Bag 2 | | 8.23 | | 8 72 | | 0 961 | | | | | | | | | | | | |
| 804 | | Hole 28, Core 19, Bag 3 | | 7 75 | | 8.87 | | 0.960 | | | | | | | | | | | | |
| 805 | 209-217 | Hole 28, Core 20, Bag 1 | | 6 98 | | 8 59 | | 0.954 | | | | | | | | | | | | |
| 806 | | Hole 28, Core 20, Bag 2 | | 5 34 | | 8 13 | | 0.964 | * | | | | | | | | | | | |
| 807 | 217-224 | Hole 28, Core 21, Bag 1 | | 10 2 | | 5 05 | | 0.964 | | | | | | | | | | | | |
| 808 | | Hole 28, Core 21, Bag 2 | | 11 3 | | 5 35 | | 0.968 | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor W H Reeves

Date Reported February 18, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 2 Golden, Colorado

652- ANALYTICAL LABORATORY REPORT

Lab Group Number 155-65

Project Number 840703

Sponsor Sun Oil Company

Project Engineer W H Reeves

Date Submitted February 17, 1965

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 809 | 224-232 | Hole 28, Core 22, Bag 1 | | 8.58 | | 6 39 | | 0 962 | | | | | | | | | | | | |
| 810 | | Hole 28, Core 22, Bag 2 | | 8 38 | | 6 89 | | 0 954 | | | | | | | | | | | | |
| 811 | 232-239 | Hole 28, Core 23, Bag 1 | | 7.22 | | 6.65 | | 0 952 | | | | | | | | | | | | |
| 812 | | Hole 28, Core 23, Bag 2 | | 8 89 | | 6 91 | | 0 955 | | | | | | | | | | | | |
| 813 | | Hole 28, Core 23, Bag 3 | | 8 67 | | 6 93 | | 0.954 | | | | | | | | | | | | |
| 814 | 239-247 | Hole 28, Core 24, Bag 1 | | 7 94 | | 8 10 | | 0.952 | | | | | | | | | | | | |
| 815 | | Hole 28, Core 24, Bag 2 | | 7 98 | | 8.28 | | 0.970 | | | | | | | | | | | | |
| 816 | | Hole 28, Core 24, Bag 3 | | 7 99 | | 8 71 | | 0.953 | | | | | | | | | | | | |
| 817 | | Hole 28, Core 24, Bag 4 | | 9 22 | | 7 32 | | 0.952 | | | | | | | | | | | | |
| 818 | 247-254 | Hole 28, Core 25, Bag 1 | | 10.2 | | 8.75 | | 0.961 | | | | | | | | | | | | |
| 819 | | Hole 28, Core 25, Bag 2 | | 8.02 | | 9.12 | | 0.959 | | | | | | | | | | | | |
| 820 | | Hole 28, Core 25, Bag 3 | | 8.35 | | 7 59 | | 0.961 | | | | | | | | | | | | |

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upervisor W H Reeves

Date Reported February 18, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 3 Golden, Colorado
652- ANALYTICAL LABORATORY REPORT

Lab Group Number 155-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer: W H Reeves
Date Submitted February 17, 1965

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 821 | 254-262 | Hole 28, Core 26, | | 7.17 | | 7.19 | | 0 964 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 822 | | Hole 28, Core 26, | | 5.90 | | 10 1 | | 0.964 | * | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 823 | | Hole 28, Core 26, | | 4 79 | | 10.8 | | 0.964 | * | | | | | | | | | | | |
| | | Bag 3 | | | | | | | | | | | | | | | | | | |
| 824 | | Hole 28, Core 26, | | 4.99 | | 9 64 | | 0.964 | * | | | | | | | | | | | |
| | | Bag 4 | | | | | | | | | | | | | | | | | | |
| 825 | | Hole 28, Core 26, | | 2.69 | | 13.0 | | 0.964 | * | | | | | | | | | | | |
| | | Bag 5 | | | | | | | | | | | | | | | | | | |
| 826 | 262-269 | Hole 28, Core 27, | | Trace | | 12.5 | | 0.964 | * | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 827 | | Hole 28, Core 27, | | Trace | | 10 8 | | 0 964 | * | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 828 | | Hole 28, Core 27, | | 2.87 | | 4.94 | | 0.964 | * | | | | | | | | | | | |
| | | Bag 3 | | | | | | | | | | | | | | | | | | |
| 829 | 269-277 | Hole 28, Core 28, | | 11 1 | | 6 04 | | 0 978 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 830 | | Hole 28, Core 28, | | 11.7 | | 7 59 | | 0.974 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |
| 831 | 277-284 | Hole 28, Core 29, | | 5 57 | | 3.38 | | 0.975 | | | | | | | | | | | | |
| | | Bag 1 | | | | | | | | | | | | | | | | | | |
| 832 | | Hole 28, Core 29, | | 6 09 | | 3.84 | | 0.977 | | | | | | | | | | | | |
| | | Bag 2 | | | | | | | | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor W H Reeves

Date Reported February 18, 1965

ANALYTICAL LABORATORY REPORT

652-

Lab Group Number 155-65
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W. H Reeves
Date Submitted February 17, 1965

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 833 | 284-292 | Hole 28, Core 30, Bag 1 | | 7.78 | | 4 16 | | 0 974 | | | | | | | | | | | | |
| 834 | | Hole 28, Core 30, Bag 2 | | 8 79 | | 5.39 | | 0 974 | | | | | | | | | | | | |
| 835 | | Hole 28, Core 30, Bag 3 | | 10 3 | | 5 68 | | 0 968 | | | | | | | | | | | | |
| 836 | | Hole 28, Core 30, Bag 4 | | 9.88 | | 5 33 | | 0.970 | | | | | | | | | | | | |
| 837 | 292-299 | Hole 28, Core 31, Bag 1 | | 10.8 | | 6.58 | | 0.966 | | | | | | | | | | | | |
| 838 | | Hole 28, Core 31, Bag 2 | | 10.5 | | 6 95 | | 0 969 | | | | | | | | | | | | |
| 839 | 299-307 | Hole 28, Core 32, Bag 1 | | 9.01 | | 7.80 | | 0.972 | | | | | | | | | | | | |
| 840 | | Hole 28, Core 32, Bag 2 | | 7.25 | | 8.74 | | 0 964 | * | | | | | | | | | | | |
| 841 | | Hole 28, Core 32, Bag 3 | | 6 23 | | 9 35 | | 0 968 | | | | | | | | | | | | |
| 842 | | Hole 28, Core 32, Bag 4 | | 7.12 | | 10 6 | | 0 967 | | | | | | | | | | | | |
| 843 | 307-314 | Hole 28, Core 33, Bag 1 | | 5.18 | | 11 3 | | 0.964 | * | | | | | | | | | | | |
| 844 | | Hole 28, Core 33, Bag 2 | | 3 49 | | 10.6 | | 0.964 | * | | | | | | | | | | | |

emarks * Specific gravity calculated from average of group.

pervisor W H Reeves

Date Reported February 18, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 5 Golden, Colorado

652- ANALYTICAL LABORATORY REPORT

Lab Group Number 155-65

Project Number 840703

Sponsor Sun Oil Company

Project Engineer W. H Reeves

Date Submitted February 17, 1965

| Lab No | Samp. No | Description | G/T Oil | | G/T Water | | Specific Gravity | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
| 845 | | Hole 28, Core 33, Bag 3 | | 2.68 | | 9 39 | | 0 964 | * | | | | | | | | | | | |

Remarks * Specific gravity calculated from average of group.

Supervisor W A Reeves

Date Reported February 18, 1965

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 1 GOLDEN, COLORADO

Lab Group Number 208-64
Project Number 840703
Sponsor Sun Oil Company

Sec 8-49-7 W 2nd C.H #2 of Sec R
Project Engineer W. H. Reeves
Date Submitted July 24, 1964 Outcrop Samples

# ANALYTICAL LABORATORY REPORT

647-

| Lab No | Samp No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1121 | 79-83 | Bag #1 Core #10 | | 3.22 | | 7.85 | | 0.970 | * | | | | T.D. | | 223 | | | | | | | |
| 1122 | | " 2 " 10 | | 4.05 | | 7.87 | | 0.970 | * | | | | Niobrara | | Top | | 83 ft | | | | | |
| 1123 | | " 3 " 10 | | 6.26 | | 7.28 | | 0.970 | * | | | | | | Base | | 193 | | | | | |
| 1124 | | " 4 " 10 | | 3.44 | | 8.38 | | 0.970 | * | | | | Elevation | | approx | | 1290 | | | | | |
| 1125 | | " 5 " 10 | | 10.3 | | 5.42 | | 0.970 | * | | | | | | | | | | | | | |
| 1126 | | " 6 " 10 | | 9.95 | | 9.24 | | 0.970 | * | | | | | | | | | | | | | |
| 1127 | 83-91 | Bag #1 Core #11 | | 7.05 | | 7.73 | | 0.970 | * | ← | Top | of | Niobrara | | | | | | | | | |
| 1128 | | " 2 " 11 | | 7.26 | | 7.03 | | 0.970 | * | | | | | | | | | | | | | |
| 1129 | | " 3 " 11 | | 7.38 | | 8.78 | | 0.950 | | | | | | | | | | | | | | |
| 1130 | | " 4 " 11 | | 10.8 | | 8.20 | | 0.970 | | | | | | | | | | | | | | |
| 1131 | | " 5 " 11 | | 10.9 | | 6.24 | | 0.970 | * | | | | | | | | | | | | | |
| 1132 | | " 6 " 11 | | 6.46 | | 21.2 | | 0.970 | * | | | | | | | | | | | | | |
| 1133 | 91-95 | Bag#1 Core #12 | | 11.2 | | 8.65 | | 0.970 | * | | | | | | | | | | | | | |
| 1134 | | " 2 " 12 | | 13.8 | | 5.96 | | 0.979 | | | | | | | | | | | | | | |
| 1135 | | " 3 " 12 | | 10.9 | | 8.53 | | 0.979 | | | | | | | | | | | | | | |
| 1136 | | " 4 " 12 | | 8.89 | | 8.22 | | 0.970 | * | | | | | | | | | | | | | |
| 1137 | 95-103 | Bag #1 Core #13 | | 9.33 | | 8.61 | | 0.970 | * | | | | | | | | | | | | | |
| 1138 | | " 2 " 13 | | 6.25 | | 11.4 | | 0.970 | * | | | | | | | | | | | | | |
| 1139 | | " 3 " 13 | | 13.5 | | 8.12 | | 0.968 | | | | | | | | | | | | | | |
| 1140 | | " 4 " 13 | | 13.4 | | 9.11 | | 0.955 | | | | | | | | | | | | | | |
| 1141 | | " 5 " 13 | | 13.9 | | 5.77 | | 0.956 | | | | | | | | | | | | | | |
| 1142 | | " 6 " 13 | | 13.5 | | 7.96 | | 0.963 | | | | | | | | | | | | | | |
| 1143 | 103-113 | Bag #1 Core #14 | | 12.2 | | 4.46 | | 0.938 | | | | | | | | | | | | | | |
| 1144 | | " 2 " 14 | | 10.8 | | 4.62 | | 0.950 | | | | | | | | | | | | | | |
| 1145 | | " 3 " 14 | | 14.1 | | 6.39 | | 0.963 | | | | | | | | | | | | | | |

Remarks * Specific gravity of 0.970 determined from composite of samples in group.

Supervisor

Date Reported July 24, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 2 GOLDEN, COLORADO

Lab Group Number 208-64

Project Number 840703

Project Engineer W. H. Reeves

# ANALYTICAL LABORATORY REPORT

647-

Sponsor Sun Oil Company

Date Submitted July 24, 1964

| Lab No | Samp No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1146 | | Bag #4 Core #14 | | 17.2 | | 8.61 | | 0.963 | | | | | | | | | | | | |
| 1147 | | " 5 " 14 | | 12.0 | | 6.77 | | 0.975 | | | | | | | | | | | | |
| 1148 | | " 6 " 14 | | 10.8 | | 6.55 | | 0.967 | | | | | | | | | | | | |
| 11[illegible] | | " 7 " 14 | | 14.0 | | 6.36 | | 0.943 | | | | | | | | | | | | |
| 1150 | | " 8 " 14 | | 11.2 | | 7.12 | | 0.954 | | | | | | | | | | | | |
| 1151 | | " 9 " 14 | | 10.5 | | 5.68 | | 0.954 | | | | | | | | | | | | |
| 1152 | | " 10 " 14 | | 11.1 | | 5.63 | | 0.933 | | | | | | | | | | | | |
| 1153 | 113-123 | Bag #1 Core #15 | | 9.30 | | 6.07 | | 0.955 | | | | | | | | | | | | |
| 1154 | | " 2 " 15 | | | | | | | | | | | | | | | | | | |
| | | Pan I | | 10.5 | | 8.36 | | 0.988 | | | | | | | | | | | | |
| 1155 | | " 2 " 15 | | | | | | | | | | | | | | | | | | |
| | | Pan II | | 9.23 | | 6.72 | | 0.970 | * | | | | | | | | | | | |
| 1156 | | " 3 " 15 | | | | | | | | | | | | | | | | | | |
| | | Pan I | | 7.74 | | 10.4 | | 0.970 | * | | | | | | | | | | | |
| 11[illegible] | | " 3 " 15 | | | | | | | | | | | | | | | | | | |
| | | Pan II | | 0.0 | | 0.0 | | 0.0 | | | | | | | | | | | | |
| 1158 | | " 4 " 15 | | 9.52 | | 7.23 | | 0.970 | * | | | | | | | | | | | |
| 1159 | | " 5 " 15 | | 11.0 | | 8.60 | | 0.930 | | | | | | | | | | | | |
| 1160 | | " 6 " 15 | | 8.41 | | 11.4 | | 0.970 | * | | | | | | | | | | | |
| 1161 | 123-133 | Bag #1 Core #16 | | 9.62 | | 8.37 | | 0.958 | | | | | | | | | | | | |
| 1162 | | " 2 " 16 | | 9.87 | | 7.76 | | 0.959 | | | | | | | | | | | | |
| 1163 | | " 3 " 16 | | 9.16 | | 7.05 | | 0.951 | | | | | | | | | | | | |
| 1164 | | " 4 " 16 | | 9.38 | | 7.38 | | 0.970 | * | | | | | | | | | | | |
| 1165 | | " 5 " 16 | | 9.32 | | 8.21 | | 0.970 | * | | | | | | | | | | | |
| 1166 | | " 6 " 16 | | 6.34 | | 9.60 | | 0.970 | * | | | | | | | | | | | |

Remarks *Specific gravity of 0.970 determined from composite of samples in group.

Supervisor [signature]

Date Reported July 24, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

PAGE NO. 1 GOLDEN, COLORADO

Lab Group Number 212-64

Project Number 840703

Project Engineer W. H. Reeves

# ANALYTICAL LABORATORY REPORT

647-

Sponsor Sun Oil Company

Date Submitted July 27, 1964

| Lab No | Samp No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1222 | | Bag #7 Core #16 | | 11.7 | | 11.5 | | 0.981 | | | | | | | | | | | | |
| 1223 | | " 8 " 16 | | 7.24 | | 13.0 | | 0.987 | | | | | | | | | | | | |
| 1224 | 133-143 | Bag #1 Core #17 | | 7.54 | | 9.57 | | 0.953 | | | | | | | | | | | | |
| 1225 | | " 2 " 17 | | 2.23 | | 14.0 | | 0.970 | * | | | | | | | | | | | |
| 1226 | | " 3 " 17 | | 9.26 | | 10.0 | | 0.968 | | | | | | | | | | | | |
| 1227 | | " 4 " 17 | | 10.1 | | 11.4 | | 0.975 | | | | | | | | | | | | |
| 1228 | | " 5 " 17 | | 11.8 | | 11.0 | | 0.966 | | | | | | | | | | | | |
| 1229 | | " 6 " 17 | | 12.2 | | 11.6 | | 0.953 | | | | | | | | | | | | |
| 1230 | | " 7 " 17 | | 10.0 | | 12.1 | | 0.966 | | | | | | | | | | | | |
| 1231 | 143-153 | Bag #1 Core #18 | | 9.60 | | 9.31 | | 0.970 | * | | | | | | | | | | | |
| 1232 | | " 2 " 18 | | 8.61 | | 10.1 | | 0.969 | | | | | | | | | | | | |
| 1233 | | " 3 " 18 | | 12.2 | | 7.59 | | 0.959 | | | | | | | | | | | | |
| 1234 | | " 4 " 18 | | 10.2 | | 7.58 | | 0.965 | | | | | | | | | | | | |
| 1235 | | " 5 " 18 | | 9.50 | | 8.47 | | 0.970 | * | | | | | | | | | | | |
| 1236 | | " 6 " 18 | | 14.1 | | 7.64 | | 0.981 | | | | | | | | | | | | |
| 1237 | | " 7 " 18 | | 13.8 | | 6.77 | | 0.981 | | | | | | | | | | | | |
| 1238 | | " 8 " 18 | | 11.3 | | 8.45 | | 0.965 | | | | | | | | | | | | |
| 1239 | | " 9 " 18 | | 13.4 | | 9.00 | | 0.982 | | | | | | | | | | | | |
| 1240 | 153-163 | Bag #1 Core #19 | | 10.9 | | 9.42 | | 0.970 | | | | | | | | | | | | |
| 1241 | | " 2 " 19 | | 9.53 | | 12.1 | | 0.978 | | | | | | | | | | | | |
| 1242 | | " 3 " 19 | | 10.5 | | 11.0 | | 0.976 | | | | 156 | | | | | | | | |
| 1243 | | " 4 " 19 | | 14.9 | | 11.1 | | 0.992 | | | | | | | | | | | | |
| 1244 | | " 5 " 19 | | 21.0 | x | 10.8 | | 0.974 | | | | | | | | | | | | |
| 1245 | | " 6 " 19 | | 22.7 | x | 8.92 | | 0.975 | | | | | | | | | | | | |
| 1246 | | " 7 " 19 | | 20.7 | x | 9.80 | | 0.966 | | | | | | | | | | | | |

Remarks * Specific gravity of 0.970 determined from composite of samples in group.

Supervisor

Date Reported July 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 2 GOLDEN, COLORADO

Lab Group Number 212-64
Project Number 840703
Project Engineer W. H. Reeves
Sponsor Sun Oil Company
Date Submitted July 27, 1964

# ANALYTICAL LABORATORY REPORT

647-

| Lab. No | Samp No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1247 | | Bag #8 Core #19 | | 9.95 | | 9.54 | | 0.959 | | | | | | | | | | | | |
| 1248 | | " 9 " 19 | | 22.7 | | 12.2 | | 0.969 | | | | | | | | | | | | |
| 1249 | 163-173 | Bag #1 Core #20 | | 14.5 | | 14.2 | | 0.979 | | | | | | | | | | | | |
| 1[illegible] | | " 2 " 20 | | 16.3 | | 9.44 | | 0.970 | * | | | | | | | | | | | |
| 1251 | | " 3 " 20 | x | 21.2 | | 13.2 | | 0.975 | | | | | | | | | | | | |
| 1252 | | " 4 " 20 | x | 24.1 | | 11.1 | | 0.970 | * | | | | | | | | | | | |
| 1253 | | " 5 " 20 | | 18.6 | | 11.5 | | 0.972 | | | | | | | | | | | | |
| 1254 | | " 6 " 20 | | 18.9 | | 13.4 | | 0.968 | | | | | | | | | | | | |
| 1255 | | " 7 " 20 | | 17.7 | | 13.9 | | 0.993 | | | | | | | | | | | | |
| 1256 | | " 8 " 20 | x | 22.1 | | 12.9 | | 0.960 | | | | 170 | | | | / | | | | |
| 1257 | | " 9 " 20 | | 6.01 | | 12.8 | | 0.970 | * | | | | | | | | | | | |
| 1258 | | " 10 " 20 | | 5.68 | | 5.72 | | 0.945 | | | | | | | | | | | | |
| 1259 | | " 11 " 20 | | 9.14 | | 6.29 | | 0.970 | * | | | | | | | | | | | |
| 1260 | 173-183 | Bag #1 Core #21 | | 12.6 | | 5.77 | | 0.946 | | | | | | | | | | | | |
| 1[illegible]1 | | " 2 " 21 | | 6.53 | | 13.9 | | 0.970 | * | | | | | | | | | | | |
| 1262 | | " 3 " 21 | | 10.0 | | 6.31 | | 0.964 | | | | | | | | | | | | |
| 1263 | | " 4 " 21 | | 12.1 | | 7.86 | | 0.972 | | | | | | | | | | | | |
| 1264 | | " 5 " 21 | | | | | | | | | | | | | | | | | | |
| | | Pan I | | Trace | | 7.61 | | 0.956 | * | | | | | | | | | | | |
| 1265 | | " 5 " 21 | | | | | | | | | | | | | | | | | | |
| | | Pan II | | 11.4 | | 6.51 | | 0.953 | | | | | | | | | | | | |
| 1266 | | " 6 " 21 | | 15.0 | | 6.55 | | 0.949 | | | | | | | | | | | | |
| 1267 | | " 7 " 21 | | 8.08 | | 9.95 | | 0.935 | | | | | | | | | | | | |
| 1268 | | " 8 " 21 | | 9.02 | | 8.29 | | 0.955 | | | | | | | | | | | | |

Remarks * Specific gravity of 0.970 and 0.956 determined from composite of samples in group.

Supervisor W. H. Reeves

Date Reported July 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO.
GOLDEN, COLORADO

Lab Group Number 212-64
Project Number 840703
Project Engineer W. H. Reeves

647- ANALYTICAL LABORATORY REPORT

Sponsor Sun Oil Company
Date Submitted July 27, 1964

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|
| 1269 | | Bag #9 Core #21 | | | | | | | | |
| | | Pan I | | 11.7 | | 5.56 | | 0.948 | | |
| 1270 | | " 9 " 21 | | | | | | | | |
| | | Pan II | | 12.2 | | 7.92 | | 0.939 | | |
| 1271 | 183-193 | Bag #1 Core #22 | | 8.37 | | 12.0 | | 0.955 | | |
| 1272 | | " 2 " 22 | | 7.40 | | 13.0 | | 0.967 | | |
| 1273 | | " 3 " 22 | | 7.06 | | 9.72 | | 0.961 | | |
| 1274 | | " 4 " 22 | | 7.63 | | 10.1 | | 0.973 | | |
| 1275 | | " 5 " 22 | | 6.70 | | 9.43 | | 0.956 | * | |
| 1276 | | " 6 " 22 | | 7.93 | | 8.62 | | 0.956 | * | |
| 1277 | | " 7 " 22 | | 5.45 | | 9.47 | | 0.956 | * | |
| 1278 | | " 8 " 22 | | 3.68 | | 10.2 | | 0.956 | * | |
| 1279 | 193 203 | Bag #1 Core #23 | | 2.74 | | 9.44 | | 0.956 | * | |
| 1280 | | " 2 " 23 | | 3.37 | | 9.31 | | 0.956 | * | |

← Base of Niobrara

Remarks * Specific gravity of 0.956 determined from composite of samples in group.

Supervisor W. H. Reeves

Date Reported July 29, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. 647-
GOLDEN, COLORADO

Lab Group Number 219-64
Project Number 840703
Sponsor Sun Oil Company

Project Engineer W. H. Reeves
Date Submitted July 29, 1964

# ANALYTICAL LABORATORY REPORT

| Lab. No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1354 | 193 203 | Bag #3 Core #23 | | 2.81 | | 8.56 | | 0.970 | * | | | | | | | | | | | |
| 1355 | | " 4 " 23 | | 2.30 | | 7.66 | | " | * | | | | | | | | | | | |
| 1356 | | " 5 " 23 | | 2.32 | | 8.39 | | " | * | | | | | | | | | | | |
| 1357 | | " 6 " 23 | | 3.14 | | 7.62 | | " | * | | | | | | | | | | | |
| 1358 | | " 7 " 23 | | 2.44 | | 8.48 | | " | * | | | | | | | | | | | |
| 1359 | | " 8 " 23 | | 3.76 | | 8.48 | | " | * | | | | | | | | | | | |
| 1360 | | " 9 " 23 | | 2.11 | | 9.89 | | " | * | | | | | | | | | | | |
| 1361 | 203-213 | Bag #1 Core #24 | | 0.32 | | 9.77 | | " | * | | | | | | | | | | | |
| 1362 | | " 2 " 24 | | 0.69 | | 9.81 | | " | * | | | | | | | | | | | |
| 1363 | | " 3 " 24 | | | | | | | | | | | | | | | | | | |
| | | Pan I | | 0.28 | | 9.03 | | " | * | | | | | | | | | | | |
| 1364 | | " 3 " 24 | | | | | | | | | | | | | | | | | | |
| | | Pan II | | 1.01 | | 4.55 | | " | * | | | | | | | | | | | |
| 1365 | | " 4 " 24 | | | | | | | | | | | | | | | | | | |
| | | Pan I | | 0.59 | | 8.47 | | " | * | | | | | | | | | | | |
| 1366 | | " 4 " 24 | | | | | | | | | | | | | | | | | | |
| | | Pan II | | 0.29 | | 9.66 | | " | * | | | | | | | | | | | |
| 1367 | | " 5 " 24 | | 0.29 | | 10.4 | | " | * | | | | | | | | | | | |
| 1368 | | " 6 " 24 | | 0.0 | | 8.80 | | " | * | | | | | | | | | | | |
| 1369 | | " 7 " 24 | | 0.0 | | 9.07 | | " | * | | | | | | | | | | | |
| 1370 | | " 8 " 24 | | | | | | | | | | | | | | | | | | |
| | | Pan I | | 0.0 | | 7.48 | | " | * | | | | | | | | | | | |
| 1371 | | " 8 " 24 | | | | | | | | | | | | | | | | | | |
| | | Pan II | | 0.0 | | 8.64 | | " | * | | | | | | | | | | | |
| 1372 | | " 9 " 24 | | 0.0 | | 3.68 | | " | * | | | | | | | | | | | |

Remarks * Specific gravity of 0.970 determined from composite of samples in group.

Supervisor W. H. Reeves

Date Reported July 30, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. [redacted] GOLDEN, COLORADO

Lab Group Number 219-64
Project Number 840703
Project Engineer W. H. Reeves [redacted]

# ANALYTICAL LABORATORY REPORT

647-

Sponsor Sun Oil Company
Date Submitted July 29, 1964

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1373 | | Bag #10 Core #24 | | 0.0 | | 8.80 | | 0.970 | * | | | | | | | | | | | |
| 1374 | 213-227 | Bag #1 Core #25 | | 1.81 | | 9.42 | | " | * | | | | | | | | | | | |
| 1375 | | " 2 " 25 | | 1.73 | | 8.98 | | " | * | | | | | | | | | | | |
| 1376 | | " 3 " 25 | | 0.93 | | 8.42 | | " | * | | | | | | | | | | | |
| 1377 | | " 4 " 25 | | | | | | | | | | | | | | | | | | |
| | | Pan I | | 0.95 | | 6.76 | | " | * | | | | | | | | | | | |
| 1378 | | " 4 " 25 | | | | | | | | | | | | | | | | | | |
| | | Pan II | | 0.97 | | 7.39 | | " | * | | | | | | | | | | | |
| 1379 | | " 5 " 25 | | 0.53 | | 8.43 | | " | * | | | | | | | | | | | |
| 1380 | | " 6 " 25 | | 0.29 | | 8.58 | | " | * | | | | | | | | | | | |
| 1381 | | L - 1 - A | | 4.86 | | 7.32 | | " | * | | | | | | | | | | | |
| 1382 | | L - 1 - B | | 6.61 | | 9.06 | | " | * | | | | | | | | | | | |
| 1383 | | L - 1 - C | | 9.50 | | 10.5 | | " | * | | | | | | | | | | | |
| 1384 | | L - 1 - X | | 5.86 | | 8.17 | | " | * | | | | | | | | | | | |
| 1385 | | L - 1 - Y | | 7.95 | | 7.00 | | " | * | | | | | | | | | | | |
| 1386 | | L - 2 - A | | 7.01 | | 5.52 | | " | * | | | | | | | | | | | |
| 1387 | | L - 2 - B | | 4.35 | | 7.96 | | " | * | | | | | | | | | | | |
| 1388 | | L - 2 - C | | 5.98 | | 12.0 | | " | * | | | | | | | | | | | |
| 1389 | | L - 2 - X | | 1.28 | | 10.3 | | " | * | | | | | | | | | | | |
| 1390 | | L - 3- A | | 7.56 | | 6.65 | | " | * | | | | | | | | | | | |
| 1391 | | L - 3 - B | | 2.68 | | 5.57 | | " | * | | | | | | | | | | | |
| 1392 | | L - 3 - C | | 1.37 | | 8.37 | | " | * | | | | | | | | | | | |
| 1393 | | L - 4 - A | | 0.77 | | 14.3 | | " | * | | | | | | | | | | | |
| 1394 | | L - 4 - C | | 1.86 | | 10.7 | | " | * | | | | | | | | | | | |
| 1395 | | L - 5 - A | | 1.79 | | 3.44 | | " | * | | | | | | | | | | | |

Scattered outcrop samples

Remarks * Specific gravity of 0.970 determined from composite of samples in group.

Supervisor W. H. Reeves

Date Reported July 30, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO.
GOLDEN, COLORADO

Lab Group Number 219-64
Project Number 840703
Project Engineer W. H. Reeves
Sponsor Sun Oil Company
Date Submitted July 29, 1964

# ANALYTICAL LABORATORY REPORT

647-

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1421 | | T - 14 | | 1.52 | | 14.9 | | 0.970 | * | | | | | | | | | | | |
| 1422 | | T - 15 - B | | 1.08 | | 18.1 | | " | * | | | | | | | | | | | |
| 1423 | | T - 15 - C | | 1.53 | | 13.8 | | " | * | | | | | | | | | | | |
| 1424 | | T - 16 - A | | 2.32 | | 15.5 | | " | * | | | | | | | | | | | |
| 1425 | | T - 16 - B | | 3.34 | | 16.9 | | " | * | | | | | | | | | | | |
| 1426 | | T - 16 - C | | 2.10 | | 11.2 | | " | * | | | | | | | | | | | |

Remarks * Specific gravity of 0.970 determined from composite of samples in group.

Supervisor W. H. Reeves

Date Reported July 30, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION
PAGE NO. [redacted] GOLDEN, COLORADO

Lab Group Number 219-64
Project Number 840703
Project Engineer W. H. Reeves
Sponsor Sun Oil Company
Date Submitted July 29, 1964

# ANALYTICAL LABORATORY REPORT

647-

| Lab No | Samp. No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | Specific Gravity Est | Specific Gravity Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1396 | | L - 5 - B | | 3.54 | | 3.10 | | 0.970 | * | | | | | | | | | | | |
| 1397 | | L - 5 - C | | 1.99 | | 1.92 | | " | * | | | | | | | | | | | |
| 1398 | | L - 6 - A | | 4.95 | | 7.89 | | " | * | | | | | | | | | | | |
| 99 | | L - 6 - B | | 2.10 | | 9.27 | | " | * | | | | | | | | | | | |
| 1400 | | L - 6 - C | | 5.64 | | 4.36 | | " | * | | | | | | | | | | | |
| 1401 | | T - 1 | | 4.18 | | 19.5 | | " | * | | | | | | | | | | | |
| 1402 | | T - 2 | | 1.18 | | 19.9 | | " | * | | | | | | | | | | | |
| 1403 | | T - 3 | | 3.25 | | 31.3 | | " | * | | | | | | | | | | | |
| 1404 | | L - 4 - B | | 0.88 | | 18.0 | | " | * | | | | | | | | | | | |
| 1405 | | T - 5 - A | | 0.87 | | 5.07 | | " | * | | | | | | | | | | | |
| 1406 | | T - 5 - B | | 0.83 | | 5.34 | | " | * | | | | | | | | | | | |
| 1407 | | T - 5 - C | | 1.29 | | 17.3 | | " | * | | | | | | | | | | | |
| 1408 | | T - 6 - A | | 1.03 | | 10.0 | | " | * | | | | | | | | | | | |
| 1409 | | T - 6 - B | | 0.99 | | 17.8 | | " | * | | | | | | | | | | | |
| 10 | | T - 6 - C | | 3.55 | | 12.6 | | " | * | | | | | | | | | | | |
| 1411 | | T - 9 - A | | 0.70 | | 2.66 | | " | * | | | | | | | | | | | |
| 1412 | | T - 9 - B | | 0.0 | | 6.81 | | " | * | | | | | | | | | | | |
| 1413 | | T - 9 - C | | 2.03 | | 12.4 | | " | * | | | | | | | | | | | |
| 1414 | | T - 10 - A | | 6.09 | | 5.17 | | " | * | | | | | | | | | | | |
| 1415 | | T - 10 - B | | 4.26 | | 4.77 | | " | * | | | | | | | | | | | |
| 1416 | | T - 11 | | 4.01 | | 17.0 | | " | * | | | | | | | | | | | |
| 1417 | | T - 12 - A | | 0.69 | | 13.2 | | " | * | | | | | | | | | | | |
| 1418 | | T - 12 - B | | 0.37 | | 12.3 | | " | * | | | | | | | | | | | |
| 1419 | | T - 12 - C | | 1.73 | | 14.0 | | " | * | | | | | | | | | | | |
| 1420 | | T - 13 | | 0.99 | | 11.2 | | " | * | | | | | | | | | | | |

Remarks * Specific gravity of 0.970 determined from composite of samples in group.

Supervisor W. H. Reeves

Date Reported July 30, 1964

COLORADO SCHOOL OF MINES RESEARCH FOUNDATION

GOLDEN, COLORADO

Lab Group Number 295-64

Project Number 840703 Project Engineer W. H. Reeves

# ANALYTICAL LABORATORY REPORT

Sponsor Sun Oil Company Date Submitted August 7, 1964

648-

| Lab No | Samp No | Description | G/T Oil Est | G/T Oil Fnd | G/T Water Est | G/T Water Fnd | BTU/lb Est | BTU/lb Fnd | $(NH_4)_2SO_4$ Est | $(NH_4)_2SO_4$ Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd | Est | Fnd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1209 | | Raw Shale | | 17.9 | | 16.1 | | 3330 | | 0.07 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | N | | S | | Sp.Gr. | | Viscosity | | | | | | | | | | |
| 1209 | | Oil | | 1.22 | | 6.95 | | 0.965 | | 100° F - | | 73.5 | SSU | | | | | | | |
| | | | | | | | | | | 122° F - | | 56.2 | SSU | | | | | | | |
| | | | | | | | | | | 130° F - | | 52.8 | SSU | | | | | | | |

Remarks

Supervisor

Date Reported August 24, 1964

SUN OIL COMPANY

# OIL SHALE LANDS

MANITOBA AND SASKATCHEWAN

T - TEDRICK ---------- PARTY # 11 FIELD SEASONS

L - LINCKENS ---------- PARTY # 12 FIELD SEASONS

OUTCROP OF OIL SHALE ( Niobrara Fm.)

LINE OF CROSS SECTION CORE HOLE 27 TO CORE HOLE 18

SCALE: 1" = 32,000'  DATE: FEBRUARY, 1965

GEOLOGY BY: W. H. TISDALL  DRAFTING BY: G. R. P.

MAP No. 2

Oil Shale # 1-8-10

Porcupine Forest, Duck Mtn. Area

MB 1965

242

## CROSS SECTION OF TOPOGRAPHY & NIOBRARA FM.

Core Hole 27 Sec. 15-48-11 W2

Core Hole 2 Sec. 8-49-7 W2

Core Hole 1 Sec. 20-50-5 W2

Core Hole 22 Sec. 20-45-4 W2

Core Hole 20 Sec. 20-40-26 W1

Core Hole 16C Sec. 24-35-25 W1

Core Hole 17 Sec. 13-31-23 W1

Core Hole 18 Sec. 4-24-21 W1

SASK. MAN.

Porcupine Mountain

Pasquia Hills

Duck Mountain

POTENTIAL MINING AREA

2500 2400 2200 2000 1800 1600 1400 1200

Grd. Niobrara Base T.D.

32' @ 8.4 Gal/Ton

111.5' @ 10.8 Gal/Ton

152' @ 8.56 Gal/Ton

140' @ 6.7 Gal/Ton

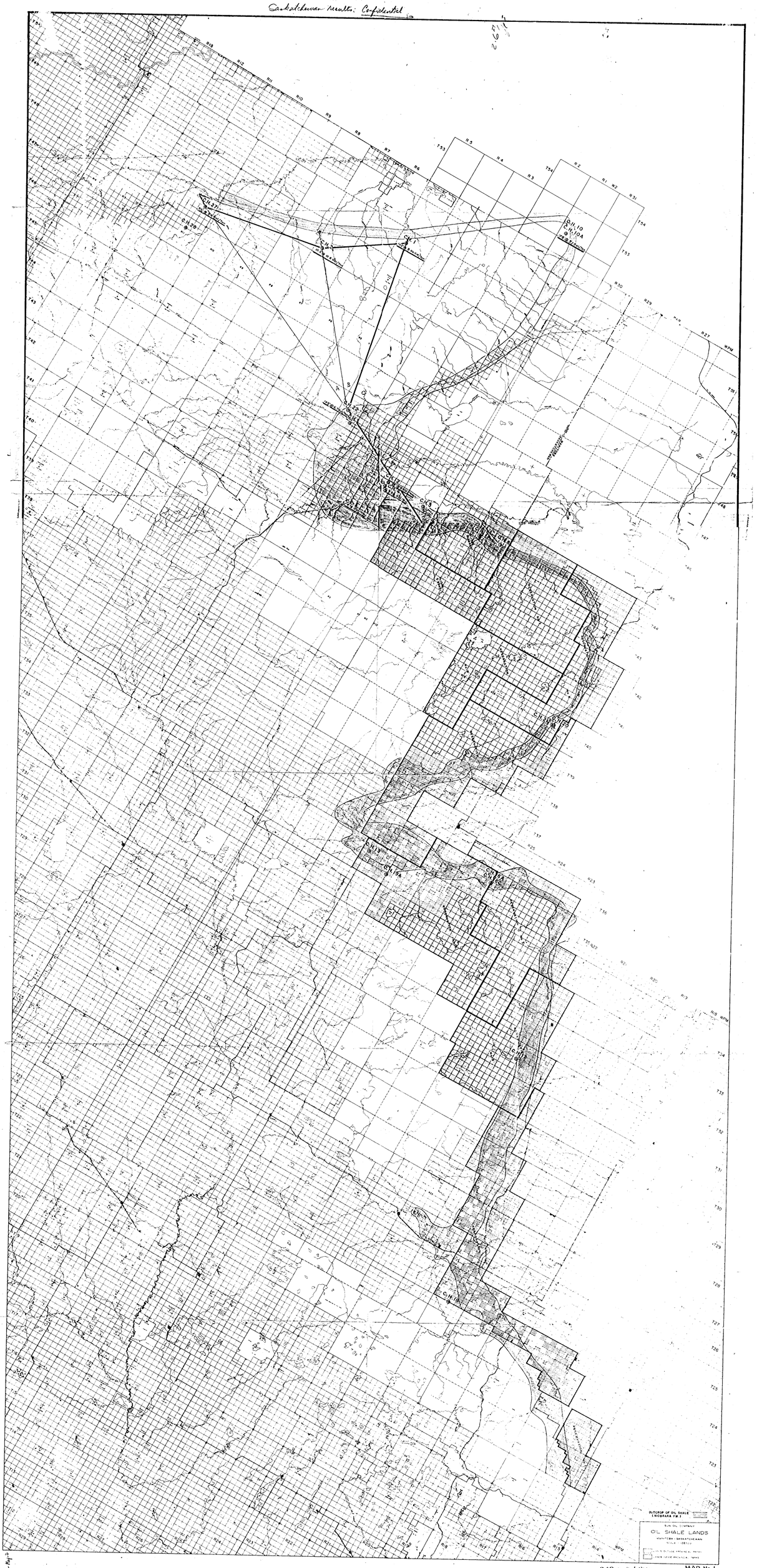
T.D. Lost Circulation

67' @ 7.12 Gal/Ton

128' @ 6.72 Gal/Ton

1000' Above Sea Level

Saskatchewan results: Confidential




MAP No. 1.

Oil Shale # 1-1410

Porcupine Point + Duck Mtn Area

MB 1965