

Core Logs from Searles Lake, San Bernardino County, California

By DAVID V. HAINES

GEOLOGIC INVESTIGATIONS IN THE MOJAVE DESERT
AND ADJACENT REGION, CALIFORNIA

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*Detailed logs of drill cores
of Quaternary evaporites and
sediments*



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1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in financial matters. The text outlines various methods for organizing and storing data, including digital databases and physical filing systems.

2. The second section focuses on the role of technology in modern record management. It highlights how software solutions can streamline processes, reduce errors, and provide real-time access to information. Examples of specific tools and platforms are mentioned, along with their benefits for different types of organizations.

3. The third part of the document addresses the challenges associated with data security and privacy. It discusses the risks of unauthorized access, data breaches, and the importance of implementing robust security protocols. The text also touches upon regulatory requirements, such as GDPR, and provides guidance on how to ensure compliance.

4. The final section offers practical advice and best practices for implementing an effective record management system. It encourages a proactive approach, where records are regularly reviewed and updated. The document concludes by stressing the long-term value of a well-maintained record system for decision-making and organizational success.

GEOLOGIC INVESTIGATIONS IN THE MOJAVE DESERT AND ADJACENT REGION, CALIFORNIA

CORE LOGS FROM SEARLES LAKE SAN BERNARDINO COUNTY, CALIFORNIA

By DAVID V. HAINES

ABSTRACT

Forty-one drill holes in the saline deposit on Searles Lake, San Bernardino County, Calif., were cored and logged. Drill holes averaged about 100 feet in depth; the majority are located around the margins of the dry lake. The saline deposit consists of an upper salt body about 39 square miles in area, of which 12 square miles are exposed in the central part of the lake, and a lower salt body of approximately the same areal extent found at greater depth. The 2 salt bodies are separated by a seam of clay or marl averaging about 12 feet thick. Isopach maps show the salt bodies are slightly elongated to the north; maximum thicknesses of the upper and lower salt bodies are 95 and 54 feet, respectively. Core logs, in written and graphic form, show the chief minerals of the saline bodies are halite, trona, hanksite, borax, and burkeite; relatively minor quantities of 13 additional minerals are described. The 41 drill-hole logs are shown graphically in columnar sections which give thicknesses, mineralogy, and mineral percentages; 15 representative written logs are published in full.

INTRODUCTION •

This report presents in preliminary form some of the results of drilling done on private contract on Searles Lake, San Bernardino County, Calif., for the Geological Survey from July 1954 to November 1955. The drilling was undertaken to obtain basic information on the shape, thickness, and character of the saline deposit, particularly near the margins. This report is limited to the detailed core logs and drilling methods and to a summary of the salient geologic features of the deposit; variations in the thickness of the saline deposit are shown by means of isopach maps. Further study and a more comprehensive report are in progress.

A total of 41 holes were drilled on Searles Lake, representing 3,412 feet of coring and reaming and averaging 77.6 percent core recovery. The average depth of the majority of holes drilled was about 100 feet, though several shallow holes were drilled to depths of about 30 feet.

ACKNOWLEDGMENTS

The drilling program was carried out with the cooperation of the American Potash & Chemical Corp., the West End Chemical Co., the Searles Lake Chemical Corp., and the San Bernardino Borax Mining Co., Ltd., all of whom permitted drilling of their properties on Searles Lake.

Microscopic and X-ray determinations of many mineral specimens were made by Robert D. Allen, of the Geological Survey.

About 1,200 samples were taken by the writer for chemical analysis. These chemical determinations, chiefly for boron, were made by Henry Kramer, Sol Berman, and Hy Almond, chemists, of the U. S. Geological Survey. Results of these chemical analyses are in preparation.

LOCATION

Searles Lake is in the northwest corner of San Bernardino County, Calif., in Tps. 25 and 26 S., Rs. 43 and 44 E., Mount Diablo base line and meridian (fig. 6). It is about 130 miles airline northeast of Los Angeles and 50 miles airline southwest of Death Valley, and may be reached by paved highways. The area is shown on the 15-minute Trona and Searles Lake topographic quadrangle maps published by the U. S. Geological Survey. The towns of Trona and Westend are on the west side of the lake and are supported chiefly by the plants processing brine from Searles Lake. The Searles Lake deposit has been described in various reports (Gale, 1914; Dyer, 1950; Ryan, 1951; Smith and Pratt, 1957).

The location of the 41 holes drilled under contract for the U. S. Geological Survey are shown on plates 5 and 6.

• SURFACE FEATURES

Searles Lake is located physiographically near the boundary of the Great Basin section and the Sonoran Desert section of the Basin and Range province as defined by Fenneman (1931). This area consists chiefly of isolated short ranges separated by desert plains. It is in the northwestern part of the Mojave Desert region as defined by Thompson (1929) and Hewett (1954). The dry lake forms the floor of an intermontane basin which lies between the Argus Range on the west and the Slate Range on the east. The highest elevation on the west side of the basin is represented by Argus Peak at an altitude of 6,562 feet; the highest altitude in the Slate Range is 5,578 feet. The playa surface of Searles Lake is at an altitude of 1,616 feet in the center and rises gradually to approximately 1,624 feet near the edges.

The present surface of Searles Lake is a playa which is slightly elongated toward the north. In its dimensions, the playa is about 9 miles in greatest length and 7 miles in greatest width, and covers an

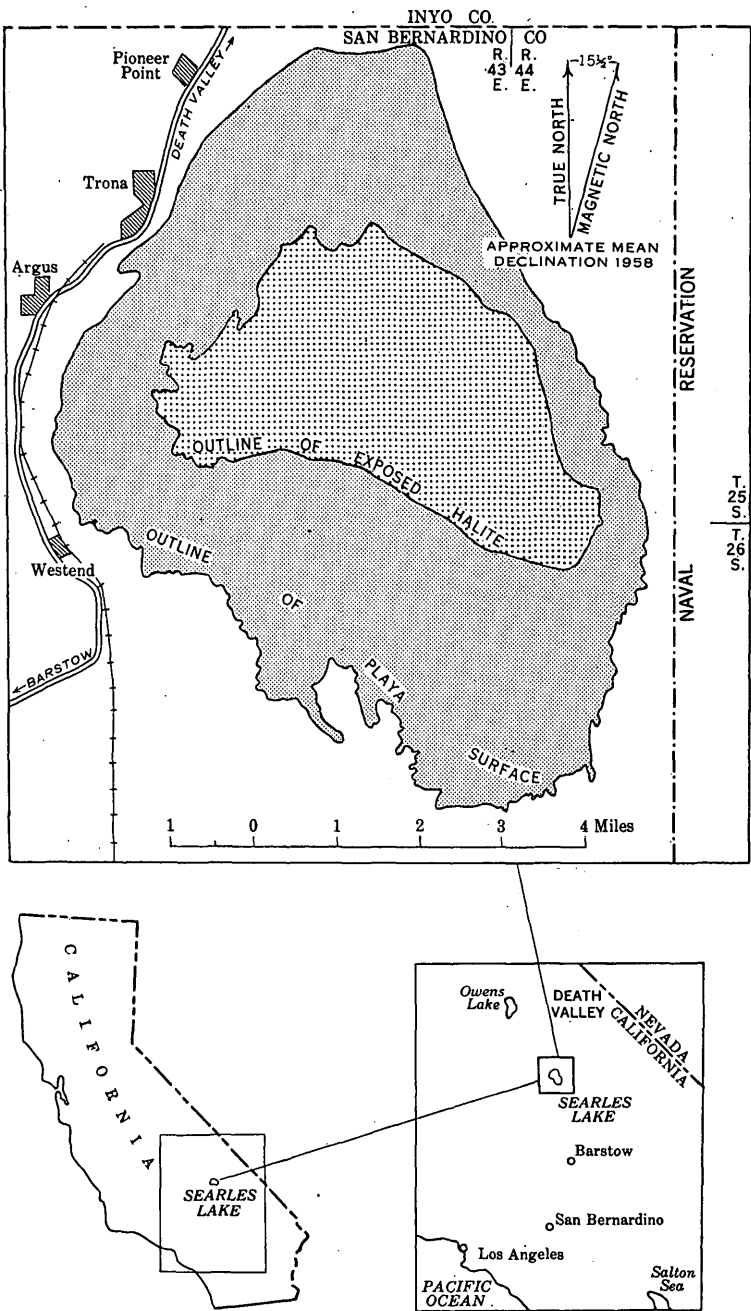


FIGURE 6.—Index map of Searles Lake, San Bernardino County, Calif.

area of about 41 square miles. Of this area, 12 square miles consists of exposed halite in the center of the lake, and 29 square miles consists of soft smooth moist clay around the margins. At the margins of the lake, the clay grades into silt, sand, and eventually into the coarser alluvium on the surrounding slopes. Locally, the clay areas are covered by a level hard porous crust consisting of a cellular massive intergrown mixture of halite, trona, gaylussite, clay, and possibly other minerals. A prominent zone of rough hard cavernous crust known as the Trona Reef is present at the margin of the playa surface on the east and northeast side of the lake.

Travel by vehicle over the central area of exposed halite is possible throughout most of the year. A leached zone of salts characterized by easily collapsible cavernous holes is present, however, in section 28 and the northern part of section 33, and travel over this salt surface is not possible with ordinary vehicles or tractors. The clay areas surrounding the exposed halite are generally accessible only by means of sleds pulled by tractors. In some places, the clay areas are inaccessible even by these means. Many drill holes were possible only near roads which have been built over the clay areas. Therefore some drill holes were located in part by the accessibility of the area.

Rainfall at Trona averages about 4 inches per year and is mostly confined to the winter months. At that time of year, the playa surface may be covered with a thin sheet of water several inches to a few feet deep. Drainage into the playa is derived largely from the slopes of the Argus and Slate Ranges.

Near the contact of the exposed halite and marginal clay, pools of stagnant brine are commonly present. These brine pools are usually discolored red or reddish brown.

OWNERSHIP AND PRODUCTION

The greater part of the saline deposit at Searles Lake is presently held by four companies; namely, the American Potash & Chemical Corp., the West End Chemical Co., the San Bernardino Borax Mining Co., and the Searles Lake Chemical Corp. The history of ownership at Searles Lake and the problems encountered in early development and production are described by Dyer (1950) and Teeple (1929).

MINERALOGY

The following minerals, in approximate order of abundance, were identified at Searles Lake from cores obtained from the U. S. Geological Survey drill holes shown on plates 5 and 6:

| | |
|-----------------|--|
| Halite..... | NaCl |
| Trona..... | $\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$ |
| Hanksite..... | $9\text{Na}_2\text{SO}_4 \cdot 2\text{Na}_2\text{CO}_3 \cdot \text{KCl}$ |
| Gaylussite..... | $\text{CaCO}_3 \cdot \text{Na}_2\text{CO}_3 \cdot 5\text{H}_2\text{O}$ |

| | |
|-------------------------------|---|
| Pirssonite..... | $\text{CaCO}_3 \cdot \text{Na}_2\text{CO}_3 \cdot 2\text{H}_2\text{O}$ |
| Borax..... | $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ |
| Dolomite..... | $\text{CaMg}(\text{CO}_3)_2$ |
| Burkeite..... | $\text{Na}_2\text{CO}_3 \cdot 2\text{Na}_2\text{SO}_4$ |
| Northupite..... | $\text{MgCO}_3 \cdot \text{Na}_2\text{CO}_3 \cdot \text{NaCl}$ |
| Aragonite..... | CaCO_3 |
| Nahcolite..... | NaHCO_3 |
| Thenardite..... | Na_2SO_4 |
| Sulfohalite..... | $2\text{Na}_2\text{SO}_4 \cdot \text{NaCl} \cdot \text{NaF}$ |
| Aphthitalite (glaserite)..... | $\text{K}_3\text{Na}(\text{SO}_4)_2$ |
| Tychite..... | $2\text{MgCO}_3 \cdot 2\text{Na}_2\text{CO}_3 \cdot \text{Na}_2\text{SO}_4$ |
| Schairerite..... | $\text{Na}_2\text{SO}_4 \cdot \text{Na}(\text{F}, \text{Cl})$ |
| Tincalconite..... | $\text{Na}_2\text{B}_4\text{O}_7 \cdot 5\text{H}_2\text{O}$ |
| Calcite..... | CaCO_3 |

Most of these minerals were precipitated as a result of evaporation of the lake water during interpluvial substages of late Quaternary time. Pluvial substages of late Quaternary time are generally believed to be represented by seams of clay and marl. (The term "clay" as used in the core logs and throughout this report refers only to particle size and not to mineral composition.)

The minerals usually found in the evaporite bodies are halite, trona, hanksite, borax, burkeite, thenardite and aphthitalite (glaserite); minerals usually associated with clay and marl seams are gaylussite, pirssonite, dolomite, aragonite, nahcolite, tychite, and schairerite; minerals which occur about equally in both environments are northupite and sulfohalite.

The evaporite bodies consist of a mesh of minerals with the interstices filled with brine that is saturated in the various compounds that make up these minerals.

Discolorations and inclusions of predominantly reddish-orange to reddish-brown material commonly occur in the evaporite bodies and in clay-marl seams. These discolorations occur in the form of irregular stringers, seams, and nodules or as discrete inclusions in many of the evaporite minerals. The material is believed to be a pigment (Vallentyne, 1956), possibly derived from bacteria or algae. Brine in stagnant pools at the surface is similarly discolored.

In addition to the minerals listed above, searlesite ($\text{Na}_2\text{O} \cdot \text{B}_2\text{O}_3 \cdot 4\text{SiO}_2 \cdot 2\text{H}_2\text{O}$) and mirabilite ($\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$) have been found in deeper parts of the basin fill (Gale, 1914; Smith and Pratt, 1957), and galeite ($\text{Na}_2\text{SO}_4 \cdot \text{Na}(\text{F}, \text{Cl})$) has been described by Pabst and others (1955). Gale (1914, p. 297) also reports the occurrence of natron, gypsum, anhydrite, and glauberite, but these minerals have not been recognized in the cores obtained in the present drilling. Mirabilite is artificially produced from brine during the winter months. Tincalconite, apparently precipitated from the brine, was described by Pabst and

Sawyer (1948), though it commonly occurs as a secondary dehydration product of borax.

GEOLOGY

SALT BODIES

The saline deposit consists principally of two major beds of saline minerals separated by a seam of clay and marl. Figure 7 illustrates graphically a core log generalized from holes GS-14, GS-15, and GS-16. These cores adequately represent the character of most of the saline deposit. Both major salt beds conform closely in area and shape with the present playa surface.

The uppermost salt body, known locally as the "upper salt," "upper structure," or "upper crystal body," is exposed over an area of about 12 square miles in the central part of the lake (fig. 6). Around this central area of exposed halite is a deposit of clay which overlies an additional 27 square miles of salt. This clay is locally referred to as the "overburden mud" and reaches a thickness of 30 to 40 feet near the margins of the playa. It grades from a brown color at the surface through green to black at the base and contains disseminated pirsomite crystals in the lower few feet; laminae are not present.

The upper salt body consists chiefly of halite, hanksite, trona, and borax and a prominent zone of clay near the top of the section. The maximum thickness of this salt body is about 95 feet (pl. 5).

Underlying the upper salt body is a seam of finely to coarsely laminated dense moist generally black clay and marl. This is known as the "parting mud," and it averages about 12 feet thick. Within the parting mud are seams containing disseminated crystals of gaylussite or pirsomite. X-ray determinations of certain laminae have shown them to contain halite, aragonite, and dolomite; possibly much of the parting mud consists of these minerals. Borax occurs at some places within the parting mud in the form of seams, veins, and disseminated crystals.

In general, the parting mud is high in organic matter and contains coprolitic pellets, pollen grains, and fragments of unidentified organic matter (W. H. Bradley, written communication, 1955).

Underlying the parting mud seam is a second major salt body known as the "lower salt," "lower structure," or "lower crystal body," which has a maximum thickness of about 54 feet (pl. 6). The lower salt differs from the upper salt in containing more clay and marl seams; by the presence of burkeite and northupite, which are either absent or scarce in the upper salt body; and by a virtual lack of hanksite, which is abundant in the upper salt body. The lower salt body is also characterized by the presence, near its base, of tychite and schairerite.

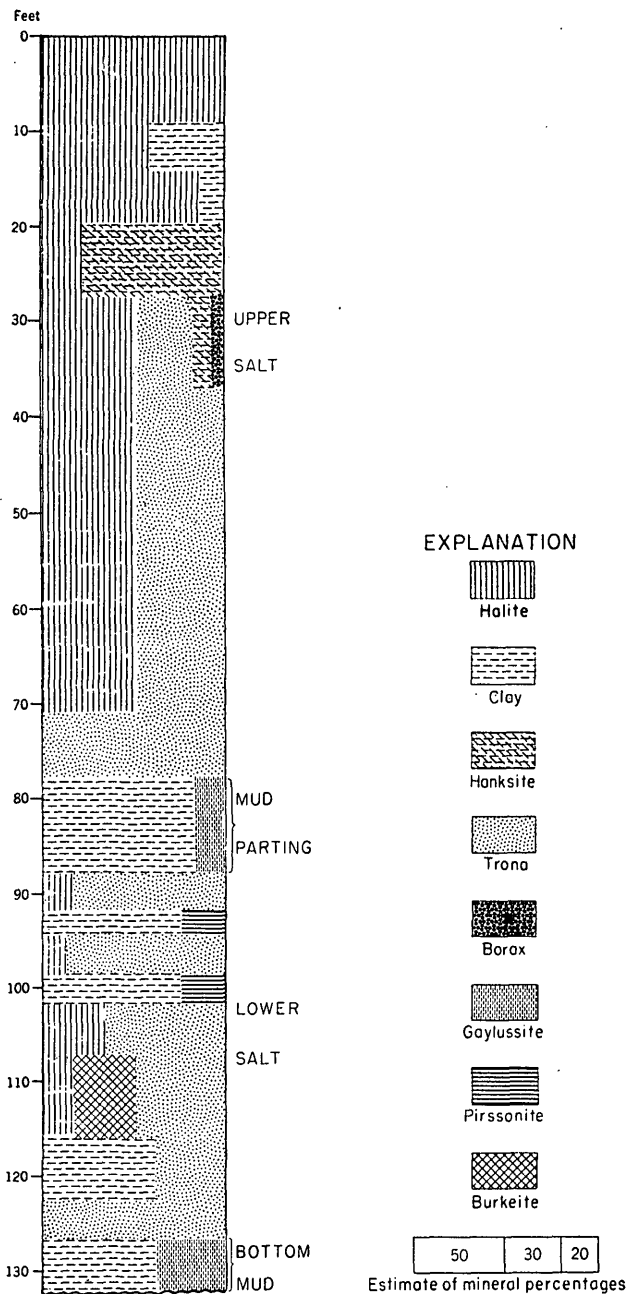


FIGURE 7.—Generalized graphic core log of mineral data from holes GS-14, GS-15, and GS-16.

A finely laminated clay containing disseminated gaylussite crystals immediately underlies the lower salt body. This clay, together with various seams of trona, halite, and other minerals found at deeper horizons, is known as the "bottom mud" and comprises the remainder of the lake fill to a known depth of 875 feet. The bottom mud to this depth is described in a report by Smith and Pratt (1957). Geophysical surveys indicate that the lake fill reaches a total depth of about 3,300 feet beneath the surface (Mabey, 1956).

BRINE

Permeating the pore spaces, vugs, and cavities of both the upper salt and lower salt bodies is a stratified brine having a specific gravity between 1.24 and 1.34, a salinity between 34 and 36 percent, and a pH from 9.1 to 9.4. The constituents of the brine, in addition to the water, are chiefly chlorine, sodium, sulfate, bicarbonate and carbonate, potassium, and borate in order of decreasing concentration by weight in the upper salt; minor amounts (less than 0.5 percent) of strontium, phosphorus, bromine, arsenic, tungsten, lithium, fluorine, ammonia, iron and aluminum oxides, iodine, and antimony, in approximate order of decreasing concentration by weight, are also present. Calcium and magnesium are not present in detectable amounts. The brines in each salt body are prevented from mixing with each other by the impermeable parting mud seam. These brines differ in their chemical character, the lower salt brine containing a higher percentage of borate and bicarbonate and a lower percentage of potassium than the upper salt brine. Measurements of brine temperatures made by the American Potash & Chemical Corp. indicate that the brine near the base of the upper salt body remains between 73°F (22.7°C) and 76°F (24.5°C) throughout the year.

The total porosity of the upper salt body is approximately 44 percent (J. M. Fox, C. F. Ritchie, and E. J. Watson, American Potash and Chemical Corp., written communication 1935). No measurements of porosity within the lower salt body have been made, but a visual comparison with the upper salt suggests a similar value. In general, the highest commercial grade of brine occurs at the base of the upper salt in the central part of the lake; lower grade brine occurs at the surface and on the margins of the salt bodies.

Gas pockets are commonly present in the salt bodies just above the parting mud seam and the bottom mud. This gas is combustible and consists of methane or a similar compound, ammonia, and hydrogen sulfide. The pressure exerted by this gas is sufficient, in some places, to force brine from the hole several feet into the air and maintain a vigorous flowage for several hours.

Brine from both upper and lower salt bodies is pumped into plants

located at Trona and Westend. Sodium carbonate, sodium sulfate, potassium chloride, borax, lithium carbonate, bromine, and phosphoric acid are produced at Trona (Ryan, 1951); sodium carbonate, sodium sulfate, and borax are produced at Westend. No solid minerals are mined, except the winter crop of mirabilite which is derived from brine and a small tonnage of halite which is scraped from the surface and shipped to local users.

DRILLING METHODS

From July 1954 to November 1955, 41 holes were drilled on Searles Lake. Core drilling was done by a private contractor for the U. S. Geological Survey who used several types of portable rotary-drill rigs equipped with pneumatic tires and "A" rods. For most of the drilling, only 1 drill was in operation at a time, except for a period of 6 months when 2 drills were operating simultaneously.

Because of the porous and friable nature of much of the salt, special equipment was used in coring. This consisted of steel core barrels having a diameter of 10 inches and serrated at one end with teeth reinforced with "stoddite" alloy; the core barrels ranged in length from 2 to 4 feet. During drilling, the bit is cooled by the lake brine which permeates the salt body; no additional circulating fluids are needed. Ryan (1951) has described in detail the drilling methods used.

No attempt was made to core the overburden mud; descriptions of this body in the core logs were obtained chiefly from cuttings. Holes located in areas covered with overburden mud were drilled with the following procedure: The overburden mud is first reamed with a cutting tool having a maximum diameter of 15 inches. The resulting hole is about 16 inches across. As the overburden mud is reamed, successive lengths of casing, 16 inches in diameter, are inserted to prevent caving. Reaming is continued until brine begins to enter the hole, indicating that the hole is at, or near the top of, the upper salt body. The casing is pounded down by means of a heavy drop hammer until it is firmly embedded in the resistant top of the upper salt body. Casing, 10 inches in diameter, with casing guides welded at the sides, is then lowered into the hole temporarily and joined to the 16-inch casing at the top of the hole by a circular 16-inch plate containing a hole 10 inches in diameter in its center. The core barrel can then be lowered through this 10-inch casing; the casing serves as a guide for the cutting tool. Coring is continued until the core barrel becomes filled and plugged with core. After removing the core, which has a diameter near 9½ inches, coring is continued in this manner until the entire upper salt body has been cored; in addition, coring continues for 2 or 3 feet into the parting mud seam.

The core barrel and 10-inch casing are then removed, and the reamer inserted again into the hole to widen it to 16-inch diameter to form a collar at the top of the parting mud seam which will later hold a cement plug designed to prevent the upper and lower salt brines from mixing. After reaming, the chips are removed by compressed air and the 10-inch casing reinserted in the hole; additional lengths of casing are welded in place until the casing reaches the depth cored. Coring is then resumed through the parting mud and the lower salt bodies. The casing temporarily prevents the upper and lower salt brines from mixing during the coring operations.

On completion of the hole, a pipe 3 inches in diameter, equipped with a circular rubber flange, 10 inches in diameter, near the base, is lowered into the hole through the 10-inch casing until the flange lies at the base of the parting mud. Cement is then pumped into the hole between the 10-inch casing and the 3-inch pipe; the rubber flange at the base of the pipe supports the cement, which is filled to the top of the parting mud seam. The 10-inch casing is then removed from the hole. After hardening, the cement forms a seal in the parting mud which prevents mixing of the upper and lower salt brines. Holes were left open for future sampling. The lower salt brine can be sampled by lowering a rubber hose through the 3-inch pipe; the upper salt brine can be sampled in the uncased upper part of the hole. The foregoing method of drilling was used in the majority of holes drilled for the Geological Survey, though minor modifications were adopted where necessary.

The average depth of the 29 "deep" holes is 103 feet; 12 additional "shallow" holes were drilled to depths of about 30 feet. The deeper holes penetrated both salt bodies and extended several feet into the bottom mud. The shallower holes tested the upper part of the upper salt body for the occurrence of near-surface crystalline borax.

CORE LOGS

The detailed written core logs included in this report represent logs from holes selected on the basis of location, contrasting mineralogy, and number of chemical analyses performed on core and brine samples. The core logs contain descriptions of the minerals, state of consolidation, color, texture, grain sizes and crystal forms, and percentages of each mineral, wherever possible, as observed in the 9 $\frac{1}{8}$ -inch core shortly after recovery, and while still moist.

The percentage of minerals present are estimates made by visual inspection of the core. The terms "well-consolidated," "friable," and "poorly consolidated" are relative terms used to indicate the state of consolidation. If the core is not easily crumbled or deformed by hand, the term "well-consolidated" is used; core easily disaggre-

gated into individual crystals is described as "friable"; core consisting of soft plastic aggregates or virtually unconsolidated material is described as "poorly consolidated."

The term "fractured core" refers to core recovered in fragments as a result of fracturing during drilling.

About 300 mineral determinations were made by Robert D. Allen, of the U. S. Geological Survey, using immersion oils and the petrographic microscope. These determinations are denoted in the core logs by an asterisk (*) following the mineral identified. Several determinations made by X-ray diffraction methods are denoted in the core logs by two asterisks (**) following the mineral so identified.

Sediment names are in accord with those suggested by Wentworth (1922).

Colors have been named and numbered according to the "Rock-Color Chart" distributed by the Geological Society of America in 1951. All colors refer to the color of the core when wet or moist, and generally in sunlight.

Sizes of nonequidimensional minerals, as hanksite, were measured in the direction of the longest dimension.

If core recovery on any given run was not 100 percent, the recovered core was arbitrarily placed in the upper end of the run and the missing portion was placed at the bottom, except where evidence for other distribution is present.

Between runs, material commonly caved from the walls higher in the section. The caved materials recovered in the core barrel were saved and included in the log, but they have been designated as "probably cuttings, not core" wherever the combination of poor compaction and position at the top of the run have suggested the above origin.

Megascopic fossils were sought throughout the core, but none were found except a few twigs and roots embedded in clay seams.

GRAPHIC LOGS

COMPILATION OF LOGS

The 41 drill holes shown on plates 5 and 6 are represented by a series of graphic logs (pls. 7, 8), which have been compiled from the written core logs at a scale which requires some generalization of the core descriptions. To allow for legibility no seams less than 0.5 foot in thickness nor any mineral percentage less than 10 percent are shown on the graphic logs. In preparing the graphic logs from the data in the written core logs, seams less than 0.5 foot have been combined with seams immediately adjacent until a minimum thickness of 0.5 foot is obtained. In such cases, the mineral percentages in each seam have been combined and properly weighted according to the

thickness of each seam combined. The thickness and weighted mineral percentages were then plotted on the graphic log. Recovered core is shown on the graphic logs by a black outline; core lost or partly recovered in fragmentary form is not outlined.

Research on the chemical composition, mineralogy, and distribution of the lake beds is in progress. The formations present in the lake have not been named by standards of the U. S. Geological Survey nor have their boundaries been defined. Cross sections through the saline deposit and correlations of strata across the lake are in preparation.

LOST CORE

During drilling, core may be "lost" in several ways, as follows:

1. Certain strata within the salt bodies, especially the hanksite zone in the upper salt, contain cavities of various sizes, some of which may be a foot or more in diameter (pl. 9). In drilling through such a zone, if there was not enough surrounding material to preserve the cavity enclosed in the core barrel, the structure collapsed and the consequent interval was considered as "lost" core.

2. Throughout most of the salt bodies there exist smaller interstitial openings with the saline minerals loosely consolidated. During drilling, the pressure applied to the core barrel is sufficient, in some places, to compact this core; this also results in "lost" core. In methods 1 and 2, the "lost" core is apparent, not real.

3. Core may actually be destroyed by grinding, and the ground material washed into cavities at the sides of the hole or at the bottom. This method of loss was particularly common in the soft beds of trona, especially the thick bed at the base of the upper salt body (pl. 10). The "mushy" character of this zone permits it to be easily compacted and ground away.

The sections of the graphic logs designated as lost core are estimates of the material lost. In most cores, it is difficult or impossible to determine accurately the type of loss and the materials lost, though little doubt exists within the vuggy hanksite zone (pl. 9) in the upper salt, and in the soft massive trona seam at the base of the upper salt (pl. 10). The mineral composition and percentages in lost core have been estimated by taking the above factors into consideration, by noting the character of core recovered just above and below the lost section, and by noting the character of core in holes nearby at approximately the same horizon.

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CORE FROM HOLE GS-26

Vuggy aggregate of hanksite crystals typical of hanksite zone in upper salt body.



CORE FROM HOLE GS-21

White massive trona with discolored seams (a) in contact with top of dark "parting mud" (b).

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CORE LOGS

Searles drill hole GS-1

LOCATION: Searles Lake, Calif., sec. 10, T. 25 S., R. 43 E., Mount Diablo base line and meridian, about 1,580 ft S. 9° W. of common cor., secs. 2, 3, 10, and 11.

ELEVATION AT TOP OF HOLE: 1,621 ft.

ELEVATION AT BOTTOM OF HOLE: 1,528.2 ft.

TOTAL DEPTH: 92.8 ft.

DATE OF DRILLING: July 13-26, 1954.

CASING USED: 51 ft of 10-in. casing; 30 ft of 16-in. casing.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 8.0 | 8.0 | Overburden mud, not cored. Moderately yellowish-brown (10YR 6/4) tenacious clay, locally silty. |
| 16.0 | 8.0 | Overburden mud, not cored. Dusky yellow-green (5GY 5/2) clay, locally silty. |
| 28.2 | 12.2 | Overburden mud, not cored. Black (N 1) tenacious clay ("gumbo") with 3-in. halite seam at 25.8 ft; 2 percent loose disseminated halite crystals from 20 to 25.8 ft; 6 percent loose disseminated halite crystals from 25.8 to 28.2 ft. |
| 29.1 | .9 | Clay and halite. Black (N 1) clay with 20 percent disseminated colorless halite crystals from 2 to 75 mm. |
| 29.6 | .5 | Halite* and trona. Well-consolidated slightly vuggy aggregate of colorless halite crystals from 1 to 4 mm in length discolored dark gray (N 3) by clay; trace of fibrous trona disseminated throughout. |
| 30.1 | .5 | Halite*. Poorly consolidated aggregate of halite cubes modified by octahedron with thin black (N 1) clay streaks. |
| 30.8 | .7 | Halite and trona. Well-consolidated aggregate of halite crystals averaging 2 mm in length, with 5 percent interstitial colorless fibrous trona; halite discolored by trace of interstitial black (N 1) clay. |
| 31.2 | .4 | Halite. Poorly consolidated aggregate of halite crystals up to 4 mm in length. |
| 31.4 | .2 | Clay. Black (N 1) clay. |
| 31.9 | .5 | Halite. Poorly consolidated aggregate of halite crystals up to 4 mm in length; 2 percent hanksite crystals disseminated throughout. |
| 35.6 | 3.7 | No core. |
| 36.0 | .4 | Hanksite and clay. Poorly consolidated aggregate of hanksite crystals up to 15 mm in length, with a few fragments of granular massive hanksite; 25 percent interstitial black (N 1) clay; trace of interstitial trona. |
| 36.4 | .4 | Hanksite and trona. Well-consolidated aggregate of hanksite crystals averaging 10 mm in length; pockets of fibrous trona in vugs. Hanksite 97 percent, trona 3 percent. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 36.9 | 0.5 | Hanksite, trona, and clay. Well-consolidated aggregate of hanksite crystals cemented by black (N 1) clay; pockets of fibrous trona. Hanksite 90 percent, trona 5 percent, clay 5 percent. |
| 37.6 | .7 | Trona. Fractured core. Fragments of light gray (N 7) to white (N 9) trona 2-8 cm across, with much interstitial soft unconsolidated massive trona. |
| 44.2 | 6.6 | No core. |
| 44.5 | .3 | Trona. Soft unconsolidated massive trona, discolored black (N 1) by trace of intermixed clay. |
| 44.8 | .3 | Trona. Well-consolidated massive trona discolored medium light gray (N 6) by trace of intermixed clay. |
| 45.6 | .8 | Trona. Well-consolidated white (N 9) to very light gray (N 8) massive trona. |
| 45.8 | .2 | Trona. Well-consolidated light olive-gray (5Y 6/1) hard massive trona. |
| 46.0 | .2 | Clay and trona. Black (N 1) tenacious clay with seams of white (N 9) massive trona. Clay 50 percent, trona 50 percent. |
| 47.4 | 1.4 | Clay and pirssonite*. Black (N 1) to grayish olive-green (5GY 3/2) dense clay, with closely spaced thin laminations of moderate yellowish-brown (10YR 5/4) to medium light-gray (N 6) to very light gray (N 8) clay; disseminated crystals of pirssonite* ranging from 2 to 10 mm in length. Clay 95 percent, pirssonite 5 percent. |
| 47.6 | .2 | No core. |
| 47.7 | .1 | Clay, pirssonite*, and borax. Black (N 1) to dark-gray (N 3) dense finely laminated clay with 30 percent disseminated pirssonite* crystals up to 10 mm in length; 10 percent borax crystals from 5 to 10 mm in length. |
| 48.4 | .7 | Clay and pirssonite*. Grayish olive-green (5GY 3/2) to black (N 1) dense clay with fine laminations of greenish and grayish clay; 10 percent disseminated crystals of pirssonite averaging 10 mm in length. |
| 49.6 | 1.2 | Clay and aragonite. Black (N 1) dense clay with a few widely spaced laminae of white (N 9) to dark greenish-gray (5GY 2/1) soft massive aragonite. Clay 95 percent, aragonite 5 percent. |
| 51.2 | 1.6 | Clay and aragonite. Black (N 1) dense clay, coarsely laminated in upper 0.9 ft, finely laminated in lower 0.7 ft, with laminae of white (N 9) to dark greenish-gray (5GY 4/1) soft massive aragonite less than 1 mm wide. Clay 95 percent, aragonite 5 percent. |
| 51.6 | .4 | Clay, aragonite, and pirssonite*. Black (N 1) dense clay with fine laminae of white (N 9) to dark greenish-gray (5GY 4/1) to grayish olive-green (5GY 3/2) soft massive finely crystalline aragonite; 25 percent pirssonite* crystals averaging 3 mm in length disseminated throughout. |
| 52.3 | .7 | No core. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 52.5 | 0.2 | Clay and pirssonite*. Olive-gray (5Y 3/2) to black (N 1) dense clay, with seams, 0.05 to 1.5 mm thick of disseminated pirssonite* crystals. Clay 50 percent, pirssonite* 50 percent. |
| 56.2 | 3.7 | Clay and gaylussite. Grayish olive-green (5GY 3/2) to grayish-black (N 2) to black (N 1) dense finely laminated clay with scattered pockets and streaks of disseminated anhedral gaylussite up to 12 cm in length. Clay 85 percent, gaylussite 15 percent. |
| 56.3 | .1 | No core. |
| 58.3 | 2.0 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) to dark-gray (N 3) dense coarsely laminated clay revealed by color differences; 5 percent gaylussite in scattered pockets ranging from 1 to 3 cm in length; seam of light-brown (5 YR 5/6) algae(?)-discolored clay 3 mm wide at 58.0 ft. |
| 60.1 | 1.8 | Clay. Black (N 1) dense clay. |
| 61.2 | 1.1 | No core. |
| 61.4 | .2 | Clay and gaylussite*. Black (N 1) dense clay with 25 percent disseminated crystals of gaylussite averaging 2 mm in length. |
| 61.6 | .2 | Clay. Black (N 1) dense clay; very few disseminated crystals. |
| 61.8 | .2 | Clay and gaylussite. Black (N 1) dense clay with 50 percent disseminated gaylussite crystals averaging 2 mm in length. |
| 62.0 | .2 | Clay. Black (N 1) dense clay. |
| 62.1 | .1 | Gaylussite and clay. Consolidated aggregate of gaylussite crystals averaging 5 mm in length with 25 percent interstitial black (N 1) clay. |
| 62.9 | .8 | Clay. Black (N 1) dense clay. |
| 63.3 | .4 | Clay and gaylussite. Black (N 1) dense clay with 50 percent disseminated gaylussite crystals averaging 2 mm in length. |
| 63.7 | .4 | Clay. Black (N 1) dense clay. |
| 64.4 | .7 | Clay and gaylussite. Black (N 1) dense clay with 30 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 64.9 | .5 | Clay. Black (N 1) dense clay with a few thin seams of gaylussite silt. |
| 65.0 | .1 | Clay and gaylussite. Black (N 1) dense clay with 30 percent disseminated gaylussite sand. |
| 65.1 | .1 | Trona. Loosely consolidated fibrous trona locally discolored dark gray (N 3) by clay, with pockets of white (N 1) massive trona. Trona 95 percent, clay 5 percent. |
| 65.3 | .2 | No core. |
| 65.6 | .3 | Trona and clay. Fragments of fibrous trona mixed with black (N 1) clay. Probably cuttings, not core. Clay 95 percent, trona 5 percent. |
| 65.7 | .1 | Trona and clay. Well-consolidated seams of white (N 9) massive trona with seams of black (N 1) clay. Trona 80 percent, clay 20 percent. |
| 65.9 | .2 | Clay. Black (N 1) dense clay. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 67.9 | 2.0 | Clay and gaylussite. Black (N 1) dense clay with 25 percent disseminated gaylussite crystals from 2 to 10 mm in length. |
| 68.4 | .5 | Clay. Black (N 1) dense clay. |
| 69.2 | .8 | Trona. Well-consolidated white (N 1) massive trona. |
| 69.4 | .2 | No core. |
| 70.0 | .6 | Trona. Hard vuggy massive trona discolored dark-gray (N 3) to grayish-green (10G 4/2) by trace of intermixed clay. |
| 72.0 | 2.0 | Trona. Well-consolidated white (N 9) to dark-gray (N 3) to light-brown (5YR 6/4) trona, discolored by trace of intermixed clay. |
| 72.4 | .4 | Clay and gaylussite. Black (N 1) dense clay with 5 percent disseminated gaylussite crystals averaging 1 mm in length. |
| 72.5 | .1 | Clay and gaylussite. Black (N 1) dense clay with 75 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 73.3 | .8 | Clay and gaylussite. Black (N 1) dense clay with 35 percent disseminated gaylussite crystals 3 to 5 mm in length. |
| 73.9 | .6 | No core. |
| 74.6 | .7 | Clay and gaylussite*. Poorly consolidated soft olive-gray (5Y 3/2) to black (N 1) clay with 50 percent disseminated gaylussite* crystals from 1 to 2 mm in length, averaging 10 mm. |
| 75.3 | .7 | Clay and gaylussite. Black (N 1) dense clay with 25 percent disseminated gaylussite crystals from 5 to 10 mm in length. |
| 76.2 | .9 | Clay. Black (N 1) dense clay. |
| 76.8 | .6 | Trona. Greenish-gray (5GY 6/1) to grayish-black (N 2) massive trona, discolored by trace of intermixed clay; large colorless trona blades averaging 10 mm in length in upper 0.1 ft. |
| 77.0 | .2 | Clay. Black (N 1) dense clay. |
| 77.8 | .8 | Trona. White to greenish-gray (5GY 6/1) to grayish-black (N 2) dense hard massive trona; trace of fibrous trona in lower 0.2 ft. |
| 78.8 | 1.0 | No core. |
| 79.2 | .4 | Trona. Colorless to white (N 9) fibrous trona locally discolored grayish black (N 2) to medium gray (N 5) by trace of interstitial clay. |
| 79.6 | .4 | Clay. Black (N 1) to light-gray (N 7) to white (N 9) dense finely laminated clay; 2 moderate reddish-brown (10R 4/6) algae(?) -discolored laminae in lower 0.1 ft about 1 mm wide. |
| 79.8 | .2 | Trona. Well-consolidated moderate reddish-brown (10R 4/6) to dark-gray (N 3) to greenish-gray (5GY 6/1) to light olive-gray (5Y 6/1) fibrous trona. |
| 80.5 | .7 | Clay. Black (N 1) to grayish-olive (10Y 4/2) to light-gray (N 7) dense finely laminated clay. |
| 80.6 | .1 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) dense clay with 50 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 80.9 | .3 | Clay and gaylussite. Black (N 1) clay with 50 percent disseminated gaylussite crystals from 1 to 3 mm in length. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 81. 8 | 0. 9 | Clay. Black (<i>N</i> 1) dense clay; 3 faint seams averaging 1 mm wide of moderate reddish-brown (10 <i>R</i> 4/6) algae(?) -discolored clay and 1 contorted seam 5 mm wide of moderate reddish-orange (10 <i>R</i> 6/6) algae(?) -discolored clay. |
| 81. 9 | . 1 | Trona. Densely packed aggregate of trona blades averaging 10 mm in length; core fractured and obscured. |
| 82. 1 | . 2 | Clay. Black (<i>N</i> 1) dense clay. |
| 84. 2 | 2. 1 | No core. |
| 84. 5 | . 3 | Clay. Black (<i>N</i> 1) to grayish-olive (10 <i>Y</i> 4/2) to greenish-gray (5 <i>GY</i> 6/1) dense finely laminated clay. |
| 84. 8 | . 3 | Clay and gaylussite. Black (<i>N</i> 1) dense clay with 50 percent disseminated gaylussite crystals from 1 to 2 mm in length. |
| 86. 0 | 1. 2 | Trona. Well-consolidated aggregate of coarse bladed trona with interstitial soft massive trona and trace of clay. |
| 86. 9 | . 9 | Clay and tychite. Black (<i>N</i> 1) to grayish-olive (10 <i>Y</i> 4/2) to medium light-gray (<i>N</i> 6) dense finely laminated clay; a few seams 4 mm wide of disseminated tychite octahedrons less than 1 mm in diameter. Clay 99 percent, tychite 1 percent. |
| 87. 7 | . 8 | Clay and gaylussite. Black (<i>N</i> 1) dense clay with 50 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 87. 9 | . 2 | Clay and gaylussite. Black (<i>N</i> 1) dense clay with 50 percent disseminated gaylussite sand. |
| 88. 3 | . 4 | Clay. Black (<i>N</i> 1) dense clay. |
| 88. 4 | . 1 | No core. |
| 88. 8 | . 4 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-olive (10 <i>Y</i> 4/2) clay with seams, from 3 to 4 mm wide, of disseminated gaylussite sand. |
| 89. 0 | . 2 | Trona. Well-consolidated medium-gray (<i>N</i> 5) massive trona; discolored by trace of intermixed clay. |
| 92. 5 | 3. 5 | Clay and gaylussite. Dark greenish-gray (5 <i>GY</i> 4/1) and 5 <i>G</i> 4/1) to light-gray (<i>N</i> 7) to light-brown (5 <i>YR</i> 5/6) to dusky yellow (5 <i>Y</i> 6/4) to black (<i>N</i> 1) dense finely laminated clay with 20 percent disseminated gaylussite crystals from 5 to 10 mm in length. |
| 92. 8 | . 3 | No core. |

Searles drill hole GS-2

LOCATION: Searles Lake, Calif., about 300 ft east of east $\frac{1}{4}$ sec. cor., secs. 24 and 25, T. 25 S., R. 43 E., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,617 ft.

ELEVATION AT BOTTOM OF HOLE: 1,509.7 ft.

TOTAL DEPTH: 107.3 ft.

DATE OF DRILLING: July 26 to Aug. 6, 1954.

CASING USED: 73 ft of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 0. 1 | 0. 1 | Halite. Well-consolidated porous aggregate of white (<i>N</i> 9) to colorless halite crystals averaging 3 mm in length. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 0.3 | 0.2 | Halite and clay. Well-consolidated porous aggregate of colorless to white (<i>N</i> 9) halite crystals averaging 3 mm in length, with 5 percent interstitial light olive-gray (<i>5Y</i> 5/2) to grayish-olive (<i>10T</i> 4/2) clay. |
| .5 | .2 | Halite and clay. Poorly consolidated porous aggregate of halite anhedral with 5 percent interstitial grayish-olive (<i>10Y</i> 4/2) clay. |
| 1.0 | .5 | Halite. Poorly consolidated porous aggregate of subhedral halite cubes 3-5 mm in diameter; 2 percent interstitial grayish-olive (<i>10Y</i> 4/2) clay. |
| 1.2 | .2 | Clay and halite. Dark greenish-gray (<i>5GY</i> 4/1) clay with loose disseminated anhedral halite crystals and rounded octahedra up to 5 cm in length. Clay 75 percent, halite 25 percent. |
| 2.4 | 1.2 | Clay and halite. Greenish-gray (<i>5GY</i> 6/1 to <i>5G</i> 6/1) clay with 50 percent disseminated anhedral to subhedral halite crystals showing octahedral faces from 1 to 5 cm in length, averaging 25 mm. |
| 3.0 | .6 | Borax, halite, and clay. Greenish-gray (<i>5GY</i> 6/1 to <i>5G</i> 6/1) clay with large disseminated subhedral borax crystals up to 10 cm, averaging 6 cm; small octahedral and cubic halite crystals 3 mm in length are also disseminated in the clay. Borax 50 percent, clay 40 percent, halite 10 percent. |
| 3.3 | .3 | Clay and hanksite. Unconsolidated black (<i>N</i> 1) soft clay with 20 percent disseminated euhedral hanksite crystals averaging 5 mm in length. |
| 3.8 | .5 | No core. |
| 4.0 | .2 | Halite, hanksite, and borax. Unconsolidated aggregate of anhedral halite with a few crystals showing octahedral faces, averaging 10 mm in length; 30 percent intermixed hanksite crystals averaging 10 mm in length; 10 percent borax fragments 25 mm in length. Probably cuttings, not core. |
| 4.2 | .2 | Halite and clay. Well-consolidated anhedral halite with 10 percent interstitial black (<i>N</i> 1) to greenish-black (<i>5G</i> 2/1) clay. |
| 5.6 | 1.4 | Halite and clay. Well-consolidated aggregate of subhedral halite crystals averaging 10 mm in length, with 40 percent interstitial black (<i>N</i> 1) clay. |
| 6.1 | .5 | Hanksite and clay. Well-consolidated aggregate of euhedral hanksite crystals averaging 10 mm in length, with 10 percent interstitial black (<i>N</i> 1) clay. |
| 7.0 | .9 | No core. |
| 7.3 | .3 | Halite and clay. Well-consolidated anhedral halite crystals averaging 10 mm in length, with 50 percent interstitial black (<i>N</i> 1) clay; a few octahedra. |
| 7.5 | .2 | Halite and borax. Unconsolidated anhedral halite crystals averaging 10 mm in length, with 10 percent disseminated borax crystals up to 50 mm in length, averaging 25 mm. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 8.6 | 1.1 | Clay and halite. Well-consolidated grayish-black (N 2) clay with 20 percent disseminated anhedral halite crystals averaging 20 mm in length. |
| 8.8 | .2 | Clay, halite, and borax. Unconsolidated grayish-black (N 2) soft clay with 25 percent disseminated halite crystals averaging 10 mm in length and 15 percent euhedral borax crystals averaging 20 mm in length; a few borax crystals coated with layer of pirssonite* and clay* 1 mm thick. |
| 9.3 | .5 | Halite and clay. Well-consolidated aggregate of halite crystals averaging 10 mm in length, with 20 percent interstitial black (N 1) to grayish-black (N 2) clay; prominent clay inclusions in halite. |
| 10.1 | .8 | Borax, halite, and clay. Poorly consolidated aggregate of euhedral borax crystals from 10 to 50 mm in length, averaging 25 mm; 15 percent disseminated halite cubes 5 to 10 mm in length with scattered subhedral halite octahedra; 5 percent interstitial grayish-black (N 2) clay. |
| 10.8 | .7 | Halite and clay. Well-consolidated grayish-black (N 2) clay with 60 percent disseminated anhedral halite crystals averaging 12 mm in length; a few halite cubes and subhedral octahedra. |
| 11.0 | .2 | No core. |
| 13.1 | 2.1 | Clay, halite, and borax. Poorly consolidated grayish-black (N 2) clay with disseminated aggregate of halite cubes and cubes modified by octahedron with individual disseminated crystals of halite averaging 10 mm in length; 10 percent disseminated anhedral borax crystals 50 to 100 mm in length; single crystal of hanksite. Clay 50 percent, halite 40 percent, borax 10 percent. |
| 13.2 | .1 | No core. |
| 14.0 | .8 | Trona. Dark-gray (N 3) soft massive trona. |
| 14.6 | .6 | Halite and clay. Unconsolidated to friable aggregate of anhedral halite crystals up to 50 mm in length, averaging 15 mm, 5 percent interstitial dark gray (N 3) clay. |
| 17.6 | 3.0 | No core. |
| 17.9 | .3 | Halite and trona. Dark-gray (N 3) soft massive trona containing disseminated anhedral to subhedral halite crystals and aggregates of halite crystals from 2 to 7 cm in length. Halite 50 percent, trona 50 percent. |
| 18.1 | .2 | Halite and hanksite. Well-consolidated massive halite with 40 percent disseminated hanksite crystals from 10 to 25 mm in length. |
| 18.9 | .8 | Hanksite, trona, and halite. Unconsolidated mixture of soft massive trona, hanksite crystals from 10 to 25 mm in length, and anhedral halite crystals up to 50 mm in length, averaging 10 mm. Hanksite 60 percent, trona 25 percent, halite 15 percent. |
| 19.2 | .3 | Hanksite and halite. Well-consolidated aggregate of euhedral hanksite crystals averaging 15 mm in length, with 20 percent interstitial anhedral halite crystals. |
| 20.5 | 1.3 | No core. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 20.9 | 0.4 | Hanksite and borax. Well-consolidated to unconsolidated hanksite crystals averaging 15 mm in length, with 50 percent intermixed massive borax. |
| 22.9 | 2.0 | Hanksite, borax, and trona. Well-consolidated mixture of anhedral to subhedral borax and hanksite crystals with streaks and pockets of soft white (<i>N</i> 9) massive trona. Hanksite 65 percent, borax 30 percent, trona 5 percent. |
| 23.5 | .6 | Borax, clay, and trona. Well-consolidated aggregate of borax crystals averaging 25 mm in length, with 3 percent interstitial olive-black (<i>5Y</i> 2/1) clay; 2 percent fibrous trona in vugs. |
| 24.5 | 1.0 | Borax and hanksite. Well-consolidated fractured aggregate of anhedral, subhedral, and massive borax; a few disseminated hanksite crystals averaging 10 mm in length. Borax 95 percent, hanksite 5 percent. |
| 24.6 | .1 | No core. |
| 25.1 | .5 | Borax and hanksite. Well-consolidated aggregate of borax crystals averaging 10 mm in length, with disseminated anhedral to euhedral hanksite crystals averaging 10 mm in length. Borax 90 percent, hanksite 10 percent. |
| 25.7 | .6 | Borax and halite. Well-consolidated aggregate of borax crystals averaging 35 mm in length, with 5 percent disseminated halite crystals; trace of soft massive trona in upper 0.1 ft; small amount of black (<i>N</i> 1) clay in interstices of borax crystals. |
| 26.2 | .5 | Halite and borax. Well-consolidated massive halite with scattered vugs containing borax crystals from 5 to 10 mm in length; traces of clay. Halite 95 percent, borax 5 percent. |
| 26.4 | .2 | Hanksite, clay, and borax. Well-consolidated greenish-black (<i>5GY</i> 2/1) clay with disseminated hanksite and borax crystals averaging 25 mm in length. Hanksite 60 percent, clay 30 percent, borax 10 percent. |
| 28.0 | 1.6 | Halite and trona. Medium-gray (<i>N</i> 6) to white (<i>N</i> 9) granular massive halite with narrow streaks, lenses, and pockets of dark yellowish-orange (<i>10YR</i> 6/6) fibrous trona. Halite 80 percent, trona 20 percent. |
| 30.6 | 2.6 | No core. |
| 31.6 | 1.0 | Halite, trona, and clay. Friable vuggy aggregate of subhedral halite crystals averaging 10 mm in length, with 1 percent interstitial black (<i>N</i> 1) clay; 1 percent interstitial soft massive trona. |
| 31.9 | .3 | Halite, trona, and clay. Well-consolidated aggregate of halite crystals with 15 percent interstitial dark greenish-gray (<i>5G</i> 4/1) to dark-gray (<i>N</i> 3) to dark yellowish-orange (<i>10YR</i> 6/6) soft massive trona; 5 percent black (<i>N</i> 1) clay in interstices of halite and mixed with trona. Halite 80 percent, trona 15 percent, clay 5 percent. |
| 32.6 | .7 | Halite. Well-consolidated slightly vuggy aggregate of grayish-yellow (<i>5Y</i> 8/4) to white (<i>N</i> 9) halite crystals averaging 1 mm in length; traces of colorless fibrous trona. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 32.7 | 0.1 | Halite, trona, and clay. Well-consolidated aggregate of halite crystals with 5 percent interstitial dark greenish gray (5G 4/1) to dark-gray (N 3) to dark yellowish-orange (10YR 6/6) soft massive trona; black (N 1) clay in interstices of halite and mixed with trona. Halite 90 percent, trona 5 percent, clay 5 percent. |
| 33.3 | .6 | Halite. Well-consolidated aggregate of colorless to white (N 9) halite crystals averaging 1 mm in length, locally stained grayish-yellow (5Y 8/4). |
| 33.5 | .2 | Halite, trona, and clay. Same as unit 32.6 to 32.7 ft. |
| 33.7 | .2 | Trona. Unconsolidated white (N 9) soft massive trona. |
| 34.3 | .6 | No core. |
| 34.7 | .4 | Halite, hanksite, and clay. Poorly consolidated aggregate of white (N 9) halite cubes and anhedra averaging 2 mm in length; a few fragments of hanksite about 10 mm in length; traces of interstitial black (N 1) clay. May be cuttings, not core. Halite 98 percent, hanksite 1 percent, clay 1 percent. |
| 34.9 | .2 | Halite and hanksite. Well-consolidated slightly vuggy aggregate of white (N 9) halite crystals averaging 5 mm in length; hanksite crystals from 10 to 50 mm in length at base. Halite 90 percent, hanksite 10 percent. |
| 35.3 | .4 | No core. |
| 35.5 | .2 | Trona and halite. Unconsolidated greenish-gray (5GY 6/1) soft trona mixed with 20 percent halite anhedra averaging 2 mm in length. Probably cuttings, not core. |
| 36.0 | .5 | Halite. Unconsolidated white (N 9) halite fragments averaging 2 mm in length. |
| 36.1 | .1 | Halite. Well-consolidated aggregate of colorless to white (N 9) halite crystals averaging 3 mm in length. |
| 36.5 | .4 | Hanksite. Well-consolidated light olive-gray (5Y 6/1) to pale yellowish-brown (10YR 6/2) massive hanksite. |
| 36.8 | .3 | Hanksite. Dense vuggy aggregate of hanksite crystals averaging 10 mm in length. |
| 36.9 | .1 | Halite. Well-consolidated aggregate of colorless to white (N 9) halite crystals averaging 10 mm in length. |
| 37.0 | .1 | Trona. Well-consolidated white (N 9) to pale yellowish-brown (10YR 6/2) compact fibrous trona. |
| 37.5 | .5 | Hanksite. Well-consolidated massive hanksite and aggregates of hanksite crystals averaging 15 mm in length. |
| 37.6 | .1 | Trona, hanksite*, and halite*. White (N 9) soft massive trona with scattered disseminated hanksite crystals up to 5 mm in length; numerous inclusions, 1-2 mm long, of hard white (N 9) massive hanksite*. Trona 95 percent, hanksite 3 percent, halite 2 percent. |
| 38.3 | .7 | No core. |
| 38.5 | .2 | Halite. Unconsolidated aggregate of white (N 9) halite anhedra averaging 4 mm in length. |
| 40.3 | 1.8 | Hanksite and halite. Well-consolidated slightly vuggy granular massive hanksite and halite, with vugs containing euhedral hanksite crystals; 1 large hanksite crystal 10 cm in length. Hanksite 60 percent, halite 40 percent. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 43.9 | 3.6 | No core. |
| 44.1 | .2 | Halite. Well-consolidated aggregate of colorless to white (<i>N</i> 9) halite cubes from 2 to 5 mm in length. |
| 44.4 | .3 | Hanksite*, halite*, and trona*. Well-consolidated aggregate of pale yellowish-brown (10YR 6/2) intermixed granular massive hanksite*, halite*, and trona*. Hanksite 35 percent, halite 35 percent, trona 30 percent. |
| 44.9 | .5 | Hanksite and clay. Well-consolidated aggregate of hanksite crystals averaging 10 mm in length, with 25 percent interstitial black (<i>N</i> 1) clay. |
| 45.1 | .2 | Hanksite and halite. Well-consolidated aggregate of hanksite crystals averaging 2 cm in length, with 50 percent disseminated halite crystals averaging 2 mm in length. |
| 45.3 | .2 | Hanksite. Pale yellowish-brown (10YR 6/2) massive hanksite. |
| 45.4 | .1 | Hanksite, halite, and clay. Well-consolidated vuggy aggregate of hanksite crystals averaging 5 mm in length, with black to dark yellowish-orange (10YR 6/6) to dark-gray (<i>N</i> 3) clay seams containing disseminated halite crystals averaging 2 mm in length. Hanksite 80 percent, clay 10 percent, halite 10 percent. |
| 45.5 | .1 | Halite. Friable aggregate of colorless halite cubes averaging 2 mm in length. |
| 45.7 | .2 | Hanksite. Black (<i>N</i> 1) to olive-gray (5Y 4/1) massive hanksite, discolored by trace of intermixed clay. |
| 45.8 | .1 | Hanksite, halite, and clay. Black (<i>N</i> 1) to dark-gray (<i>N</i> 3) to dark yellowish-orange (10YR 6/6) clay with disseminated halite and hanksite crystals averaging 10 mm in length. Clay 50 percent, hanksite 40 percent, clay 10 percent. |
| 46.1 | .3 | Hanksite. Dense granular aggregate of hanksite crystals averaging 4 mm in length. |
| 46.7 | .6 | Hanksite. Well-consolidated vuggy aggregate of hanksite crystals averaging 10 mm in length. |
| 47.3 | .6 | Hanksite. Very dense granular aggregate of hanksite crystals from 3 to 4 mm in length. |
| 47.7 | .4 | Hanksite and halite. Well-consolidated slightly vuggy aggregate of 50 percent halite crystals from 1 to 2 mm in length and 50 percent granular massive hanksite. |
| 47.9 | .2 | Trona. White (<i>N</i> 9) to very light gray (<i>N</i> 8) soft massive trona. |
| 48.1 | .2 | No. core. |
| 48.3 | .2 | Halite. Unconsolidated aggregate of halite crystals averaging 2 mm in length. Probably cuttings, not core. |
| 48.4 | .1 | Trona and clay. Well-consolidated dark-gray (<i>N</i> 3) soft massive trona and black (<i>N</i> 1) clay. Trona 50 percent, clay 50 percent. |
| 48.7 | .3 | Trona and hanksite. Well-consolidated massive hanksite and trona. Hanksite 50 percent, trona 50 percent. |
| 48.9 | .2 | Trona and hanksite. Well-consolidated massive trona containing 50 percent disseminated hanksite crystals from 5 to 10 mm in length. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 49.1 | 0.2 | Hanksite and trona. Well-consolidated massive hanksite with pockets of soft massive trona. Hanksite 90 percent, trona 10 percent. |
| 49.3 | .2 | Halite and hanksite. Unconsolidated aggregate of halite crystals averaging 2 mm in length, containing 20 percent disseminated hanksite crystals averaging 10 mm in length. |
| 49.4 | .1 | Hanksite. Well-consolidated massive hanksite. |
| 49.5 | .1 | Clay. Well-consolidated black (N 1) clay and intermixed olive-gray (5Y 4/1) silt. |
| 49.6 | .1 | Halite and hanksite. Unconsolidated aggregate of halite crystals from 1 to 2 mm in length, containing 10 percent disseminated hanksite crystals averaging 10 mm in length. |
| 49.9 | .3 | Hanksite. Well-consolidated massive hanksite. |
| 50.2 | .3 | Halite and trona. Poorly consolidated aggregate of halite crystals from 1 to 2 mm in length, with fragments of white (N 9) to light-gray (N 7) massive trona. Halite 50 percent, trona 50 percent. |
| 50.4 | .2 | Trona. Well-consolidated white (N 9) to light-gray (N 7) massive trona. |
| 51.4 | 1.0 | No core. |
| 52.7 | 1.3 | Trona and hanksite. Well-consolidated white (N 9) massive trona with disseminated crystals of hanksite averaging 10 mm in length and seams averaging 5 mm wide of massive hanksite. Trona 80 percent, hanksite 20 percent. |
| 54.3 | 1.6 | No core. |
| 55.0 | .7 | Trona. White (N 9) to very light gray (N 8) soft massive trona. |
| 55.3 | .3 | Trona and hanksite. White (N 9) to very light gray (N 8) hard, bony trona with disseminated hanksite crystals averaging 10 mm in length. Trona 80 percent, hanksite 20 percent. |
| 56.1 | .8 | Clay and gaylussite.* Black (N 1) dense laminated clay with 50 percent disseminated gaylussite* crystals from 5 to 10 mm in length. |
| 56.6 | .5 | Clay and gaylussite. Black (N 1) to moderate yellowish-brown (10YR 5/4) to grayish yellow-green (5GY 7/2) to very light gray (N 8) to grayish olive-green (5GY 3/2) dense finely laminated clay with 5 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 57.1 | .5 | Clay and gaylussite. Black (N 1) to grayish olive-green (5GY 3/2) dense finely laminated clay with 50 percent disseminated gaylussite crystals from 5 to 10 mm in length. |
| 58.1 | 1.0 | Clay. Black (N 1) to dusky yellow-green (5GY 5/2) to moderate olive-brown (5Y 4/4) dense laminated clay. |
| 58.4 | .3 | Clay, aragonite, and gaylussite. Moderate olive-brown (5Y 4/4) to black (N 1) clay coarsely laminated with widely spaced seams, averaging 1 mm wide, of light-gray (N 7) to yellowish-gray (5Y 7/2) soft massive finely crystalline aragonite; seam of disseminated gaylussite crystals, 5 mm wide, at base. Clay 92 percent, aragonite 5 percent, gaylussite 3 percent. |
| 59.3 | .9 | No core. |

| Depth (feet) | Unit thickness (feet) | Description |
|-----------------|--------------------------|---|
| 59.7 | 0.4 | Clay. Black (N 1) to light olive-brown (5Y 5/6) to dusky-yellow (5Y 6/4) coarsely laminated clay with a few disseminated gaylussite crystals from 5 to 10 mm in length; seam of disseminated gaylussite silt at 59.5 ft. |
| 61.2 | 1.5 | Clay and gaylussite. Black (N 1) to grayish-orange (10YR 7/4) to very light gray (N 8) to dark-gray (N 3) dense finely laminated clay; scattered clusters and pods of disseminated gaylussite crystals. Clay 98 percent, gaylussite 2 percent. |
| 61.3 | .1 | Clay and gaylussite*. Black (N 1) clay with 50 percent disseminated gaylussite* crystals averaging 5 mm in length. |
| 62.6 | 1.3 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) finely laminated clay with pockets of disseminated gaylussite crystals averaging 5 mm in length. Clay 95 percent, gaylussite 5 percent. |
| 63.1 | .5 | Clay. Black (N 1) to pale yellowish-orange (10YR 8/6) to very light gray (N 8) dense coarsely laminated clay. |
| 63.2 | .1 | Clay and gaylussite. Light olive-gray (5Y 5/2) to pale-olive (10Y 6/2) to black (N 1) clay with seams of disseminated gaylussite crystals. Clay 40 percent, gaylussite 60 percent. |
| 63.6 | .4 | No core. |
| 64.8 | 1.2 | Clay and gaylussite. Black (N 1) to dusky-yellow (5Y 6/4) to yellowish-gray (5Y 7/2) to dark yellowish-orange (10YR 6/6) to grayish yellow-green (5GY 7/2) dense finely laminated clay; pockets and streaks of disseminated gaylussite crystals averaging 5 mm in length. Clay 80 percent, gaylussite 20 percent. |
| 65.8 | 1.0 | Clay and gaylussite. Black (N 1) to light-olive (10Y 5/4) to moderate-yellow (5Y 7/6) to grayish-olive (10Y 4/2) dense clay with 30 percent disseminated gaylussite crystals from 1 to 3 mm in length. |
| 66.2 | .4 | Clay. Black (N 1) dense clay. |
| 66.8 | .6 | Clay. Black (N 1) to light-olive (10Y 5/4) to moderate-yellow (5Y 7/6) to grayish-olive (10Y 4/2) dense clay with indistinct layers discolored moderate reddish-orange (10R 6/6) by algae(?). |
| 67.5 | .7 | No core. |
| 67.8 | .3 | Clay and pirssonite*. Black (N 1) dense clay with seams of disseminated euhedral colorless pirssonite* crystals from 1 to 2 mm in length. Clay 80 percent, pirssonite 20 percent. |
| 68.1 | .3 | Clay and northupite*. Black (N 1) to greenish-black (5GY 2/1) to grayish olive-green (5GY 3/2) to dark yellowish-orange (10YR 6/6) dense clay; seam at base, 5 mm wide, of disseminated northupite* octahedra averaging 1 mm in length. Clay 98 percent, northupite 2 percent. |
| 68.3 | .2 | Clay and pirssonite. Black (N 1) dense clay with 30 percent disseminated pirssonite crystals averaging 1 mm in length. |
| 68.5 | .2 | Trona and borax. Aggregate of trona blades averaging 5 mm in length, with disseminated borax crystals averaging 10 mm in length. Borax 80 percent, trona 20 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 69. 1 | 0. 6 | Trona and clay. Well-consolidated white (<i>N</i> 9) to light olive-gray (5Y 6/1) bladed and massive trona; black (<i>N</i> 1) clay seam from 68.7 to 68.8 ft. Trona 85 percent, clay 15 percent. |
| 71. 0 | 1. 9 | Clay and pirssonite. Black (<i>N</i> 1) dense clay with 40 percent disseminated pirssonite crystals from 1 to 3 mm in length. |
| 72. 3 | 1. 3 | Trona. Well-consolidated compact fibrous trona, discolored white (<i>N</i> 9) to dark-gray (<i>N</i> 3) by intermixed clay. Trona 98 percent, clay 2 percent. |
| 73. 2 | . 9 | Halite, trona, and clay. Well-consolidated slightly vuggy aggregate of halite cubes averaging 5 mm in length, with fine fibrous trona in pockets; discolored by intermixed black (<i>N</i> 1) clay; moderate reddish-orange (10R 6/6) algae(?) discolored clay at 72.7 to 72.9 ft with algal(?) inclusions in halite crystals. Halite 80 percent, trona 15 percent, clay 5 percent. |
| 73. 9 | . 7 | Trona and clay. White (<i>N</i> 9) to dark-gray (<i>N</i> 3) fine fibrous trona at top grading to hard massive trona at base; discolored by 10 percent intermixed clay. |
| 74. 2 | . 3 | Clay. Black (<i>N</i> 1) dense clay. |
| 74. 4 | . 2 | Clay and pirssonite. Black (<i>N</i> 1) to olive-black (5Y 2/1) clay with seams and pockets of disseminated pirssonite crystals averaging 5 mm in length. Clay 80 percent, pirssonite 20 percent. |
| 75. 3 | . 9 | No core. |
| 76. 7 | 1. 4 | Clay and pirssonite. Black (<i>N</i> 1) dense clay with 40 percent pirssonite crystals averaging 5 mm in length in seams 1 to 2 mm wide and disseminated throughout the clay. |
| 77. 1 | . 4 | Clay and pirssonite. Black (<i>N</i> 1) clay with 35 percent disseminated pirssonite sand. |
| 77. 3 | . 2 | Borax and clay. Black (<i>N</i> 1) clay with 80 percent disseminated euhedral borax crystals from 5 to 10 mm in length. |
| 77. 4 | . 1 | Trona. Poorly consolidated dark-gray (<i>N</i> 3), fine fibrous trona. |
| 78. 0 | . 6 | No core. |
| 78. 4 | . 4 | Trona. Well-consolidated white (<i>N</i> 9) to dark-gray (<i>N</i> 3) massive trona. |
| 79. 4 | 1. 0 | Halite, trona, and clay. Unconsolidated aggregate of halite cubes averaging 5 mm in length, massive trona fragments, and black (<i>N</i> 1) clay. Halite 80 percent, trona 15 percent, clay 5 percent. |
| 79. 6 | . 2 | Halite and trona. Well-consolidated colorless to white (<i>N</i> 9) halite crystals averaging 5 mm in length, with thin seam of soft massive trona at top. Halite 95 percent, trona 5 percent. |
| 79. 8 | . 2 | Trona. Well-consolidated white (<i>N</i> 9) to medium dark-gray (<i>N</i> 4) massive trona. |
| 80. 8 | 1. 0 | No core. |
| 81. 2 | . 4 | Trona. Medium-gray (<i>N</i> 5) soft massive trona. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 81.5 | 0.3 | Halite. Poorly consolidated aggregate of white (N 9) to colorless halite cubes averaging 3 mm in length. |
| 82.2 | .7 | Halite and trona. Well-consolidated aggregate of halite crystals averaging 3 mm in length and medium-gray (N 5) soft massive trona. Halite 50 percent, trona 50 percent. |
| 82.4 | .2 | Halite. Well-consolidated colorless to white (N 9) halite crystals averaging 3 mm in length. |
| 82.5 | .1 | No core. |
| 82.9 | .4 | Trona. Well-consolidated medium-gray (N 5) soft massive trona. |
| 83.8 | .9 | Halite. Well-consolidated colorless to white (N 9) halite cubes from 5 to 10 mm in length. |
| 84.1 | .3 | Trona. Well-consolidated grayish-yellow (5Y 8/4) hard massive trona. |
| 84.4 | .3 | Halite. Well-consolidated white to colorless halite cubes 2 to 5 mm in length. |
| 84.6 | .2 | Trona, halite and hanksite*. Grayish-yellow (5Y 8/4) hard slightly vuggy massive trona with colorless halite and hanksite* crystals, averaging 5 mm in length, in vugs. Trona 94 percent, halite 5 percent, hanksite 1 percent. |
| 84.9 | .3 | Halite. Well-consolidated white (N 9) to colorless halite cubes averaging 3 mm in length. |
| 85.0 | .1 | Trona and halite. Poorly consolidated white (N 9) to dark-gray (N 3) soft massive trona with disseminated halite crystals averaging 5 mm in length. Trona 50 percent, halite 50 percent. |
| 85.3 | .3 | Halite. Well-consolidated aggregate of pale-pink (5RP 8/2) halite crystals averaging 3 mm in length. |
| 85.4 | .1 | Trona. Poorly consolidated dark-gray (N 3) soft massive trona. |
| 85.7 | .3 | Halite. Poorly consolidated aggregate of white (N 9) to colorless halite cubes, averaging 5 mm in length, discolored by trace of interstitial clay. |
| 86.1 | .4 | Trona. Well-consolidated dark greenish-gray (5GY 4/1) soft massive trona. |
| 86.3 | .2 | Halite. Well-consolidated aggregate of white (N 9) halite cubes averaging 3 mm in length. |
| 86.6 | .3 | Burkeite* and halite. Grayish-yellow (5Y 8/4) to dark greenish-gray (5GY 6/1) soft massive burkeite* with disseminated halite crystals 5 to 10 mm in length; burkeite locally discolored moderate reddish-orange (10R 6/6) by algae(?). Burkeite 80 percent, halite 20 percent. |
| 86.8 | .2 | Halite. Poorly consolidated aggregate of white (N 9) to colorless halite cubes averaging 5 mm in length. |
| 87.2 | .4 | Trona. Well-consolidated dark greenish-gray (5GY 4/1) soft massive trona. |
| 87.9 | .7 | Halite. Well-consolidated aggregate of white (N 9) to colorless halite crystals, averaging 5 mm in length, discolored dark-gray (N 3) by trace of interstitial clay; trace of trona. |
| 88.0 | .1 | Clay and trona. Black (N 1) clay seam with disseminated trona blades 5 to 10 mm in length. Clay 80 percent, trona 20 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 88.3 | 0.3 | Trona. Well-consolidated dark greenish-gray (5GY 4/1) to white (N 9) hard slightly vuggy massive trona with grayish-orange (10YR 8/6) fibrous trona in vugs. |
| 88.7 | .4 | Trona. Pale yellowish-orange (10YR 8/6) to white (N 9) hard dense massive trona. |
| 89.1 | .4 | Halite, hanksite, and trona. Well-consolidated aggregate of colorless to white (N 9) halite crystals averaging 5 mm in length, with large pocket of intermixed euhedral hanksite crystals with prominent basal pinacoid and grayish-orange (10YR 7/4) fibrous trona. Halite 90 percent, hanksite 5 percent, trona 5 percent. |
| 89.4 | .3 | Clay. Black (N 1) to grayish yellow-green (5GY 7/2) to light-gray (N 7) dense finely laminated clay; several laminae discolored light red (5R 6/6) by algae(?). |
| 89.5 | .1 | Borax and trona. Seam of euhedral borax crystals, averaging 10 mm in length, at top with seam of fibrous trona at base. Borax 50 percent, trona 50 percent. |
| 89.7 | .2 | Trona. Fractured core. Fragments of white (N 9) to grayish-orange (10YR 7/4) soft massive trona. |
| 90.3 | .6 | Burkeite and hanksite. Grayish-orange (10YR 7/4) moderately vuggy hard dense massive burkeite; euhedral hanksite crystals with prominent basal pinacoid, averaging 5 mm in length, in lenticular horizontal vugs. Burkeite 95 percent, hanksite 5 percent. |
| 90.6 | .3 | Trona. Poorly consolidated. Greenish-gray (5GY 6/1) to white (N 9) soft trona. |
| 90.8 | .2 | Trona. Well-consolidated white (N 9) to dark-gray (N 3) hard massive trona, discolored locally moderate reddish-orange (10R 6/6) by algae(?). |
| 91.3 | .5 | Clay, borax, and northupite. Black (N 1) to grayish-black (N 2) to light-gray (N 7) to moderate olive-brown (5Y 4/4) to grayish-olive (10Y 4/2) dense finely laminated clay; disseminated borax crystals up to 25 mm in length; circular to oval nodules, averaging 1 mm in diameter, of white (N 9) massive northupite* with minor gaylussite* in layer 10 mm wide at 91.0 ft. Clay 95 percent, borax 5 percent. |
| 91.6 | .3 | Clay and gaylussite. Black (N 1) to light-olive (10Y 5/4) to moderate olive-brown (5Y 4/4) dense finely laminated clay with disseminated gaylussite crystals from less than 1 to 6 mm in length, averaging 2 mm; a few laminae of moderate yellowish-brown (10YR 5/4) silt. Clay 60 percent, gaylussite 40 percent. |
| 92.3 | .7 | Clay. Black (N 1) to pale-olive (10Y 6/2) to grayish-olive (10Y 4/2) dense finely laminated clay; scattered silty layers 1 to 5 mm thick; 6 distinct laminae, 1 mm wide, discolored moderate reddish orange (10R 6/6) by algae(?) from 91.8 to 92.0 ft. |
| 93.3 | 1.0 | Trona. Well-consolidated white (N 9) to greenish-gray (5GY 6/1) hard massive trona with pockets of pale yellowish-orange (10YR 8/6) to white (N 9) fibrous trona. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 93.7 | 0.4 | Clay. Black (<i>N</i> 1) to moderate olive-brown (5Y 4/4) dense finely laminated clay. |
| 93.8 | .1 | Clay and gaylussite. Black (<i>N</i> 1) to moderate olive-brown (5Y 4/4) dense finely laminated clay with 40 percent disseminated gaylussite crystals averaging 1 mm in length. |
| 94.1 | .3 | Clay. Black (<i>N</i> 1) to moderate olive-brown (5Y 4/4) dense finely laminated clay. |
| 94.3 | .2 | Trona and borax. Coarse aggregate of pale yellowish-orange (10YR 8/6) to white (<i>N</i> 9) fibrous and bladed trona with disseminated borax crystals averaging 5 mm in length. Trona 80 percent, borax 20 percent. |
| 95.3 | 1.0 | No core. |
| 96.3 | 1.0 | Trona. Coarse vuggy aggregate of fibrous and bladed trona with layers and pods of pale yellowish-orange (10YR 8/6) to white (<i>N</i> 9) to medium-gray (<i>N</i> 5) massive trona; trace of medium dark-gray (<i>N</i> 4) clay. |
| 97.1 | .8 | Clay. Grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) dense finely laminated clay with a few thin seams of gaylussite silt. |
| 97.7 | .6 | Clay and gaylussite. Black (<i>N</i> 1) to light-brown (5YR 5/6) clay with 40 percent disseminated gaylussite crystals from less than 1 to 15 mm in length. |
| 98.3 | .6 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) to light olive-brown (5Y 5/6) dense finely laminated clay; scattered seams of disseminated gaylussite silt. |
| 98.7 | .4 | Trona and clay. Well-consolidated white (<i>N</i> 9) to light olive-gray (5Y 6/1) trona with intermixed black (<i>N</i> 1) clay. Trona 80 percent, clay 20 percent. |
| 99.3 | .6 | Clay and gaylussite. Well-consolidated black (<i>N</i> 1) to light-brown (5YR 5/6) to light olive-brown (5Y 5/6) clay with 35 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 100.2 | .9 | No core. |
| 100.8 | .6 | Clay and gaylussite. Light-brown (5YR 5/6) to pale-olive (10Y 6/2) to grayish-green (10GY 5/2) dense finely laminated clay with 30 percent disseminated gaylussite crystals up to 35 mm in length, averaging 20 mm. |
| 101.4 | .6 | Clay. Black (<i>N</i> 1) to medium dark-gray (<i>N</i> 4) to dusky-yellow (5Y 6/4) to pale-olive (10Y 6/2) dense finely laminated clay. |
| 101.5 | .1 | Clay and gaylussite. Black (<i>N</i> 1) to medium dark-gray (<i>N</i> 4) to dusky-yellow (5Y 6/4) to pale-olive (10Y 6/2) dense finely laminated clay with 40 percent disseminated gaylussite crystals from 5 to 10 mm in length. |
| 101.8 | .3 | Clay. Same as in unit 100.8 to 101.4 ft. |
| 101.9 | .1 | Clay and gaylussite. Same as in unit 101.4 to 101.5 ft but with 30 percent disseminated gaylussite crystals from 3 to 5 mm in length. |
| 103.7 | 1.8 | Clay and gaylussite. Same as in unit 101.4 to 101.5 ft but with 10 percent disseminated gaylussite crystals from 5 to 10 mm in length. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 104.5 | 0.8 | Clay. Dark yellowish-orange (10YR 6/6) to grayish-black (N 2) to greenish-gray (5GY 6/1) to very light gray (N 8) dense finely laminated clay. |
| 104.6 | .1 | Clay and gaylussite. Clay as in unit 103.7 to 104.5 ft but with 50 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 105.1 | .5 | Clay. Same as in unit 103.7 to 104.5 ft. |
| 105.3 | .2 | Clay and gaylussite. Clay as in unit 103.7 to 104.5 ft but with 50 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 107.3 | 2.0 | Clay. Same clay as in unit 103.7 to 104.5 ft. |

Searles drill hole GS-4

LOCATION: Searles Lake, Calif., sec.: 17, T. 26 S., R., 44 E., Mount Diablo base and meridian, approx. 1,788 ft S. 88° W. of ¼ sec. marker for secs. 8 and 17.

ELEVATION AT TOP OF HOLE: 1,619 ft (approx.).

ELEVATION AT BOTTOM OF HOLE: 1,522.8 ft.

TOTAL DEPTH: 96.2 ft.

DATE OF DRILLING: Sept. 10-21, 1954.

CASING USED: 24.0 ft of 16-in casing from surface; hole refilled with sand from bottom to 63.3 ft and cemented from 63.3 to 50.5 ft.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*); minerals identified by X-ray diffraction methods are denoted by two asterisks (**).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 22.5 | 22.5 | Overburden mud; not cored. Brown to black (N 1) soft moist clay. |
| 23.7 | 1.2 | Clay. Black (N 1) to dusky-yellow (5Y 6/4) clay with a few disseminated crystals of pirssonite* and halite. |
| 24.1 | .4 | Clay and halite. Black (N 1) clay with 50 percent subhedral to anhedral halite crystals averaging 10 mm in length, loosely disseminated throughout. |
| 24.3 | .2 | Halite. Well-consolidated aggregate of halite cubes averaging 3 mm in length; discolored dusky yellow (5GY 5/2) to medium gray (N 5) by trace of interstitial clay. |
| 24.8 | .5 | Clay and halite. Black (N 1) clay with seam, 15 mm wide, of halite cubes averaging 2 mm in length, at 24.5 ft. Clay 90 percent, halite 10 percent. |
| 25.0 | .2 | Halite. Well-consolidated slightly vuggy aggregate of halite cubes and cubes modified by octahedron, averaging 4 mm in length; discolored medium gray (N 5) by trace of interstitial clay. |
| 25.2 | .2 | Halite and trona. Well-consolidated very vuggy aggregate of halite cubes and cubes modified by octahedron, averaging 10 mm in length, with 10 percent interstitial fibrous trona. |
| 25.4 | .2 | Trona and clay. Compact fibrous trona discolored pale olive (10Y 6/2) to grayish yellow (5Y 8/4) to grayish black (N 2) by 10 percent interstitial black (N 1) to grayish-black (N 2) clay. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 25.8 | 0.4 | Halite. Well-consolidated slightly vuggy dense aggregate of halite cubes averaging 3 mm in length; discolored greenish gray (5GY 6/1) to medium dark gray (N 4) by trace of interstitial clay. |
| 26.0 | .2 | Trona and clay. Well-consolidated compact fibrous trona discolored grayish yellow (5Y 8/4) to grayish black (N 2) by 5 percent interstitial clay. |
| 26.6 | .6 | Halite and clay. Well-consolidated slightly vuggy aggregate of halite cubes averaging 3 mm in length, with thin black (N 1) clay streaks. Halite 90 percent, clay 10 percent. |
| 26.7 | .1 | Clay. Black (N 1) dense clay. |
| 27.7 | 1.0 | Halite and clay. Friable vuggy aggregate of halite cubes up to 25 mm in diameter, averaging 5 mm, with 10 percent interstitial black (N 1) clay. |
| 27.9 | .2 | Halite and clay. Slightly vuggy massive halite with pockets of grayish-yellow (5Y 8/4) fibrous trona; halite discolored medium light gray (N 6) by trace of interstitial clay; clay seam 15 mm wide, with trace of trona at base. Halite 75 percent, clay 25 percent. |
| 28.7 | .8 | Halite, trona, and clay. Well-consolidated aggregate of halite cubes, averaging 10 mm in length, intermixed with 10 percent fibrous trona and 10 percent black (N 1) clay. |
| 28.8 | .1 | Trona and halite. Grayish-green (10GY 5/2) massive trona with 30 percent disseminated halite cubes and anhedral averaging 3 mm in length. |
| 29.0 | .2 | Halite. Well-consolidated vuggy aggregate of halite cubes averaging 3 mm in length; locally discolored by trace of interstitial black (N 1) clay. |
| 30.5 | 1.5 | No core. |
| 31.1 | .6 | Halite. Well-consolidated aggregate of white (N 9) to medium-gray (N 5) halite cubes and cubes modified by octahedron, averaging 3 mm in length; discolored by trace of interstitial clay. |
| 32.6 | 1.5 | Halite and burkeite*. Well-consolidated vuggy aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, with thin streaks and pockets of white (N 9) to very pale orange (10YR 8/2) massive burkeite*. Halite 80 percent, burkeite 20 percent. |
| 33.2 | .6 | Trona and halite. Well-consolidated vuggy white (N 9) to light greenish-gray (5GY 8/1) massive trona, with disseminated halite crystals averaging 5 mm in length; lenticular vugs contain halite crystals. Trona 65 percent, halite 35 percent. |
| 33.8 | .6 | Halite. Well-consolidated slightly vuggy aggregate of white (N 9) to greenish-gray (5GY 6/1) to colorless halite cubes averaging 3 mm in length. |
| 34.0 | .2 | Halite* and clay. White (N 9) to light-gray (N 7) dense massive halite* with streak of black (N 1) clay, 5 mm wide, at base. Halite 90 percent, clay 10 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|-----------------------------|--|
| 34. 6 | 0. 6 | Halite, trona, and clay. Well-consolidated slightly vuggy aggregate of white (N 9) to colorless halite cubes and massive halite alternating with layers of white (N 9) to greenish-gray (5GY 6/1) massive trona; vugs contain fibrous trona and halite crystals averaging 5 mm in diameter; scattered thin streaks and lenticular pockets of black (N 1) to grayish-black (N 2) clay. Halite 50 percent, trona 45 percent, clay 5 percent. |
| 34. 8 | . 2 | No core. |
| 36. 6 | 1. 8 | Trona, halite, and hanksite. Well-consolidated white (N 9) to greenish-gray (5GY 6/1) massive trona, with disseminated crystals and thin streaks and pockets of halite cubes modified by octahedron, averaging 5 mm in length; pockets of euhedral hanksite crystals averaging 10 mm in length in lower 0.5 ft. Trona 55 percent, halite 40 percent, hanksite 5 percent. |
| 36. 9 | . 3 | Hanksite, trona, and clay. Dense aggregate of euhedral hanksite crystals averaging 10 mm in length, with thin streaks and pockets of very light gray (N 2) soft massive trona; seam of black (N 1) clay, 5 mm wide, at base. Hanksite 70 percent, trona 25 percent, clay 5 percent. |
| 37. 7 | . 8 | Halite. Friable aggregate of white (N 9) to light-gray (N 7) halite cubes and anhedral averaging 3 mm in length. |
| 38. 0 | . 3 | Halite and trona. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 5 mm, with 15 percent interstitial fibrous trona. |
| 38. 2 | . 2 | Hanksite and trona. Vuggy aggregate of euhedral hanksite crystals averaging 10 mm in length, with 15 percent interstitial dark greenish-gray (5GY 4/1) to greenish-gray (5GY 6/1) soft massive trona. |
| 38. 4 | . 2 | Halite. Well-consolidated aggregate of white (N 9) to colorless to dark-gray (N 3) halite cubes averaging 3 mm in length. |
| 39. 4 | 1. 0 | No core. |
| 39. 9 | . 5 | Halite*, trona*, hanksite, and clay. Light brownish-gray (5YR 6/1) to white (N 9) dense massive intermixed halite* and trona* with vuggy seams, 5 mm wide, of black (N 1) to grayish-black (N 2) clay, halite cubes averaging 3 mm in length and euhedral hanksite crystals averaging 5 mm. Halite 80 percent, trona 10 percent, hanksite 5 percent, clay 5 percent. |
| 40. 6 | . 7 | Halite. Well-consolidated dense aggregate of white (N 9) to colorless halite cubes averaging 3 mm in length. |
| 41. 0 | . 4 | Halite and trona. Vuggy aggregate of halite cubes averaging 3 mm in length, with fibrous trona in pockets and lining vugs. Halite 70 percent, trona 30 percent. |
| 41. 4 | . 4 | Hanksite, trona, and clay. Well-consolidated massive hanksite alternating with vuggy seams, 3 mm wide, of fibrous trona, black (N 1) to grayish-black (N 2) clay, and hanksite crystals averaging 3 mm in length. Hanksite 60 percent, trona 35 percent, clay 5 percent. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 41.7 | 0.3 | Trona and hanksite. Well-consolidated dense white (N 9) fibrous trona with disseminated hanksite crystals averaging 5 mm in length. Trona 60 percent, hanksite 40 percent. |
| 42.1 | .4 | Trona, hanksite, and clay. Well-consolidated white (N 9) to olive-gray (5Y 4/1) dense massive trona containing disseminated euhedral hanksite crystals averaging 5 mm in length; with vuggy layers of fibrous trona, black (N 1) clay, and hanksite crystals averaging 5 mm in length. Trona 70 percent, hanksite 25 percent, clay 5 percent. |
| 42.2 | .1 | Trona. Light-gray (N 7) to greenish-gray (5GY 6/1) soft porous massive trona. |
| 45.2 | 3.0 | No core. |
| 46.2 | 1.0 | Trona. White (N 9) soft porous massive trona. |
| 47.7 | 1.5 | No core. |
| 49.0 | 1.3 | Trona. White (N 9) soft porous massive trona. |
| 49.1 | .1 | Trona. White (N 9) to yellowish-gray (5Y 7/2) dense hard bony massive trona. |
| 49.8 | .7 | No core. |
| 49.9 | .1 | Clay and pirssonite. Dusky-yellow (5Y 6/4) to grayish-olive (10Y 4/2) to grayish-black (N 2) dense finely laminated clay, with 20 percent disseminated pirssonite crystals averaging 15 mm in length. |
| 50.1 | .2 | Clay and pirssonite. Dark greenish-gray (5G 4/1) to grayish-black (N 2) to black (N 1) dense faintly laminated clay with layer, 5 mm wide, of pirssonite crystals at 50.0 ft. Clay 90 percent, pirssonite 10 percent. |
| 51.2 | 1.1 | Clay and pirssonite. Black (N 1) to greenish-black (5G 2/1) dense finely laminated clay with 45 percent pirssonite crystals, averaging 20 mm in length, disseminated in layers. |
| 52.4 | 1.2 | Clay and pirssonite. Black (N 1) to grayish-olive (10YR 4/2) to grayish-green (5G 5/2) to grayish yellow-green (5GY 7/2) dense finely laminated clay with scattered pockets of pirssonite crystals, averaging 15 mm in length, in lower 0.5 ft. Clay 95 percent, pirssonite 5 percent. |
| 53.8 | 1.4 | Clay and aragonite. Black (N 1) dense clay, coarsely laminated with widely spaced seams, averaging 1 mm, of light greenish-gray (5GY 8/1) to greenish-gray (5GY 6/1) to very light gray (N 8) soft massive finely crystalline aragonite; laminae contorted in lower 0.6 ft. Clay 95 percent, aragonite 5 percent. |
| 54.4 | .6 | Clay and gaylussite. Black (N 1) to very light gray (N 8) to grayish-olive (10Y 4/2) to dusky-yellow (5Y 6/4) dense finely laminated clay with 25 percent gaylussite crystals, averaging 10 mm in length, forming layers of disseminated crystals. |
| 55.4 | 1.0 | Clay and gaylussite. Black (N 1) to very light gray (N 8) to grayish-olive (10Y 4/2) to dusky-yellow (5Y 6/4) to dark yellowish-orange (10Y R6/6) dense coarsely laminated clay with scattered pockets of gaylussite crystals averaging 10 mm in length. Clay 90 percent, gaylussite 10 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 56.9 | 1.5 | Clay and gaylussite. Black (<i>N</i> 1) to very light gray (<i>N</i> 8) to grayish-olive (10Y 4/2) to dusky-yellow (5Y 6/4) to dark yellowish-orange (10YR 6/6) dense finely laminated clay with scattered pockets of 5 percent gaylussite crystals averaging 5 mm in length. |
| 57.2 | .3 | Clay and gaylussite. Black (<i>N</i> 1) to very light gray (<i>N</i> 8) to grayish-olive (10Y 4/2) to dusky-yellow (5Y 6/4) dense finely laminated clay with 20 percent gaylussite crystals averaging 10 mm in length, disseminated in layers. |
| 57.8 | .6 | Clay, aragonite, and gaylussite. Black (<i>N</i> 1) dense clay, coarsely laminated with widely spaced laminae of very light gray (<i>N</i> 8) to grayish-olive (10Y 4/2) to dusky-yellow (5Y 6/4) soft massive aragonite; layer, 10 mm wide, of disseminated gaylussite crystals, averaging 5 mm in length, at 57.5 ft. Clay 90 percent, aragonite 5 percent, gaylussite 5 percent. |
| 58.3 | .5 | No core. |
| 58.5 | .2 | Clay. Black (<i>N</i> 1) to greenish-black (5GY 2/1 and 5G 2/1) to dusky yellow-green (5GY 5/2) to grayish-olive (10Y 4/2) to dark yellowish-orange (10YR 6/6) dense faintly coarsely laminated clay. |
| 58.8 | .3 | Clay and aragonite**. Black (<i>N</i> 1) to greenish-black (5GY 2/1) dense clay, coarsely laminated with widely spaced seams, averaging 1 mm, of very light gray (<i>N</i> 8) soft massive aragonite**. Clay 95 percent, aragonite 5 percent. |
| 62.3 | 3.5 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) to grayish olive-green (5GY 3/2) to grayish-green (5G 5/2) clay with laminae, averaging 10 mm thick, shown by color differences; scattered pockets of disseminated gaylussite crystals averaging 5 mm in length. Clay 95 percent, gaylussite 5 percent. |
| 63.0 | .7 | No core. |
| 63.2 | .2 | Clay and gaylussite. Black (<i>N</i> 1) dense clay with 50 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 63.5 | .3 | Clay and gaylussite* sand. Black (<i>N</i> 1) dense clay with 50 percent disseminated gaylussite* crystals 1 mm or less in length. |
| 63.7 | .2 | Clay. Black (<i>N</i> 1) to dark greenish-gray (5G 4/1) to grayish olive-green (5GY 3/2) dense clay. |
| 63.8 | .1 | Clay and gaylussite. Black (<i>N</i> 1) clay with 50 percent disseminated gaylussite crystals averaging 1 mm or less in length. |
| 64.0 | .2 | Clay. Black (<i>N</i> 1) dense clay. |
| 64.4 | .4 | Clay and gaylussite. Black (<i>N</i> 1) to dusky-yellow (5Y 6/4) to dark greenish-gray (5G 4/1) dense clay with 40 percent disseminated gaylussite crystals averaging 2 mm in length. |
| 64.6 | .2 | Clay. Black (<i>N</i> 1) dense clay. |
| 65.5 | .9 | Trona and clay. Light-gray (<i>N</i> 7) to white (<i>N</i> 9) dense massive trona with streaks and pockets of dark-gray (<i>N</i> 3) clay; in lower 0.3 ft, fibrous trona in vugs with a few trona blades 5 mm long. Trona 95 percent, clay 5 percent. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 65.9 | 0.4 | Clay. Black (N 1) to light-gray (N 7) dense faintly laminated clay. |
| 67.1 | 1.2 | Clay and gaylussite*. Black (N 1) to grayish-black (N 2) clay with 50 percent disseminated crystals of gaylussite* averaging 2 mm in length. |
| 67.3 | .2 | No core. |
| 69.4 | 2.1 | Clay and gaylussite. Black (N 1) to dark greenish-gray (5G 4/1) dense clay with 50 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 70.0 | .6 | Clay. Black (N 1) dense clay. |
| 71.0 | 1.0 | Trona. White (N 9) to dark-gray (N 3) dense massive trona, discolored by trace of clay. |
| 71.8 | .8 | No core. |
| 74.5 | 2.7 | Clay and gaylussite. Black (N 1) clay with 45 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 75.6 | 1.1 | Clay. Black (N 1) dense clay. |
| 76.3 | .7 | No core. |
| 77.6 | 1.3 | Trona. Dense aggregate of white (N 9) to colorless bladed and fibrous trona, discolored dark gray (N 3) by trace of interstitial clay. |
| 78.8 | 1.2 | Trona and northupite*. White (N 9) dense massive and fibrous trona, locally discolored dark gray (N 3) by trace of clay; layer, 10 mm wide, of yellowish-gray (5Y 7/2) massive northupite* with intermixed minor trona* at base. Trona 97 percent, northupite 3 percent. |
| 79.2 | .4 | Clay. Black (N 1) dense clay with faint closely spaced very light gray (N 8) laminae; pale yellowish-orange (10YR 8/6) silty layers at base less than 1 mm wide; distinct lamina, 1 mm wide, of moderate reddish-orange (10R 6/6) algae(?) at 79.0 ft. |
| 79.9 | .7 | Trona. White (N 9) to very pale orange (10YR 8/2) massive and fibrous trona, discolored dark gray (N 3) by trace of intermixed clay in upper 0.1 ft. |
| 80.8 | .9 | No core. |
| 81.6 | .8 | Trona and clay. White (N 9) to dark-gray (N 3) dense massive trona with grayish-black (N 2) clay streaks 2 mm wide; irregular wavy seams, about 2 mm wide at 81.2 and 81.5 ft of moderate reddish-orange (10R 6/6) algae(?); layer of densely packed trona* blades 10 mm wide at base. Trona 95 percent, clay 5 percent. |
| 82.2 | .6 | Clay and northupite. Black (N 1) dense finely laminated clay with layers of discrete circular to oval nodules, averaging 1 mm in length, of white (N 9) massive northupite from 81.7 to 82.0 ft. Clay 95 percent, northupite 5 percent. |
| 82.6 | .4 | Clay and gaylussite. Greenish-black (5GY 2/1) to moderate yellowish-brown (10YR 5/4) to grayish olive-green (5GY 3/2) clay with 40 percent disseminated gaylussite crystals averaging 2 mm in length. |
| 83.1 | .5 | Clay. Black (N 1) dense clay. |
| 83.9 | .8 | Trona and clay. Coarse white (N 9) to colorless bladed trona, blades averaging 20 mm in length; with 10 percent black (N 1) clay in thin interstitial streaks. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 84.2 | 0.3 | Clay and tychite*. Black (N 1) to greenish-black (5GY 2/1) dense clay with 20 percent disseminated colorless octahedra of tychite* averaging 1 mm in diameter. |
| 84.5 | .3 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) dense clay with 50 percent disseminated gaylussite crystals averaging 2 mm in length; a few thin layers of gaylussite sand. |
| 85.0 | .5 | Clay. Black (N 1) dense finely laminated clay with contorted laminae. |
| 86.0 | 1.0 | No core. |
| 86.3 | .3 | Trona. Medium light-gray (N 6) to dark-gray compact (N 3) fibrous trona discolored by trace of interstitial clay. |
| 87.2 | .9 | Clay. Black (N 1) to greenish-black (5GY 2/1) to grayish-yellow (5Y 8/4) to white dense finely laminated (N 9) clay. |
| 87.9 | .7 | Clay and gaylussite. Black (N 1) to olive-gray (5Y 3/2) to greenish-black (5GY 2/1) clay with 50 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 88.2 | .3 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) dense clay with 50 percent disseminated gaylussite sand. |
| 88.5 | .3 | Clay. Black (N 1) to grayish-black (N 2) to very light gray (N 8) dense finely laminated clay. |
| 88.9 | .4 | Clay and gaylussite. Black (N 1) to olive-black (5Y 2/1) to olive-gray (5Y 3/2) dense clay with 20 percent disseminated gaylussite sand. |
| 89.0 | .1 | Trona and clay. Dense massive trona with black (N 1) clay streaks. Trona 90 percent, clay 10 percent. |
| 89.5 | .5 | Clay. Grayish-black (N 2) to dark greenish-gray (5GY 4/1) to medium dark-gray (N 6) to olive-gray (5Y 3/2) dense finely laminated clay. |
| 89.7 | .2 | Clay and gaylussite. Dense finely laminated clay with colors as in unit 89.0 to 89.5 ft; with 10 percent disseminated gaylussite crystals, averaging 1 mm in length, in layers 2 to 3 mm wide. |
| 90.3 | .6 | Gaylussite and clay. Olive-black (5Y 2/1) to olive-gray (5Y 3/2) dense clay with 60 percent disseminated gaylussite crystals, averaging 25 mm in length, oriented in horizontal layers; fine closely spaced dark yellowish-orange (10YR 6/6) to pale yellowish-orange (10YR 8/6, clay laminae in lower 0.1 ft. |
| 90.6 | .3 | Clay. Medium dark-gray (N 4) to light-gray (N 7) dense finely laminated clay. |
| 90.9 | .3 | Clay and gaylussite. Olive-gray (5Y 3/2) to grayish-black (N 2) to moderate yellowish-brown (10YR 5/4) to grayish-olive (10Y 4/2) dense finely laminated clay with 20 percent disseminated gaylussite crystals averaging 15 mm in length. |
| 91.2 | .3 | No core. |
| 95.9 | 4.7 | Clay. Black (N 1) to grayish-black (N 2) to olive-black (5Y 2/1) to grayish-yellow (5Y 8/4) to yellowish-gray (5Y 7/2) to white (N 9) to light-brown (5R 5/6) dense finely laminated clay. |
| 96.2 | .3 | No core. |

Searles drill hole GS-7

LOCATION: Searles Lake, Calif., center of sec. 13, R. 43 E., T. 26 S., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,621 ft (approx.).

ELEVATION AT BOTTOM OF HOLE: 1,525.5 ft.

TOTAL DEPTH: 95.5 ft.

DATES DRILLED: Nov. 4-29, 1954.

CASING USED: 31.0 ft of 16-in. casing extends from the surface through overburden mud; 70.2 ft of 3-in. pipe extends from the surface into top of lower salt brine.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 18.0 | 18.0 | Overburden mud; not cored. Dense tenacious greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) to medium dark-gray (N 4) clay. |
| 31.5 | 13.5 | Overburden mud; not cored. Grayish-black (N 2) clay with scattered small streaks and pods of dense tenacious dusky yellow-green (5GY 5/2) to black (N 1) clay. |
| 32.9 | 1.4 | Clay and pirssonite. Black (N 1) to grayish-black (N 2) clay with 10 percent disseminated pirssonite crystals averaging 1 mm in length. |
| 33.4 | .5 | Clay and halite. Black (N 1) clay with 50 percent disseminated halite crystals up to 50 mm in length, averaging 15 mm. |
| 34.0 | .6 | Halite, clay, and trona. Well-consolidated vuggy aggregate of clear colorless halite cubes up to 40 mm in length, averaging 10 mm, with greenish-black (5GY 2/1) to dark greenish-gray (5GY 4/1) clay and colorless fibrous trona in interstices of halite crystals. Halite 90 percent, clay 5 percent, trona 5 percent. |
| 34.9 | .9 | No core. |
| 39.5 | 4.6 | Trona, halite, and clay. White (N 9) to yellowish-gray (5Y 8/1) porous massive trona with numerous vuggy seams and streaks, from 1 to 5 mm wide, containing euhedral halite cubes and cubes modified by octahedron, averaging 3 mm in length, with intermixed grayish-black (N 2) clay and fibrous trona in interstices of halite crystals. Trona 85 percent, halite 10 percent, clay 5 percent. |
| 39.8 | .3 | Halite and clay. Poorly consolidated aggregate of white (N 9) to colorless halite cubes averaging 1 mm in length, with 1 percent interstitial dark greenish-gray (5GY 4/1) clay. |
| 40.2 | .4 | No core. |
| 40.8 | .6 | Halite, trona, and clay. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron; discolored by interstitial dark greenish-gray (5GY 4/1) clay; seam, 20 mm wide, of white (N 9) dense massive trona at 40.3 ft. Halite 85 percent, trona 10 percent, clay 5 percent. |

176 GEOLOGIC INVESTIGATIONS IN MOJAVE DESERT REGION

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 41. 5 | 0. 7 | Trona and halite. White (<i>N</i> 9) to light-gray (<i>N</i> 6) porous massive trona with numerous seams, streaks, and disseminated crystals of halite averaging 3 mm in length. Trona 50 percent, halite 50 percent. |
| 42. 2 | . 7 | No core. |
| 42. 6 | . 4 | Halite and trona. Well-consolidated vuggy aggregate of halite cubes and cubes modified by octahedron, averaging 4 mm in length, with streaks and pockets, up to 25 mm wide, of white (<i>N</i> 9) porous massive trona. Halite 50 percent, trona 50 percent. |
| 42. 8 | . 2 | Halite. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with trace of interstitial dark greenish-gray (5GY 4/1 and 5G 4/1) clay. |
| 43. 1 | . 3 | Halite and clay. Well-consolidated aggregate of halite crystals averaging 3 mm in length, with 40 percent interstitial dark greenish-gray (5GY 4/1 and 5G 4/1) clay. |
| 43. 2 | . 1 | Halite. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 43. 5 | . 3 | Halite and clay. Poorly consolidated friable aggregate of halite cubes and cubes modified by octahedron, averaging 2 mm in length, with 15 percent interstitial dark greenish-gray (5GY 4/1 and 5G 4/1) clay. |
| 43. 8 | . 3 | Halite and clay. Unconsolidated aggregate of coarse halite sand with 25 percent intermixed dark greenish-gray (5GY 4/1 and 5G 4/1) to dark-gray (<i>N</i> 3) to grayish-black (<i>N</i> 2) clay. Probably cuttings, not core. |
| 44. 4 | . 6 | Halite, clay, and trona. Well-consolidated vuggy aggregate of halite cubes averaging 3 mm in length, with interstitial colorless fibrous trona and dark greenish-gray (5GY 4/1 and 5G 4/1) clay. Halite 85 percent, clay 10 percent, trona 5 percent. |
| 44. 6 | . 2 | Halite, clay, and trona. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with streaks of black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay, colorless fibrous trona in interstices of halite crystals, and pockets of white (<i>N</i> 9) massive trona, averaging 15 mm in diameter, disseminated throughout. Halite 70 percent, clay 25 percent, trona 5 percent. |
| 44. 7 | . 1 | Trona and clay. White (<i>N</i> 9) soft massive trona with thin streak of dark-gray (<i>N</i> 3) to dark greenish-gray (5GY 4/1) clay. Trona 95 percent, clay 5 percent. |
| 44. 8 | . 1 | Halite. Well-consolidated aggregate of colorless halite cubes averaging 3 mm in length. |
| 45. 0 | . 2 | Halite. Poorly consolidated aggregate of halite cubes, averaging 3 mm in length, with trace of interstitial dark greenish-gray (5GY 4/1) massive trona. |
| 45. 2 | . 2 | Trona. Well-consolidated white (<i>N</i> 9) to light greenish-gray (5GY 8/1) to light olive-gray (5Y 6/1) to greenish-gray (5GY 6/1) soft massive trona. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 45.6 | 0.4 | Trona, clay, halite, and hanksite. White (N 9) to dark-gray (N 3) vuggy massive trona discolored by thin black (N 1) clay streaks; scattered halite cubes and cubes modified by octahedron, in vugs; a few disseminated crystals of euhedral hanksite, averaging 10 mm in length, at base. Trona 83 percent, clay 15 percent, halite 1 percent, hanksite 1 percent. |
| 46.5 | .9 | Halite. Well-consolidated aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, locally discolored dark greenish-gray (5GY 4/1) by trace of interstitial clay. |
| 46.9 | .4 | Halite and trona. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial greenish-black (5GY 2/1) to dark greenish-gray (5GY 4/1) fibrous trona discolored by trace of interstitial clay. |
| 48.1 | 1.2 | Trona. Well-consolidated vuggy aggregate of white (N 9) to light greenish-gray (5G 8/1) to colorless fibrous trona with intermixed dark greenish-gray (5GY 4/1) massive trona. |
| 48.4 | .3 | Trona. Well-consolidated white (N 9) to greenish-gray (5GY 6/1) porous massive trona. |
| 51.8 | 3.4 | No core. |
| 52.0 | .2 | Trona. Fragments of well-consolidated white (N 9) to dark greenish-gray (5GY 4/1) soft porous massive trona. Probably cuttings, not core. |
| 52.1 | .1 | Borax* and clay. Seam, 10 mm wide, of black (N 1) dense clay underlain by seam, 20 mm wide, of colorless massive borax.* Borax 67 percent, clay 33 percent. |
| 53.6 | 1.5 | Clay and pirssonite. Grayish-green (10GY 5/2) to dark greenish-gray (5GY 4/1) to black (N 1) dense faintly finely laminated clay with numerous seams of disseminated pirssonite crystals up to 15 mm in length, averaging 5 mm. Clay 70 percent, pirssonite 30 percent. |
| 54.6 | 1.0 | Clay, pirssonite, and borax. Dusky yellow-green (5GY 5/2) to grayish-green (10GY 5/2) to dark greenish-gray (5GY 4/1 and 5GY 4/1) to grayish-yellow (5Y 8/4) to olive-gray (5Y 3/2) dense finely laminated clay with seam, 10 to 15 mm wide, of massive borax crosscutting laminae at steep angle from 53.6 to 54.6 ft; 40 percent disseminated euhedral pirssonite crystals in lower 0.4 ft. Clay 80 percent, pirssonite 15 percent, borax 5 percent. |
| 58.5 | 2.9 | No core. |
| 59.2 | .7 | Clay and aragonite. Black (N 1) to greenish-black (5GY 2/1) to dark greenish-gray (5GY 4/1) dense clay coarsely laminated with widely spaced seams, averaging 1 mm in width, of very light gray (N 8) to white (N 9) soft massive finely crystalline aragonite. Clay 95 percent, aragonite 5 percent. |
| 59.3 | .1 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) faintly finely laminated clay with 40 percent disseminated euhedral gaylussite crystals from 3 to 10 mm in length. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 60.6 | 1.3 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) to dark greenish-gray (5GY 2/1) to grayish-yellow (5Y 8/4) to very light gray (<i>N</i> 8) to white (<i>N</i> 9) finely laminated clay with a few pockets, 25-50 mm in diameter, of disseminated gaylussite crystals averaging 10 mm in length. Clay 90 percent, gaylussite 10 percent. |
| 60.8 | .2 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) dense clay with 50 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 62.2 | 1.4 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) to dark greenish-gray (5GY 2/1) to grayish-yellow (5Y 8/4) to very light gray (<i>N</i> 8) to white (<i>N</i> 9) dense finely laminated clay. |
| 63.0 | .8 | No core. |
| 63.7 | .7 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) to grayish-yellow (5Y 8/4) to grayish-olive (10Y 4/2) to white (<i>N</i> 9) dense finely laminated clay with a few pockets of disseminated gaylussite crystals averaging 10 mm in length. Clay 98 percent, gaylussite 2 percent. |
| 64.3 | .6 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) to dark-gray (<i>N</i> 3) dense clay with scattered pockets of disseminated gaylussite crystals averaging 10 mm in length; scattered thin streaks less than 1 mm wide and spots of moderate reddish-brown (10R 4/6) algae(?). Clay 95 percent, gaylussite 5 percent. |
| 66.5 | 2.2 | Clay. Grayish-black (<i>N</i> 2) to dark-gray (<i>N</i> 3) to dark greenish-gray (5GY 4/1 and 5G 4/1) to dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) dense faintly coarsely laminated clay with laminae revealed by color differences; faint lamina discolored moderate reddish-orange (10R 6/6) by algae(?) at 65.0 ft. |
| 66.8 | .3 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) dense clay with 50 percent disseminated gaylussite crystals averaging 20 mm in length. |
| 67.2 | .4 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) dense clay with 40 percent disseminated gaylussite crystals averaging 1 mm in length; moderate reddish-orange (10R 6/6) algae(?) discolored streaks and spots throughout. |
| 67.4 | .2 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to greenish-black (5YR 2/1) to moderate olive-brown (5Y 4/4) to light olive-brown (5Y 5/6) clay with 10 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 67.9 | .5 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to grayish-yellow (5Y 8/4) to medium light-gray (<i>N</i> 6) to white (<i>N</i> 9) dense moderately coarsely laminated clay. |
| 68.1 | .2 | No core. |
| 69.5 | 1.4 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) dense clay with 40 percent disseminated gaylussite crystals averaging 1 mm in length. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 69.6 | 0.1 | Trona. White (N 9) to light-gray (N 7) soft porous massive trona with scattered streaks and spots, averaging 1 mm in width, discolored moderate reddish-orange (10R 6/6) by algae(?). |
| 70.0 | .4 | Trona and clay. White (N 9) soft massive trona with seams, 1-3 mm wide, of grayish-black (N 2) clay. Trona 95 percent, clay 5 percent. |
| 70.1 | .1 | Trona and clay. Densely packed aggregate of coarse trona blades with 5 percent interstitial black (N 1) to greenish-black (5GY 2/1) clay. |
| 71.3 | 1.2 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) to moderate olive-brown (5Y 4/4) clay with 10 percent disseminated gaylussite crystals averaging 2 mm in length. |
| 73.0 | 1.7 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) to greenish-black (5GY 2/1) dense clay with 35 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 73.3 | .3 | No core. |
| 73.5 | .2 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) to greenish-black (5GY 2/1) dense clay with 50 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 73.7 | .2 | Clay and trona. Black (N 1) to grayish-black (N 2) dense clay with a few ½-in. lenticular pockets of white (N 9) to light greenish-gray (5GY 8/1) massive trona. Clay 95 percent, trona 5 percent. |
| 75.3 | 1.6 | Trona. White (N 9) to medium-gray (N 5) to yellowish-gray (5Y 7/2) to grayish olive-green (5GY 3/2) compact fibrous trona discolored by trace of clay; a few thin seams of white (N 9) massive trona. |
| 75.8 | .5 | Trona. White (N 9) to greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) porous massive trona with scattered large pockets of coarse bladed trona. |
| 76.3 | .5 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) dense clay with disseminated fine gaylussite sand and silt. Clay 90 percent, gaylussite 10 percent. |
| 77.9 | 1.6 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) to greenish-black (5GY 2/1) to olive-gray (5Y 3/2) clay with 40 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 79.6 | 1.7 | No core. |
| 80.9 | 1.3 | Clay and gaylussite. Greenish-black (5GY 2/1) to black (N 1) clay with 40 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 81.2 | .3 | Clay and gaylussite. Black (N 1) dense clay with 40 percent disseminated gaylussite crystals averaging 1 mm in length. |
| 81.5 | .3 | Clay. Black (N 1) dense clay with a few disseminated gaylussite crystals 1-3 mm in length. |
| 82.2 | .7 | Trona. White (N 9) to dark-gray (N 3) to dark greenish-gray (5GY 4/1) compact fibrous trona discolored by trace of interstitial clay. |
| 82.4 | .2 | Clay and trona. Black (N 1) to grayish-black (N 2) clay with thin irregular seams of white (N 9) massive trona. Clay 70 percent, trona 30 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 83. 1 | 0. 7 | Trona and clay. White (<i>N</i> 9) to greenish-gray (5GY 6/1) porous massive trona with thin seams, 1–3 mm wide, of intermixed dark-gray (<i>N</i> 3) clay and fibrous trona. Trona 98 percent, clay 2 percent. |
| 83. 6 | . 5 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to grayish-yellow (5Y 8/4) faintly laminated clay with a few seams, 1 mm wide, discolored light-brown (5YR 5/6) by algae(?). |
| 83. 8 | . 2 | Trona. White (<i>N</i> 9) to dark-gray (<i>N</i> 3) porous massive trona discolored by trace of intermixed clay. |
| 84. 2 | . 4 | Trona. White (<i>N</i> 9) hard bony massive trona with irregular discolorations of moderate reddish-orange (10R 6/6) algae(?). |
| 85. 3 | 1. 1 | No core. |
| 85. 6 | . 3 | Trona. White (<i>N</i> 9) to dark greenish-gray (5GY 4/1) to dark-gray (<i>N</i> 3) porous massive trona discolored by trace of intermixed clay. |
| 85. 9 | . 3 | Trona and clay. White (<i>N</i> 9) to pale yellowish-brown (10YR 6/2) to grayish-orange (10YR 7/4) to colorless massive and bladed trona in seams, 10–30 mm wide, alternating with seams of black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to yellowish-gray (5Y 7/2) clay; distinct seam of moderate reddish-orange (10R 6/6) to grayish-orange (10YR 7/4) algae(?) discolored clay at top. Trona 60 percent, clay 40 percent. |
| 86. 0 | . 1 | Trona. Coarse aggregate of colorless trona blades averaging 15 mm in length. |
| 86. 4 | . 4 | Clay and northupite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) dense clay with layers of disseminated discrete oval to circular nodules, averaging 1 mm in diameter, of white (<i>N</i> 9) massive northupite. Clay 98 percent, northupite 2 percent. |
| 86. 5 | . 1 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (5GY 2/10) clay with 50 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 86. 9 | . 4 | Clay. Black (<i>N</i> 1) dense faintly finely laminated clay with a few seams, 1 mm wide, of fine gaylussite sand. |
| 87. 1 | . 2 | Clay and trona. Black (<i>N</i> 1) to medium bluish-gray (5B 5/1) dense clay with 30 percent disseminated trona blades averaging 5 mm in length. |
| 87. 7 | . 6 | Trona. White (<i>N</i> 9) to colorless trona blades averaging 5 mm in length; discolored dark greenish-gray (5GY 4/1) by trace of interstitial clay. |
| 87. 9 | . 2 | Clay and northupite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) dense clay with irregular seam, 3–4 mm wide, of pale yellowish-orange (10YR 8/6) massive northupite at base. Clay 95 percent, northupite 5 percent. |
| 88. 4 | . 5 | Clay and northupite. Black (<i>N</i> 1) faintly finely laminated clay with seams of disseminated oval to circular nodules, averaging 1 mm in diameter, of white (<i>N</i> 9) massive northupite in upper 0.2 ft. Clay 99 percent, northupite 1 percent. |
| 88. 6 | . 2 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) dense clay with 50 percent disseminated gaylussite crystals averaging 1 mm in length. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 88.9 | 0.3 | Clay and trona. Black (N 1) to grayish-black (N 2) to very light gray (N 8) dense faintly laminated clay with thin layer of disseminated trona blades averaging 5 mm in length at base. Clay 99 percent, trona 1 percent. |
| 89.5 | .6 | Trona. White (N 9) to grayish-black (N 2) compact fibrous trona with scattered irregular pockets and streaks of white (N 9) massive trona. |
| 90.2 | .7 | Clay. Black (N 1) to grayish-black (N 2) to greenish-black (5GY 2/1) to light olive-gray (5Y 6/1) to dark greenish-gray (5GY 4/1) faintly finely laminated clay. |
| 90.8 | .6 | No core. |
| 91.2 | .4 | Clay. Black (N 1) to grayish-black (N 2) to greenish-black (5GY 2/1) to very light gray (N 7) to grayish-yellow (5Y 8/4) faintly finely laminated clay. |
| 91.7 | .5 | Clay and gaylussite. Greenish-black (5GY 2/1) to grayish-black (N 2) dense clay with 50 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 92.0 | .3 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) clay with 50 percent disseminated gaylussite sand. |
| 93.6 | 1.6 | Clay and gaylussite. Grayish-black (N 2) to greenish-black (5GY 2/1) with clay with 10 percent disseminated gaylussite sand. |
| 93.7 | .1 | Clay. Grayish-black (N 2) to dark greenish-gray (5GY 4/1) dense finely laminated clay. |
| 95.5 | 1.8 | Clay and gaylussite. Dark greenish-gray (5GY 4/1) to black (N 1) to grayish-black (N 2) to greenish-gray (5GY 6/1 and 5G 6/1) to grayish-yellow (5Y 8/4) finely laminated clay with 40 percent disseminated gaylussite crystals averaging 20 mm in length. |

Searles drill hole GS-9

LOCATION: Searles Lake, Calif., about 20 ft east of $\frac{1}{4}$ sec. marker for sec. 5, T. 26 S., and sec. 32, T. 25 S., R. 43 E., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,618 ft.

ELEVATION AT BOTTOM OF HOLE: 1,514.5 ft.

TOTAL DEPTH: 103.5 ft.

DATES DRILLED: Dec. 14-28, 1954.

CASING USED: 36.5 ft of 16-in. casing from surface; 69.7 ft of 3-in. pipe extends from surface to top of lower salt brine.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 37.2 | 37.2 | Clay. Overburden mud, not cored. Pale-olive (10Y 6/2) to dusky yellow-green (5GY 5/2) to greenish gray (5GY 6/1) to black (N 1) clay. |
| 37.6 | 0.4 | Clay and pirssonite*. Black (N 1) to grayish-black (N 2) clay with 50 percent disseminated subhedral pirssonite* crystals averaging 1 mm in length. |
| 37.7 | .1 | Clay and pirssonite. Well-consolidated black (N 1) to grayish-black (N 2) clay with 25 percent disseminated pirssonite crystals averaging 5 mm in length. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 38.2 | 0.5 | Clay, pirssonite, and trona. Well-consolidated dense black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with disseminated fine pirssonite sand; irregular seam, 5–10mm wide, of white (<i>N</i> 9) densely packed fibrous trona at base. Clay 75 percent, pirssonite 20 percent, trona 5 percent. |
| 38.5 | .3 | Trona and clay. Core fractured. Fragments of massive white (<i>N</i> 9) trona to densely packed white (<i>N</i> 9) fibrous trona discolored black (<i>N</i> 1) to greenish-black (5GY 2/1) by irregular thin seams of clay. Trona 95 percent, clay 5 percent. |
| 39.6 | 1.1 | No core. |
| 40.0 | .4 | Trona, halite, and clay. Poorly consolidated mixture of halite cubes less than 1 mm in length, discolored by 5 percent interstitial grayish-black (<i>N</i> 2) to dark greenish-gray (5GY 5/1) clay; mixture contains 50 percent rounded fragments, averaging 2 in. across, of densely packed grayish-black (<i>N</i> 2) to light greenish-gray (5GY 8/1) to dark greenish-gray (5GY 4/1) fibrous trona discolored by trace of interstitial clay. Probably cuttings, not core. Trona 50 percent, halite 45 percent, clay 5 percent. |
| 40.3 | .3 | Hanksite and trona. Well-consolidated vuggy light olive-gray (5Y 6/1) to white (<i>N</i> 9) to colorless granular massive hanksite with a few embedded hanksite crystals averaging 5 mm in length; scattered ½-in. pockets of white (<i>N</i> 9) massive trona. Hanksite 95 percent, trona 5 percent. |
| 40.5 | .2 | Trona and hanksite. Well-consolidated white (<i>N</i> 9) to medium-gray (<i>N</i> 5) to greenish-gray (5GY 6/1) hard massive trona with irregular seams, averaging 5 mm in width, of densely packed colorless hanksite crystals averaging 3 mm in length; trace of grayish-black (<i>N</i> 2) clay with hanksite. Trona 80 percent, hanksite 20 percent. |
| 40.7 | .2 | Halite, trona, and hanksite. Well-consolidated slightly vuggy aggregate of white (<i>N</i> 9) to colorless halite cubes, averaging 2 mm in length, with 20 percent interstitial white (<i>N</i> 9) hard massive trona; scattered pockets and disseminated crystals of colorless hanksite averaging 5 mm in length. Halite 75 percent, trona 20 percent, hanksite 5 percent. |
| 41.2 | .5 | Halite and hanksite. Core fractured. Fragments of densely packed smoky hanksite crystals, averaging 5 mm in length with fragments of densely packed white (<i>N</i> 9) to colorless halite cubes averaging 2 mm in length. Halite 50 percent, hanksite 50 percent. |
| 41.6 | .4 | Hanksite and trona. Well-consolidated vuggy aggregate of densely packed smoky to colorless hanksite crystals from 2 to 20 mm in length, with irregular seams and pockets of white (<i>N</i> 9) to colorless massive and fibrous trona. Hanksite 80 percent, trona 20 percent. |
| 45.7 | 4.1 | No core. |
| 46.2 | .5 | Hanksite and trona. Vuggy aggregate of smoky hanksite crystals averaging 10 mm in length and granular massive hanksite with interstitial grayish-yellow (5Y 8/4) to colorless fibrous trona. Hanksite 90 percent, trona 10 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 46.9 | 0.7 | Hanksite and trona. Well-consolidated dense aggregate of smoky hanksite crystals averaging 10 mm in length, with seam, 15 mm wide, of dark-gray (<i>N</i> 3) to dark greenish-gray (<i>5G</i> 4/1) massive trona at base. Hanksite 93 percent, trona 7 percent. |
| 47.5 | .6 | Hanksite and clay. Friable aggregate of hanksite crystals averaging 25 mm in length, with 10 percent interstitial grayish-black (<i>N</i> 2) clay. |
| 49.3 | 1.8 | No core. |
| 51.6 | 2.3 | Trona and clay. Well-consolidated white (<i>N</i> 9) compact fibrous trona with irregular wavy clay seam, 10 mm wide, of black (<i>N</i> 1) to brownish-gray (<i>5YR</i> 4/1) clay at 50.0 ft; several seams, 1–3 mm wide, of fibrous trona discolored by trace of intermixed clay at 51.0 ft; scattered vuggy horizontal pockets and seams of white (<i>N</i> 9) to pale yellowish-brown (<i>10YR</i> 6/2) massive trona with fibrous trona from 50.6 ft to base. Trona 98 percent, clay 2 percent. |
| 53.3 | 1.7 | No core. |
| 55.8 | 2.5 | Trona. White (<i>N</i> 9) to medium-gray (<i>N</i> 5) soft massive trona with seam of dark-gray (<i>N</i> 3) trona discolored by a trace of intermixed clay at 54.4 to 54.5 ft. |
| 56.5 | .7 | No core. |
| 57.4 | .9 | Trona. White (<i>N</i> 9) soft massive trona with a few seams, 1–2 mm wide, of medium-gray (<i>N</i> 5) trona discolored by trace of clay; wavy seams of white (<i>N</i> 9) to yellowish-gray (<i>5Y</i> 7/2) hard bony massive trona in lower 0.2 ft. |
| 58.3 | .9 | No core. |
| 58.9 | .6 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to grayish-green (<i>5G</i> 5/2) to grayish olive-green (<i>5Y</i> 3/2) to grayish-yellow (<i>5Y</i> 8/4) to greenish-black (<i>5GY</i> 2/1) clay with 30 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 60.8 | 1.9 | Clay and gaylussite. Grayish olive-green (<i>5GY</i> 3/2) to pale olive (<i>10Y</i> 6/2) to olive-gray (<i>10Y</i> 4/2) to greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) faintly finely laminated clay with 25 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 61.6 | .8 | Clay and aragonite*. Grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) clay with widely spaced seams, up to 1 mm wide, of light greenish-gray (<i>5GY</i> 8/1) to very light gray (<i>N</i> 8) soft massive finely crystalline aragonite*; laminae contorted in lower 0.2 ft. Clay 95 percent, aragonite 5 percent. |
| 62.2 | .6 | Clay. Grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) to light greenish-gray (<i>5GY</i> 8/1) to grayish-olive (<i>10Y</i> 4/2) to grayish-yellow (<i>5Y</i> 8/4) to very light gray (<i>N</i> 8) finely laminated clay. |
| 63.0 | .8 | Clay and gaylussite. Olive-black (<i>5Y</i> 2/1) to olive-gray (<i>5Y</i> 3/2) to grayish-black (<i>N</i> 2) to grayish-yellow (<i>5Y</i> 8/4) clay, locally finely laminated, with 30 percent disseminated anhydrous gaylussite crystals up to 20 mm in length, averaging 5 mm. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 63.8 | 0.8 | No core. |
| 65.3 | 1.5 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) to dusky yellow-green (<i>5GY</i> 5/2) to greenish-gray (<i>5G</i> 6/1 and <i>5GY</i> 6/1) to grayish-yellow (<i>5Y</i> 8/4) to very light gray (<i>N</i> 8) finely laminated clay with seams, 15 mm wide, of 90 percent gaylussite crystals averaging 5 mm in length at 63.9, 64.1, 64.8, and 65.0 ft; a few 1- to 2-in. pockets of gaylussite crystals; laminae slightly contorted at base. Clay 90 percent, gaylussite 10 percent. |
| 65.8 | .5 | No core. |
| 66.2 | .4 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1) to grayish olive-green (<i>5GY</i> 3/2) to pale yellowish-green (<i>10GY</i> 7/2) to dark yellowish-orange (<i>10YR</i> 6/6) to very light gray (<i>N</i> 8) finely laminated clay with pockets of gaylussite crystals averaging 15 mm in length. Clay 90 percent, gaylussite 10 percent. |
| 67.0 | .8 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) to grayish olive-green (<i>5GY</i> 3/2) to dark greenish-gray (<i>5G</i> 4/1) coarsely laminated clay; laminae from 10 to 25 mm wide revealed by color differences; with 1 percent disseminated gaylussite crystals averaging 10 mm in length; faint spots and irregular laminae of moderate reddish-brown (<i>10R</i> 4/6) algae?-discolored clay throughout. |
| 68.0 | 1.0 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) to dark greenish-gray (<i>5G</i> 4/1) clay with 20 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 68.5 | .5 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to dusky yellow-green (<i>5GY</i> 5/2) to grayish olive-green (<i>5GY</i> 3/2) coarsely laminated clay revealed by color differences. |
| 68.7 | .2 | Clay and gaylussite. Black (<i>N</i> 1) clay with 50 percent disseminated gaylussite crystals averaging 3 mm in length. |
| 69.5 | .8 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to dusky yellow-green (<i>5GY</i> 5/2) to greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) clay with 50 percent disseminated gaylussite sand. |
| 69.7 | .2 | Clay. Grayish olive-green (<i>5GY</i> 3/2) clay. |
| 69.9 | .2 | Clay and gaylussite. Black (<i>N</i> 1) clay with 50 percent disseminated gaylussite crystals averaging 1 mm in length. |
| 70.7 | .8 | Trona, clay and borax. Dense hard massive white (<i>N</i> 9) trona with 1- to 2-in. pockets of fibrous trona intermixed with blades of trona and a few borax crystals 10 mm long; pockets discolored greenish-black (<i>5GY</i> 2/1) by 5 percent clay. Trona 94 percent, clay 5 percent, borax 1 percent. |
| 72.6 | 1.9 | No core. |
| 72.8 | .2 | Trona and clay. Well-consolidated vuggy aggregate of trona blades averaging 15 mm in length, with 5 percent interstitial greenish-black (<i>5GY</i> 2/1) clay. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 74.4 | 1.6 | Clay and pirssonite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) clay with 40 percent disseminated euhedral to subhedral pirssonite crystals averaging 3 mm in length. |
| 77.5 | 3.1 | Trona. White (<i>N</i> 9) to medium dark-gray (<i>N</i> 4) to dark greenish gray (5GY 4/1) to yellowish-gray (5Y 8/1) compact fibrous trona with irregular pockets and streaks of massive trona. |
| 77.8 | .3 | No core. |
| 79.1 | 1.3 | Trona and halite. White (<i>N</i> 9) to greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) massive vuggy trona with prominent 10- to 20-mm bands of moderate reddish-brown (10R 4/6) algae?-discolorations in trona at top and at 78.7 ft; scattered pockets and irregular streaks of halite cubes modified by octahedron averaging 4 mm in length, some halite cubes with inclusions of moderate reddish-brown (10R 4/6) algae?; a few vugs containing fibrous trona associated with halite. Trona 85 percent, halite 15 percent. |
| 80.3 | 1.2 | Clay and pirssonite. Olive-gray (5Y 3/2) to light olive-brown (5Y 5/6) to grayish olive-green (5GY 3/2) clay with 40 percent disseminated crystals averaging 10 mm in length. |
| 81.3 | 1.0 | Clay and pirssonite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with 40 percent disseminated pirssonite sand. |
| 81.4 | .1 | Trona, clay, and borax. Densely packed aggregate of trona blades with 5 percent interstitial black (<i>N</i> 1) clay; scattered ½-in. pockets of grayish-yellow (5Y 8/4) fibrous trona; embedded borax crystals, up to 50 mm in length, at top. Trona 90 percent, clay 5 percent, borax 5 percent. |
| 81.6 | .2 | Trona. White (<i>N</i> 9) to greenish-gray (5GY 6/1) massive, vuggy trona with numerous pockets of white (<i>N</i> 9) to grayish-yellow (5Y 8/4) fibrous trona. |
| 83.3 | 1.7 | No core. |
| 83.6 | .3 | Trona and clay. Well-consolidated dark-gray (<i>N</i> 3) to greenish-black (5GY 2/1) massive trona discolored by 5 percent intermixed clay; numerous pockets of white (<i>N</i> 9) to grayish-yellow (5Y 8/4) fibrous trona. |
| 83.8 | .2 | Trona and clay. Poorly consolidated aggregate of trona blades averaging 5 mm in length, with 5 percent interstitial dark greenish-gray (5GY 4/1) clay. |
| 85.4 | 1.6 | Halite. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite cubes modified by octahedron, averaging 3 mm in length. |
| 87.5 | 2.1 | No core. |
| 88.5 | 1.0 | Trona. White (<i>N</i> 9) to greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) soft massive trona with irregular streaks and spots of moderate reddish-brown (10R 4/6) algae? throughout. |
| 88.9 | .4 | Clay and northupite*. Black (<i>N</i> 1) to greenish-black (5GY 2/1 and 5G 2/1) faintly finely laminated clay with 1 percent disseminated nodules, averaging 1 mm in diameter, of white (<i>N</i> 9) massive northupite containing minor gaylussite*. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 89. 3 | 0. 4 | Clay and gaylussite. Greenish-black (5GY 2/1 and 5G 2/1) to grayish olive-green (5GY 3/2) to olive-gray (5Y 3/2) clay with 50 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 89. 6 | . 3 | Clay and gaylussite. Greenish-black (5GY 2/1) to very light gray (N 8) faintly finely laminated clay with a few laminae of gaylussite silt. Clay 95 percent, gaylussite 5 percent. |
| 89. 8 | . 2 | Clay. Black (N 1) to grayish-black (N 2) to medium bluish-gray (5B 5/1) clay with irregular streaks of moderate reddish-orange (10R 6/6) algae?-discolored clay. |
| 90. 9 | 1. 1 | Trona and clay. White to pale greenish-yellow (10Y 8/2) dense hard massive trona with pockets containing 60 percent fibrous trona and 40 percent black (N 1) clay in upper 0.2 ft. Trona 97 percent, clay 3 percent. |
| 91. 4 | . 5 | Clay. Black (N 1) to greenish-black (5GY 2/1 and 5G 2/1) to dusky yellow-green (5GY 5/2) to very light gray (N 8) faintly finely laminated clay with a few laminae of gaylussite silt. |
| 91. 7 | . 3 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) clay with 50 percent disseminated gaylussite crystals averaging 1 mm in length. |
| 92. 1 | . 4 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) to medium bluish-gray (5B 5/1) to very light gray (N 8) faintly finely laminated clay with common laminae of gaylussite silt. Clay 95 percent, gaylussite 5 percent. |
| 92. 3 | . 2 | Trona. Dense slightly vuggy aggregate of white (N 9) to grayish-yellow (5Y 8/4) to colorless trona blades averaging 10 mm in length; trace of interstitial clay. |
| 93. 3 | 1. 0 | No core. |
| 94. 3 | 1. 0 | Trona. Well-consolidated compact aggregate of white (N 9) to colorless trona blades averaging 10 mm in length, with scattered pockets of interstitial black (N 1) clay in lower 0.4 ft. |
| 95. 1 | . 8 | Trona and northupite. White (N 9) to yellowish-gray (5Y 8/1) dense hard massive trona with ½ in. pockets, vugs, and irregular seams of colorless fibrous trona; 2 seams, 7 mm wide, of very pale orange (10YR 8/2) to grayish-orange (10YR 7/4) soft massive northupite with 50 percent intermixed fibrous trona from 94.8 to 94.9 ft. Trona 97 percent, northupite 3 percent. |
| 95. 2 | . 1 | Trona and clay. Well-consolidated aggregate of trona blades averaging 5 mm in length, with 50 percent interstitial greenish-black (5GY 2/1 and 5G 2/1) to medium bluish-gray (5B 5/1) clay. |
| 95. 5 | . 3 | Clay and trona. Black (N 1) to greenish-black (5GY 2/1) clay with 20 percent disseminated trona blades averaging 10 mm in length. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 96.2 | 0.7 | Clay and northupite. Black (N 1) to greenish-black (5GY 2/1) to dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) to very light gray (N 8) to white (N 9) finely laminated clay with 1 percent disseminated white (N 9) massive northupite nodules, averaging 1 mm in diameter, in upper 0.2 ft. |
| 96.8 | .6 | Clay and gaylussite. Black (N 1) to olive-black (5Y 2/1) to grayish olive-green (5GY 3/2) to dusky-yellow (5Y 6/4) clay with 40 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 97.0 | .2 | Clay and gaylussite. Black (N 1) to olive-black (5Y 2/1) to greenish-black (5GY 2/1) clay with 50 percent disseminated gaylussite crystals averaging 1 mm in length. |
| 97.9 | .9 | Clay. Well-consolidated dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) to grayish-yellow (5Y 8/4) to grayish-black (N 2) to very light gray (N 8) finely laminated clay. |
| 98.3 | .4 | No core. |
| 98.9 | .6 | Clay and nahcolite*. Black (N 1) to greenish-black (5GY 2/1) to medium bluish-gray (5B 5/1) with irregular stringers and ¼-in. lenticular pockets of white (N 9) massive pulverulent nahcolite*. Clay 65 percent, nahcolite 35 percent. |
| 99.1 | .2 | Clay. Brownish-black (5YR 2/1) to greenish-black (5GY 2/1) to dusky yellow-green (5GY 5/2) finely laminated clay. |
| 103.1 | 4.0 | Clay and gaylussite. Olive-gray (5Y 3/2) to moderate yellowish-brown (10YR 5/4) to dusky-yellow (5Y 6/4) to brownish-black (5YR 2/1) to greenish-black (5GY 2/1 and 5G 2/1) to medium bluish-gray (5B 5/1) finely laminated clay with 35 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 103.5 | .4 | No Core. |

Searles drill hole GS-10

LOCATION: Searles Lake, Calif., about 190 feet east of east 1/16 sec. cor., sec. 33,

T. 25 S., and sec. 4, T. 26 S., R. 43 E., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,618 ft.

ELEVATION AT BOTTOM OF HOLE: 1,498.1 ft.

TOTAL DEPTH: 119.9 ft.

DATES DRILLED: Dec. 29, 1954, to Jan. 13, 1955.

CASING USED: 32.2 ft of 16-in. casing; 83.9 ft of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 7.2 | 7.2 | Overburden mud, not cored. Moderate yellowish-brown (10YR 5/4) clay. |
| 18.5 | 11.3 | Overburden mud, not cored. Dusky yellow-green (5GY 5/2) clay. |
| 32.4 | 13.9 | Overburden mud, not cored. Black (N 1) clay. |
| 32.8 | .4 | Clay and pirssonite. Black (N 1) clay with 40 percent disseminated pirssonite crystals averaging 5 mm in length. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 32.9 | 0.1 | Halite and clay. Well-consolidated aggregate of halite cubes and anhedral, averaging 5 mm in length, with 5 percent interstitial black (N 1) clay. |
| 33.7 | .8 | Clay and pirssonite. Well-consolidated black (N 1) clay with 40 percent disseminated pirssonite crystals averaging 10 mm in length. |
| 33.8 | .1 | Halite and clay. Well-consolidated aggregate of halite cubes and anhedral, averaging 3 mm in length, with 5 percent interstitial black (N 1) clay. |
| 34.4 | .6 | Clay and pirssonite. Black (N 1) clay with 10 percent disseminated pirssonite crystals averaging 2 mm in length and pockets of pirssonite crystals. |
| 34.7 | .3 | Halite and clay. Well-consolidated aggregate of halite cubes averaging 3 mm in length, with 5 percent interstitial black (N 1) clay. |
| 35.3 | .6 | Clay and pirssonite. Well-consolidated black (N 1) clay with 50 percent disseminated pirssonite crystals averaging 5 mm in length. |
| 35.4 | .1 | Halite and clay. Well-consolidated aggregate of halite cubes and anhedral, averaging 3 mm in length, with 5 percent interstitial black (N 1) clay. |
| 35.7 | .3 | Clay and pirssonite*. Black (N 1) clay with 20 percent disseminated pirssonite* sand. |
| 35.9 | .2 | Halite and clay. Well-consolidated aggregate of halite cubes averaging 3 mm in length, with 5 percent interstitial black (N 1) clay. |
| 36.3 | .4 | Clay and pirssonite. Black (N 1) clay with 20 percent disseminated pirssonite sand. |
| 36.5 | .2 | Halite and clay. Well-consolidated aggregate of halite cubes averaging 2 mm in length, with 15 percent interstitial black (N 1) to greenish-black (5GY 2/1 and 5G 2/1) clay. |
| 36.7 | .2 | Halite and trona. Well-consolidated aggregate of halite crystals averaging 2 mm in length, with 40 percent interstitial dark greenish-gray (5GY 4/1 and 5G 4/1) massive trona. |
| 36.9 | .2 | Trona and halite. Well-consolidated slightly vuggy aggregate of white (N 9) massive trona with 40 percent halite crystals disseminated throughout and concentrated in vuggy pockets. |
| 37.6 | .7 | Halite and trona. Well-consolidated vuggy aggregate of halite cubes averaging 3 mm in length, with 25 percent greenish-gray (5GY 6/1) to dark greenish-gray (5G 4/1) massive trona in lenticular pockets and irregular seams, averaging 10 mm in width; trace of interstitial greenish-black (5GY 2/1) to greenish-gray (5GY 6/1) clay. |
| 38.0 | .4 | No core. |
| 39.0 | 1.0 | Clay and pirssonite*. Well-consolidated black (N 1) clay with 40 percent disseminated pirssonite* crystals averaging 2 mm in length. |
| 39.1 | .1 | Halite and trona. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 2 mm in length, with 50 percent intermixed dark greenish-gray (5GY 4/1 and 5G 4/1) massive trona. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 39.2 | 0.1 | Trona. White (N 9) soft massive trona. |
| 39.4 | .2 | Halite and trona. Well-consolidated aggregate of halite cubes modified by octahedron, averaging 4 mm in length, with 1 percent interstitial dark greenish-gray (5GY 4/1 and 5G 4/1) massive trona. |
| 39.6 | .2 | Halite and trona. Poorly consolidated aggregate of halite cubes modified by octahedron, averaging 4 mm in length, with 1 percent interstitial dark greenish-gray (5YG 4/1 and 5G 4/1) massive trona. |
| 40.4 | .8 | Clay and pirssonite. Black (N 1) clay with 40 percent disseminated pirssonite crystals averaging 2 mm in length. |
| 40.8 | .4 | Halite. Well-consolidated dense aggregate of white (N 9) to colorless halite crystals averaging 4 mm in length. |
| 41.0 | .2 | Clay and pirssonite.* Poorly consolidated soft black (N 1) clay with 30 percent black (N 1) crystal fragments of pirssonite* disseminated throughout. |
| 42.6 | 1.6 | No core. |
| 43.1 | .5 | Halite and trona. Friable aggregate of halite cubes and cubes modified by octahedron, averaging 4 mm in length, with 30 percent dark greenish-gray (5G 4/1) fibrous trona in irregular streaks. |
| 43.7 | .6 | Halite and trona. Well-consolidated slightly vuggy aggregate of halite cubes and cubes modified by octahedron, averaging 2 mm in length, with intermixed irregular streaks of white (N 9) massive trona and streaks of dark greenish-gray (5G 4/1) fibrous trona. Halite 50 percent, trona 50 percent. |
| 44.0 | .3 | Trona, halite, and clay. Poorly consolidated mixture of fragments consisting of aggregates of dark greenish-gray (5G 4/1) fibrous trona with disseminated halite crystals averaging 3 mm in length; pockets and streaks of white (N 9) massive trona throughout; core discolored by 5 percent intermixed greenish-black (5GY 2/1 and 5G2/1) clay. Trona 75 percent, halite 20 percent, clay 5 percent. |
| 44.6 | .6 | Trona and halite. White (N 9) to yellowish-gray (5Y 8/1) dense hard slightly vuggy massive trona with disseminated crystals and irregular streaks of colorless halite. Trona 60 percent, halite 40 percent. |
| 45.3 | .7 | No core. |
| 45.4 | .1 | Hanksite. Densely packed aggregate of dark-gray (N 3) anhedral hanksite crystals averaging 10 mm in length. |
| 45.7 | .3 | Halite and trona. Well-consolidated slightly vuggy aggregate of halite cubes with 30 percent interstitial white (N 9) massive trona. |
| 45.8 | .1 | Halite and clay. Well-consolidated aggregate of halite cubes averaging 3 mm in length, with 5 percent interstitial black (N 1) to greenish-black (5GY 2/1) clay. |
| 46.1 | .3 | Trona and halite. Well-consolidated white (N 9) vuggy massive trona with disseminated halite crystals throughout; halite cubes modified by octahedron, averaging 3 mm in length, lining narrow horizontal lenticular vugs. Trona 60 percent, halite 40 percent. |

190 GEOLOGIC INVESTIGATIONS IN MOJAVE DESERT REGION

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 46.3 | 0.2 | Trona, halite, and clay. Well-consolidated white (N 9) to dark greenish-gray (5GY 4/1) vuggy massive trona with numerous narrow lenticular vugs lined with halite cubes averaging 2 mm in length; irregular streaks of black (N 1) clay throughout. Trona 80 percent, halite 10 percent, clay 10 percent. |
| 47.0 | .7 | Halite. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 2 mm in length; discolored by trace of greenish-gray (5GY 6/1) clay. |
| 47.5 | .5 | Trona and halite. Fractured core. White (N 9) hard vuggy massive trona with disseminated halite crystals and irregular streaks of halite crystals averaging 2 mm in length. Trona 60 percent, halite 40 percent. |
| 47.7 | .2 | Halite and trona. Well-consolidated aggregate of halite cubes averaging 3 mm in length, with scattered ¼-in pockets of white (N 9) massive trona. Halite 98 percent, trona 2 percent. |
| 48.4 | .7 | Trona and halite. Well-consolidated white (N 9) vuggy massive trona with 50 percent disseminated halite crystals averaging 2 mm in length. |
| 48.5 | .1 | Halite. Well-consolidated aggregate of halite crystals averaging 2 mm in length; discolored by trace of interstitial greenish-gray (5GY 6/1) clay. |
| 48.6 | .1 | Clay and hanksite. Black (N 1) clay with large disseminated hanksite crystals averaging 30 mm in length. Clay 50 percent, hanksite 50 percent. |
| 48.7 | .1 | Halite and trona. Well-consolidated aggregate of halite crystals averaging 2 mm in length, with seams, 1-2 mm wide, of white (N 9) massive trona. Halite 80 percent, trona 20 percent. |
| 49.9 | 1.2 | No core. |
| 50.2 | .3 | Hanksite. Fractured core. Fragments of hard dense granular massive colorless to faint smoky hanksite. |
| 50.6 | .4 | Hanksite. Hard dense massive colorless to smoky hanksite. |
| 51.0 | .4 | Trona and halite. White (N 9) massive vuggy trona with disseminated halite crystals averaging 4 mm in length; numerous horizontal lenticular vugs lined with euhedral halite cubes modified by octahedron, averaging 4 mm in length. Trona 60 percent, halite 40 percent. |
| 51.3 | .3 | Halite and trona. Core fractured. Well-consolidated aggregate of halite cubes modified by octahedron, with seams of white (N 9) massive trona. Halite 50 percent, trona 50 percent. |
| 51.4 | .1 | Hanksite. Hard dense massive colorless hanksite. |
| 52.8 | 1.4 | No core. |
| 53.0 | .2 | Trona and halite. Well-consolidated white (N 9) to dark greenish-gray (5GY 4/1) slightly vuggy massive trona with pockets of euhedral halite cubes modified by octahedron, averaging 3 mm in length. Trona 90 percent, halite 10 percent. |
| 53.3 | .3 | Hanksite. Dense hard massive smoky hanksite. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 53.8 | 0.5 | Hanksite, trona, and halite. Fractured core. Fragments of colorless to brownish-smoky granular massive hanksite containing pockets and thin seams of white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) massive trona; fragments of granular massive hanksite at base, containing seam of halite cubes averaging 3 mm in length. Hanksite 78 percent, trona 20 percent, halite 2 percent. |
| 54.2 | .4 | No core. |
| 54.8 | .6 | Hanksite, halite, and trona. Fractured core. Fragments of colorless to smoky granular massive hanksite with ¼-in. pockets of halite cubes averaging 3 mm and pockets up to several inches long of dark greenish-gray (5GY 4/1) massive trona. Hanksite 70 percent, halite 20 percent, trona 10 percent. |
| 55.1 | .3 | Hanksite. Massive dense hard smoky hanksite. |
| 55.5 | .4 | Halite and trona. Well-consolidated white (<i>N</i> 9) to colorless halite cubes averaging 3 mm in length, with 20 percent interstitial white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) massive trona. |
| 55.6 | .1 | Trona. Well-consolidated white (<i>N</i> 9) to yellowish-gray (5Y 8/1) dense compact massive trona. |
| 56.9 | 1.3 | No core. |
| 59.0 | 2.1 | Hanksite, trona, and clay. Well-consolidated vuggy aggregate of euhedral hanksite crystals up to 60 mm in length, averaging 30 mm; interstitial dark greenish-gray (5GY 4/1) massive trona in lower 0.1 ft; scattered pockets of black (<i>N</i> 1) clay and grayish-yellow (5Y 8/4) fibrous trona in interstices of hanksite crystals in lower 1.0 ft. Hanksite 95 percent, trona 4 percent, clay 1 percent. |
| 59.3 | .3 | Trona. Greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) vuggy massive trona with numerous thin horizontal lenticular vuggy seams lined with colorless fibrous trona. |
| 59.8 | .5 | Trona. Well-consolidated greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) massive trona. |
| 60.3 | .5 | Hanksite and trona. Dense hard massive brownish smoky hanksite with 1- to 2-in. pockets of white (<i>N</i> 9) to colorless fibrous trona. Hanksite 90 percent, trona 10 percent. |
| 65.1 | 4.8 | No core. |
| 65.7 | .6 | Trona and hanksite. Well-consolidated white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) to light olive-gray (5Y 6/1) slightly vuggy massive trona with seams, 5 mm wide, of massive smoky hanksite. Trona 80 percent, hanksite 20 percent. |
| 66.0 | .3 | Trona. Fractured core. Fragments of white (<i>N</i> 9) to yellowish-gray (5Y 7/2) soft massive trona. |
| 66.2 | .2 | No core. |
| 68.5 | 2.3 | Trona. White (<i>N</i> 9) to light greenish-gray (5GY 8/1) soft massive trona. |
| 69.1 | .6 | No core. |
| 70.3 | 1.2 | Trona. White (<i>N</i> 9) soft massive trona. |
| 71.1 | .8 | No core. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 71.5 | 0.4 | Clay and pirssonite. Grayish-green (10GY 5/2) and (10G 4/2) to dusky yellow-green (5GY 5/2) to moderate-yellow (5Y 7/6) to black (N 1) finely laminated clay with seam, 10 mm wide, of black (N 1) clay containing 50 percent disseminated pirssonite crystals averaging 1 mm in length at base. Clay 96 percent, pirssonite 4 percent. |
| 72.3 | .8 | Clay and gaylussite*. Olive-gray (5Y 3/2) to olive-black (5Y 2/1) to grayish-green (10GY 5/2) clay, locally faintly finely laminated, with 35 percent disseminated gaylussite* crystals averaging 10 mm in length. |
| 73.0 | .7 | Clay and gaylussite. Grayish-green (10GY 5/2) to olive-black (5Y 2/1) to medium bluish-gray (5B 5/1) to very light gray (N 8) finely laminated clay with 1- to 2-in. pockets and disseminated crystals of gaylussite averaging 15 mm in length. Clay 90 percent, gaylussite 10 percent. |
| 73.9 | .9 | Clay and aragonite. Black (N 1) to greenish-black (5GY 2/1) to grayish-green (10GY 5/2) clay coarsely laminated with widely spaced laminae, up to 1 mm wide, of moderate olive-brown (5Y 4/4) to very light gray soft finely crystalline massive (N 8) aragonite. Clay 95 percent, aragonite 5 percent. |
| 74.5 | .6 | Clay and aragonite. Black (N 1) to greenish-black (5GY 2/1) clay coarsely laminated with widely spaced laminae, up to 1 mm wide, of soft finely crystalline massive aragonite. Clay 95 percent, aragonite 5 percent. |
| 75.1 | .6 | Clay and gaylussite*. Black (N 1) to olive-black (5Y 2/1) to olive-gray (5Y 3/2) to grayish-yellow (5Y 8/4) to grayish-green (10GY 5/2) to very light gray (N 8) finely laminated clay with seam, 15 mm wide, of 50 percent disseminated gaylussite* crystals averaging 5 mm in length at 75.0 ft. Clay 96 percent, gaylussite 4 percent. |
| 75.2 | .1 | No core. |
| 77.2 | 2.0 | Clay and gaylussite. Black (N 1) to dark greenish-gray (5GY 4/1 and 5G 4/1) to grayish-yellow (5Y 8/4) to dark yellowish-orange (10YR 6/6) to moderate olive-brown (5Y 4/4) to very light gray (N 8) to white (N 9) dense finely laminated clay with scattered pockets of disseminated gaylussite* crystals averaging 5 mm in length. Clay 98 percent, gaylussite 2 percent. |
| 77.8 | .6 | No core. |
| 78.3 | .5 | Clay. Pale-olive (10Y 6/2) to dusky yellow-green (5GY 5/2) to olive-gray (5Y 3/2) to grayish-yellow (5Y 8/4) to light olive-brown (5Y 5/6) to pale greenish-yellow (10Y 8/2) to dark yellowish-orange (10YR 6/6) to medium bluish-gray (5B 5/1) to white (N 9) dense finely laminated clay. |
| 79.1 | .8 | Clay and gaylussite*. Black (N 1) to dusky yellow-green (5GY 5/2) to medium bluish-gray (5B 5/1) to very light gray (N 8) to white (N 9) finely laminated clay with 50 percent anhedral gaylussite* crystals and irregular intergrown gaylussite and clay masses up to 2 in. in length. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 81.2 | 2.1 | Clay and gaylussite. Pale-olive (10Y 6/2) to dusky-yellow (5Y 6/4) to medium bluish-gray (5B 5/1) to olive-gray (5Y 3/2) coarsely laminated clay revealed by color differences with 40 percent disseminated anhedral gaylussite crystals; a few laminae, 1 mm wide, of moderate reddish-orange (10R 6/6) algae(?) -discolored clay. |
| 81.7 | .5 | Clay and pirssonite. Black (N 1) to greenish-black (5GY 2/1) clay with 40 percent disseminated euhedral pirssonite crystals averaging 5 mm in length. |
| 82.0 | .3 | No core. |
| 83.1 | 1.1 | Clay and pirssonite. Black (N 1) to greenish-black (5GY 2/1) clay with 40 percent disseminated euhedral pirssonite crystals averaging 5 mm in length. |
| 84.0 | .9 | Trona and clay. Compact vuggy aggregate of colorless trona blades averaging 10 mm, with irregular pockets and streaks of greenish-gray (5GY 6/1) massive trona; 5 percent interstitial greenish-black (5GY 2/1) to dark greenish-gray (5GY 4/1) clay; a few moderate reddish-brown (10R 4/2) irregular algae(?) -discolored streaks in clay. |
| 84.3 | .3 | Trona and borax. Dense slightly vuggy aggregate of colorless trona blades averaging 10 mm in length, with 10 percent disseminated subhedral to euhedral borax crystals averaging 5 mm in length. |
| 84.9 | .6 | Clay, pirssonite, and borax. Black (N 1) clay with 30 percent disseminated coarse pirssonite sand and 5 percent disseminated euhedral borax crystals averaging 5 mm in length. |
| 85.5 | .6 | Clay and pirssonite. Black (N 1) to dusky yellow-green (5GY 5/2) clay with 50 percent disseminated euhedral pirssonite crystals averaging 2 mm in length. |
| 85.7 | .2 | No core. |
| 86.4 | .7 | Clay and pirssonite. Black (N 1) to greenish-black (5GY 2/1) clay with 35 percent disseminated euhedral pirssonite crystals averaging 5 mm in length. |
| 87.0 | .6 | Trona. Well-consolidated compact aggregate of white (N 9) to dark greenish-gray (5GY 4/1) fibrous trona. |
| 90.0 | 3.0 | Trona and halite. Well-consolidated white (N 9) to greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) vuggy massive trona with disseminated crystals and lenticular pockets of halite cubes and cubes modified by octahedron, up to 10 mm in length, averaging 3 mm; vugs lined with halite crystals containing interstitial fine fibrous trona; irregular moderate reddish-orange (10R 6/6) algae(?) discolorations in halite crystals and in massive trona at 87.8 ft, and in massive trona at 88.5 and 89.6 ft. Trona 80 percent, halite 20 percent. |
| 90.3 | .3 | No core. |
| 92.4 | 2.1 | Clay and pirssonite. Black (N 1) to greenish-black (5GY 2/1) clay with 40 percent disseminated euhedral pirssonite crystals averaging 5 mm in length. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 93.1 | 0.7 | Trona, clay, and pirssonite. White (<i>N</i> 9) to grayish-green (10GY 5/2) massive trona with irregular seams of intermixed black (<i>N</i> 1) to greenish-black (5GY 2/1) clay and fibrous trona; pockets of white (<i>N</i> 9) to colorless fibrous trona; scattered euhedral prismatic borax crystals, 5 mm long, disseminated in a trona-clay seam in upper 0.1 ft; black (<i>N</i> 1) clay seam, 10 mm wide, at 92.9 ft, containing 25 percent disseminated euhedral pirssonite crystals averaging 2 mm in length. Trona 95 percent, clay 4 percent, pirssonite 1 percent. |
| 93.7 | .6 | Halite and trona. Friable aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm, with seam, 10 mm wide, of white (<i>N</i> 9) grayish-green (10GY 5/2) massive trona at 93.4 ft. Halite 95 percent, trona 5 percent. |
| 93.9 | .2 | Halite and trona. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 30 percent interstitial white (<i>N</i> 9) massive trona in pockets and irregular seams. |
| 94.1 | .2 | Burkeite*, trona*, and borax*. Hard dense very slightly vuggy massive yellowish-gray (5Y 7/2) intermixed burkeite* and trona* with minor borax*. Burkeite 70 percent, trona 25 percent, borax 5 percent. |
| 94.6 | .5 | Halite, trona, and clay. Fractured core. Fragments of dusky yellow-green (5GY 5/2) to colorless fibrous trona with irregular seams of interstitial black (<i>N</i> 1) clay; fragments consisting of aggregates of halite cubes and cubes modified by octahedron, averaging 5 mm in length. Halite 50 percent, trona 48 percent, clay 2 percent. |
| 94.8 | .2 | Trona. White (<i>N</i> 9) to grayish-green (10GY 5/2) to grayish olive-green (5GY 3/2) dense hard massive trona discolored by trace of clay. |
| 95.8 | 1.0 | No core. |
| 96.1 | .3 | Trona. Poorly consolidated white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) soft massive trona. Probably cuttings, not core. |
| 96.3 | .2 | Burkeite*. Pale yellowish-orange (10YR 8/6) dense hard massive burkeite*. |
| 96.6 | .3 | Halite. Friable aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 97.0 | .4 | Trona and burkeite. White (<i>N</i> 9) to light greenish-gray (5GY 8/1) dense massive trona with 1- to 3-in. pockets of pale yellowish-orange (10YR 8/6) dense hard massive burkeite. Trona 80 percent, burkeite 20 percent. |
| 97.4 | .4 | Halite and trona. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with a few 1-in. pockets of white (<i>N</i> 9) massive trona. Halite 98 percent, trona 2 percent. |
| 97.5 | .1 | Trona. Well-consolidated white (<i>N</i> 9) soft massive trona. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 97.9 | 0.4 | Halite. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 98.1 | .2 | Halite and trona. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 20 percent interstitial white (<i>N</i> 9) to greenish-gray (<i>5GY</i> 6/1) soft massive trona. |
| 98.5 | .4 | Trona, halite, and clay. White (<i>N</i> 9) to greenish-gray (<i>5GY</i> 6/1) soft massive trona with seam, 10 mm wide, of white (<i>N</i> 9) to colorless halite crystals in upper 0.1 ft and irregular thin black (<i>N</i> 1) clay streaks in lower 0.2 ft. Trona 90 percent, halite 8 percent, clay 2 percent. |
| 98.9 | .4 | Halite. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 99.2 | .3 | Trona and halite. White (<i>N</i> 9) to greenish-gray (<i>5GY</i> 6/1) soft massive trona with numerous seams of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length; numerous streaks, less than 1 mm wide, of moderate reddish-orange (<i>10R</i> 6/6) algae(?) discolorations in trona and as inclusions in halite crystals. Halite 50 percent, trona 50 percent. |
| 99.5 | .3 | Halite and burkeite. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with seam, 10 mm wide, of pale yellowish-orange (<i>10YR</i> 8/6) hard dense massive burkeite at base. Halite 90 percent, burkeite 10 percent. |
| 100.1 | .6 | Halite and trona. Fractured core. Poorly consolidated fragments of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, with 10 percent interstitial white (<i>N</i> 9) to greenish-gray (<i>5GY</i> 6/1) soft massive trona. |
| 100.6 | .5 | No core. |
| 100.8 | .2 | Halite and trona. Well-consolidated aggregate of halite cubes averaging 2 mm in length, with 5 percent interstitial white (<i>N</i> 9) soft massive trona. |
| 101.0 | .2 | Burkeite. Pale yellowish-orange (<i>10YR</i> 8/6) hard dense massive burkeite. |
| 101.2 | .2 | Trona and halite. White (<i>N</i> 9) to greenish-gray (<i>5GY</i> 6/1) soft massive trona with 1- to 2-in. pockets of colorless halite cubes modified by octahedron, averaging 3 mm in length; irregular streaks of trona discolored medium-gray (<i>N</i> 5) by trace of clay. Trona 85 percent, halite 15 percent. |
| 101.5 | .3 | Halite, trona, and burkeite. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with thin seams, 1-3 mm wide, of white (<i>N</i> 9) soft massive trona; pockets, 1 in. long, of pale yellowish-orange (<i>10YR</i> 8/6) hard massive burkeite at 101.4 ft. Halite 90 percent, trona 5 percent, burkeite 5 percent. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 101.6 | 0.1 | Trona and northupite*. White (N 9) to dark-gray (N 3) dense hard massive trona with seam, 3 mm wide, of grayish-orange (10YR 7/4) soft massive northupite* containing minor intermixed gaylussite* at base. Trona 90 percent, northupite 10 percent. |
| 102.0 | .4 | Clay and borax. Black (N 1) to greenish-black (5GY 2/1) to grayish-yellow green (5GY 3/2) to very light gray (N 8) dense finely laminated clay with seam, 15 mm wide, of 40 percent disseminated euhedral prismatic borax crystals averaging 5 mm in length at 101.9 ft; seam, 1 mm wide, of 60 percent disseminated gaylussite crystals at base; 3 seams, 1 mm wide, of moderate reddish-orange (10 R 6/6) algae(?)-discolored clay from 101.6 to 101.7 ft. Clay 95 percent, borax 5 percent. |
| 102.2 | .2 | Trona and halite. White (N 9) to light greenish-gray (5GY 8/1) hard massive trona with 5 percent halite crystals in scattered pockets, 1 in. long. |
| 102.4 | .2 | Trona and halite. Fractured core. White (N 9) to light greenish-gray (5GY 8/1) massive trona with pockets of halite crystals averaging 3 mm in length. Trona 90 percent, halite 10 percent. |
| 102.5 | .1 | Burkeite. Greyish-orange (10YR 7/4) hard dense massive burkeite. |
| 102.7 | .2 | Burkeite and trona. Fractured core. Fragments of grayish-orange (10YR 7/4) hard dense massive burkeite with interstitial dark greenish-gray (5GY 4/1) soft massive trona containing distinct irregular seams, 1 mm wide, of light-brown (5YR 6/4) algae(?) discolored trona. Burkeite 80 percent, trona 20 percent. |
| 104.8 | 2.1 | No core. |
| 105.3 | .5 | Clay, borax, and northupite. Black (N 1) to greenish-black (5GY 2/1) to light greenish-gray (5GY 8/1) to very light gray (N 8) finely laminated clay with seams of disseminated round to oval nodules, averaging 1 mm in diameter, of white (N 9) massive northupite; seam, 15 mm wide, of 50 percent disseminated euhedral borax crystals, averaging 15 mm in length, in black (N 1) clay at top. Clay 90 percent, borax 5 percent, northupite 5 percent. |
| 105.5 | .2 | Clay and gaylussite. Greenish-black (5GY 2/1) to black (N 1) clay with 50 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 105.6 | .1 | Clay and gaylussite. Black (N 1) clay with 50 percent disseminated clear colorless euhedral gaylussite crystals averaging 2 mm in length. |
| 106.0 | .4 | Clay and northupite*. Black (N 1) to grayish-black (N 2) to greenish-black (5GY 2/1) to very light gray (N 8) faintly finely laminated clay with 2 distinct seams, 1 mm wide, of grayish-orange (10YR 7/4) massive northupite* containing minor intermixed gaylussite* in lower 0.1 ft. Clay 98 percent, northupite 2 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 106. 5 | 0. 5 | Trona and clay. Densely packed aggregate of radiating trona blades averaging 25 mm in length, with 25 percent interstitial black (<i>N</i> 1) clay; a few euhedral borax crystals, averaging 10 mm in length, at top. |
| 107. 0 | . 5 | Hanksite and trona. Well-consolidated vuggy aggregate of euhedral hanksite crystals with prominent basal pinacoid up to 35 mm in length, averaging 20 mm, associated with interstitial colorless trona blades averaging 20 mm in length. Hanksite 65 percent, trona 35 percent. |
| 107. 3 | . 3 | Trona, hanksite, and clay. White (<i>N</i> 9) to greenish-gray (5GY 6/1) vuggy massive trona, with numerous pockets of bladed trona; large vug at base containing hanksite crystals showing prominent basal pinacoid up to 35 mm in length, with interstitial black (<i>N</i> 1) clay. Trona 80 percent, hanksite 15 percent, clay 5 percent. |
| 107. 8 | . 5 | No core. |
| 108. 0 | . 2 | Clay. Greenish-black (5GY 2/1) to very light gray (<i>N</i> 8) faintly finely laminated clay. |
| 108. 2 | . 2 | Clay and gaylussite. Greenish-black (5GY 2/1) clay with 50 percent disseminated clear colorless euhedral gaylussite crystals averaging 1 mm in length. |
| 108. 4 | . 2 | Clay. Black (<i>N</i> 1) to dark-gray (<i>N</i> 3) to greenish-black (5GY 2/1) to very light gray (<i>N</i> 8) faintly finely laminated clay. |
| 108. 5 | . 1 | Trona*. Dark greenish-gray (5GY 4/1 and 5G 4/1) dense hard massive trona* with vugs of trona blades averaging 5 mm in length; seam, 10 mm wide, of coarse colorless to white (<i>N</i> 9) trona blades, averaging 20 mm in length, at top. |
| 109. 5 | 1. 0 | Trona. Vuggy aggregate of colorless trona blades averaging 10 mm in length, with pockets of white (<i>N</i> 9) massive trona and local interstitial dark greenish-gray (5G 4/1) massive trona. |
| 109. 6 | . 1 | Trona*. Aggregate of colorless trona blades containing pockets of white (<i>N</i> 9) massive trona; interstitial very pale orange (10YR 8/2) soft massive trona*. |
| 109. 8 | . 2 | Trona. Dense hard massive trona with seam, 10 mm wide, of colorless trona blades averaging 5 mm in length at top. |
| 109. 9 | . 1 | Clay. Black (<i>N</i> 1) to greenish-black (5GY 2/1) to very light gray (<i>N</i> 8) faintly finely laminated clay. |
| 110. 0 | . 1 | Thenardite*. Vuggy aggregate of tabular thenardite* crystals averaging 10 mm in length. |
| 110. 1 | . 1 | Clay. Black (<i>N</i> 1) to dusky yellow-green (5GY 5/2) to very light gray (<i>N</i> 8) faintly finely laminated clay. |
| 110. 3 | . 2 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with 50 percent disseminated gaylussite crystals averaging 1 mm in length. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 110.9 | 0.6 | Clay. Black (<i>N</i> 1) to greenish-gray (<i>5GY</i> 6/1) to dusky yellow-green (<i>5GY</i> 5/2) to very light gray (<i>N</i> 8) finely laminated clay. |
| 111.0 | .1 | Clay and gaylussite. Greenish-black (<i>5GY</i> 2/1) clay with 50 percent disseminated gaylussite sand. |
| 111.1 | .1 | Trona and clay. Hard dense aggregate of trona blades with 50 percent interstitial greenish-black (<i>5GY</i> 2/1) clay. |
| 111.3 | .2 | Trona. Dark greenish-gray (<i>5GY</i> 4/1) hard dense massive trona. |
| 111.7 | .4 | Well-consolidated aggregate of colorless trona blades discolored by 2 percent interstitial greenish-black (<i>5GY</i> 2/1) clay; interstitial pockets of white (<i>N</i> 9) soft to hard massive trona. |
| 113.8 | 1.7 | No core. |
| 114.5 | .7 | Trona*. Well-consolidated aggregate of colorless trona blades averaging 10 mm in length with pockets of dark greenish-gray (<i>5GY</i> 4/1) massive trona; local interstitial very pale orange (<i>10YR</i> 8/2) soft massive trona* at 109.5 to 109.6 ft. |
| 115.1 | .6 | Clay and trona. Black (<i>N</i> 1) to grayish olive-green (<i>5GY</i> 3/2) to greenish-black (<i>5GY</i> 2/1) to very light gray (<i>N</i> 8) finely laminated clay with seams, 5 mm wide, of colorless trona blades averaging 3 mm in length at 114.6 ft. Clay 97 percent, trona 3 percent. |
| 116.9 | 1.8 | Clay and gaylussite. Black (<i>N</i> 1) to olive-gray (<i>5Y</i> 3/2) clay with 50 percent disseminated euhedral colorless gaylussite crystals up to 40 mm in length, averaging 10 mm. |
| 117.3 | .4 | Clay and gaylussite. Grayish-yellow (<i>5Y</i> 8/4) to dark yellowish-orange (<i>10YR</i> 6/6) to medium bluish-gray (<i>5B</i> 5/1) to olive-gray (<i>5Y</i> 3/2) finely laminated clay with 5 percent disseminated gaylussite crystals averaging 3 mm in length. |
| 118.2 | .9 | Clay and gaylussite. Olive-gray (<i>5Y</i> 3/2) to medium bluish-gray (<i>5B</i> 5/1) to dusky yellowish-brown (<i>10YR</i> 2/2) finely laminated clay with 35 percent disseminated euhedral gaylussite crystals from 1 to 30 mm in length, averaging 10 mm. |
| 118.5 | .3 | Clay and gaylussite. Dark yellowish-orange (<i>10YR</i> 6/6) to medium bluish-gray (<i>5B</i> 5/1) to olive-gray (<i>5Y</i> 3/2) to very light gray (<i>N</i> 8) finely laminated clay with 2 percent disseminated anhedral gaylussite crystals averaging 10 mm in length. |
| 118.7 | .2 | Clay and gaylussite. Olive-gray (<i>5Y</i> 3/2) to moderate olive-brown (<i>5Y</i> 4/4) to pale yellowish-orange (<i>10YR</i> 8/6) coarsely laminated clay with 40 percent disseminated euhedral gaylussite crystals averaging 15 mm in length. |
| 119.9 | 1.2 | No core. |

Searles drill hole GS-11

LOCATION: Searles Lake, Calif., approx. 12 ft east of common cor., secs. 25 and 36, R. 43 E., and secs. 30 and 31, R. 44 E., T. 25 S., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,616 ft.

ELEVATION AT BOTTOM OF HOLE: 1,491.2 ft.

TOTAL DEPTH: 124.8 ft.

DATES DRILLED: Dec. 13, 1954, to Jan. 24, 1955.

CASING USED: 85.5 ft. of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 1.0 | 1.0 | Halite. Not cored; friable aggregate of colorless cubes and cubes modified by octahedron, averaging 5 mm in length. |
| 1.4 | .4 | Halite. Unconsolidated aggregate of colorless halite cubes and cubes modified by octahedron, up to 40 mm in length, averaging 4 mm; halite discolored dusky yellow-green (5GY 5/2) by trace of interstitial clay. Probably cuttings, not core. |
| 1.7 | .3 | Halite and clay. Consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 20 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 1.9 | .2 | Halite and clay. Poorly consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent interstitial dusky yellow-green clay. |
| 2.6 | .7 | No core. |
| 3.1 | .5 | Halite and clay. Unconsolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent interstitial dusky yellow-green (5GY 5/2) clay. Probably cuttings, not core. |
| 3.3 | .2 | Halite and clay. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, up to 20 mm in length; averaging 4 mm; with 5 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 3.5 | .2 | Clay and halite. Grayish-green (5G 5/2) to greenish-gray (5G 6/1) clay with 30 percent disseminated halite cubes and cubes modified by octahedron, up to 20 mm in length. |
| 3.9 | .4 | Hanksite and clay. Dense aggregate of hanksite crystals averaging 25 mm in length, with 5 percent interstitial dusky yellow-green (5GY 5/2) clay; a few hanksite crystals showing basal pinacoid. |
| 4.0 | .1 | Clay. Greenish-black (5GY 2/1 and 5G 2/1) to grayish-black (N 2) clay. |
| 4.5 | .5 | No core. |
| 4.9 | .4 | Halite and clay. Poorly consolidated aggregate of halite anhedra and subhedra, averaging 25 mm in length, with 50 percent interstitial grayish-green (10GY 5/2) clay. Probably cuttings, not core. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 5.8 | 0.9 | Clay and halite. Grayish-green (10GY 5/2) to dusky yellow-green (5GY 5/2) dense tenacious clay with irregular layers and streaks of grayish-black (N 2) clay; 10 percent loose disseminated halite anhedral and subhedral averaging 25 mm in length. |
| 5.9 | .1 | No core. |
| 6.2 | .3 | Clay and halite. Grayish-green (10GY 5/2) tenacious clay with 50 percent loose disseminated halite crystals averaging 3 mm in length. Probably cuttings, not core. |
| 6.9 | .7 | Clay and halite. Grayish-green (10GY 5/2) to grayish-black (N 2) dense clay with 50 percent disseminated glassy halite crystals in aggregates up to 4 in. long. |
| 7.0 | .1 | No core. |
| 7.2 | .2 | Clay. Grayish-green (10GY 5/2) to grayish-black (N 2) clay. |
| 7.5 | .3 | Halite and clay. Well-consolidated aggregate of halite anhedral averaging 20 mm in length, with 10 percent interstitial grayish-green (10GY 5/2) to grayish-black (N 2) clay. |
| 7.8 | .3 | Clay and halite. Grayish-green (10GY 5/2) clay with irregular streaks and pockets of grayish-black (N 2) clay; 20 percent disseminated halite crystals averaging 15 mm in length. |
| 8.0 | .2 | Halite and clay. Well-consolidated aggregate of halite crystals averaging 15 mm in length, with 10 percent interstitial grayish-green (10GY 5/2) to grayish-black (N 2) clay. |
| 8.9 | .9 | Clay and halite. Greenish-black (5GY 2/1 and 5G 2/1) to grayish-black (N 2) dense clay with 5 percent disseminated halite crystals averaging 20 mm in length. |
| 9.7 | .8 | Clay. Greenish-black (5GY 2/1 and 5G 2/1) to grayish-black (N 2) dense clay. |
| 9.9 | .2 | Halite and clay. Well-consolidated aggregate of halite anhedral averaging 25 mm in length, with 5 percent interstitial greenish-black (5GY 2/1 and 5G 2/1) clay. |
| 10.2 | .3 | Clay. Greenish-black (5GY 2/1 and 5G 2/1) to grayish-black (N 2) dense tenacious clay. |
| 10.3 | .1 | Halite and clay. Well-consolidated aggregate of halite anhedral averaging 20 mm in length, with 5 percent interstitial greenish-black (5GY 2/1 and 5G 2/1) clay. |
| 10.6 | .3 | Clay. Greenish-black (5GY 2/1 and 5G 2/1) to grayish-black (N 2) dense clay. |
| 10.7 | .1 | Halite and clay. Well consolidated aggregate of halite crystals averaging 20 mm in length with 10 percent interstitial greenish-black (5GY 2/1 and 5G 2/1) to grayish-black (N 2) clay. |
| 10.9 | .2 | Clay. Greenish-black (5GY 2/1) to grayish-black (N 2) clay. |
| 11.0 | .1 | Halite and hanksite. Unconsolidated mixture of halite crystals and hanksite crystals averaging 20 mm in length; a few hanksite crystals with basal pinacoid present. Halite 50 percent, hanksite 50 percent. Probably cuttings, not core. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 11.4 | 0.4 | Clay. Greenish-black (5GY 2/1 and 5G 2/1) to grayish-black (N 2) dense clay. |
| 12.4 | 1.0 | Halite and clay. Well-consolidated aggregate of halite crystals averaging 10 mm in length, with 20 percent interstitial greenish-black (5GY 2/1 and 5G 2/1) to grayish-black (N 2) clay. |
| 12.8 | .4 | No core. |
| 13.9 | 1.1 | Clay and halite. Greenish-black (5GY 2/1 and 5G 2/1) to grayish-black (N 2) dense clay with 50 percent disseminated halite crystals averaging 10 mm in length. |
| 14.3 | .4 | Clay and halite. Poorly consolidated grayish-green (10GY 5/2 to greenish-black (5GY 2/1 and 5G 2/1) clay with 50 percent disseminated halite cubes averaging 2 mm in length. |
| 15.2 | .9 | No core. |
| 16.1 | .9 | Halite and clay. Well-consolidated aggregate of halite crystals averaging 5 mm in length, with 5 percent interstitial greenish-black (5GY 2/1 and 5G 2/1) clay. |
| 16.3 | .2 | Clay. Greenish-black (5GY 2/1 and 5G 2/1) dense clay. |
| 16.4 | .1 | Halite and clay. Well-consolidated aggregate of halite crystals averaging 5 mm in length, with 5 percent interstitial greenish-black (5GY 2/1 and 5G 2/1) clay. |
| 17.1 | .7 | No core. |
| 17.9 | .8 | Halite and clay. Well-consolidated aggregate of halite crystals averaging 5 mm in length, with 5 percent interstitial greenish-black (5GY 2/1 and 5G 2/1) clay. |
| 18.1 | .2 | No core. |
| 19.1 | 1.0 | Halite and clay. Well-consolidated aggregate of halite crystals averaging 3 mm in length, with 5 percent interstitial greenish-black (5GY 2/1 and 5G 2/1) clay. |
| 20.1 | 1.0 | Halite and clay. Poorly consolidated friable aggregate of halite crystals averaging 3 mm in length, with 5 percent interstitial greenish-black (5GY 2/1 and 5G 2/1) clay; seam, 10 mm wide, of grayish-black (N 2) clay at base. |
| 20.8 | .7 | Halite, trona, and clay. Poorly consolidated mixture of medium dark-gray (N 4) to dark greenish-gray (5GY 4/1) massive trona with disseminated halite crystals averaging 10 mm in length; intermixed grayish-black (N 2) to greenish-black (5GY 2/1 and 5G 2/1) clay. Halite 50 percent, trona 30 percent, and clay 20 percent. May be cuttings, not core. |
| 21.4 | .6 | Trona and halite. Well-consolidated massive medium dark-gray (N 4) to dark greenish-gray (5GY 4/1) trona with 10 percent disseminated halite crystals averaging 2 mm in length. |
| 21.6 | .2 | No core. |
| 21.9 | .3 | Halite and clay. Unconsolidated aggregate of halite cubes averaging 1 mm in length, with 10 percent intermixed grayish-red (N 2) to greenish-black (5GY 2/1 and 5G 2/1) clay. Probably cuttings, not core. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 22. 5 | 0. 6 | Halite and clay. Well-consolidated aggregate of halite crystals averaging 5 mm in length, with 10 percent interstitial grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) clay. |
| 22. 6 | . 1 | No core. |
| 23. 3 | . 7 | Trona and halite. Dark greenish-gray (<i>5GY</i> 4/1) soft massive trona with 50 percent halite cubes, averaging 1 mm in length, disseminated throughout; scattered 1- to 2-in. pockets of white (<i>N</i> 9) dense hard massive trona discolored by black (<i>N</i> 1) clay streaks. |
| 23. 8 | . 5 | Trona and hanksite. Core fractured. Well-consolidated white (<i>N</i> 9) hard dense massive trona with scattered ¼-in. pockets of fibrous trona; irregular greenish-black (<i>5GY</i> 2/1) to grayish-black (<i>N</i> 2) seams of dense granular massive hanksite with trace of intermixed clay. Trona 90 percent, hanksite 10 percent. |
| 24. 1 | . 3 | No core. |
| 24. 5 | . 4 | Trona and halite. Unconsolidated greenish-gray (<i>5GY</i> 4/1) soft massive trona with 40 percent disseminated halite sand. Probably cuttings, not core. |
| 24. 8 | . 3 | Hanksite. Well-consolidated slightly vuggy hard granular massive hanksite. |
| 24. 9 | . 1 | No core. |
| 25. 7 | . 8 | Trona and halite. Unconsolidated dark greenish-gray (<i>5GY</i> 4/1) soft massive trona with 40 percent disseminated halite cubes averaging 1 mm in length. Probably cuttings, not core. |
| 26. 7 | 1. 0 | Halite and clay. Poorly consolidated mixture of halite crystals averaging 3 mm in length, with 5 percent intermixed black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) clay, a few fragments of hanksite crystals or densely packed hanksite crystal aggregates. May be cuttings, not core. |
| 27. 4 | . 7 | No core. |
| 28. 0 | . 6 | Hanksite and clay. Granular massive hanksite with scattered lenticular pockets of fibrous trona; irregular seams of greenish-black (<i>5GY</i> 2/1) clay; densely packed aggregates consisting of hanksite crystals, up to 30 mm in length, in upper 0.1 ft, with 10 percent interstitial greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) clay. Hanksite 95 percent, clay 5 percent. |
| 28. 8 | . 8 | Hanksite, clay, and borax. Granular massive hanksite and densely packed hanksite crystal aggregates containing interstitial black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1 and <i>5G</i> 2/1) clay; a few disseminated borax crystals up to 1-in. long. Hanksite 90 percent, clay 10 percent. |
| 30. 7 | 1. 9 | No core. |
| 32. 6 | 1. 9 | Trona and halite. Poorly consolidated mixture of dark greenish-gray (<i>5GY</i> 4/1) soft massive trona with 10 percent disseminated halite crystals averaging 1 mm in length; scattered fragments of white (<i>N</i> 9) hard massive trona and a few rounded aggregates of densely packed hanksite crystals. May be cuttings, not core. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 32. 8 | 0. 2 | Hanksite. Densely packed aggregate of white (N 9) colorless hanksite crystals. |
| 33. 7 | . 9 | No core. |
| 33. 9 | . 2 | Hanksite. Densely packed aggregate of white (N 9) to colorless hanksite crystals. |
| 34. 3 | . 4 | Hanksite and clay. Aggregate of large hanksite crystals up to 5 in. long, with 10 percent interstitial black (N 1) to greenish-black (5GY 2/1 and 5G 2/1) clay. |
| 35. 7 | 1. 4 | Clay and hanksite. Black (N 1) to greenish-black (5GY 2/1 and 5G 2/1) clay with 25 percent disseminated euhedral hanksite crystals averaging 25 mm in length. |
| 35. 8 | . 1 | No core. |
| 36. 2 | . 4 | Trona. Core fractured. Dark greenish-gray (5GY 4/1) soft massive trona with a few disseminated hanksite crystals. |
| 36. 6 | . 4 | Hanksite. Well-consolidated, densely packed aggregate of white (N 9) to colorless hanksite crystals. |
| 38. 4 | 1. 8 | Hanksite, halite, and clay. Fractured core. Fragments of densely packed white (N 9) to colorless hanksite crystals with interstitial seams of grayish-black (N 2) to greenish-black (5GY 2/1) clay; scattered pockets of halite and fibrous trona. Hanksite 90 percent, halite 5 percent, clay 5 percent. |
| 38. 5 | . 1 | No core. |
| 39. 2 | . 7 | Trona and halite. Unconsolidated mixture of dark greenish-gray (5GY 4/1) soft massive trona with intermixed colorless halite sand; a few hanksite crystals 25-30 mm long. Trona 50 percent, halite 50 percent. Probably cuttings, not core. |
| 39. 5 | . 3 | Trona* and halite*. Well-consolidated aggregate of white (N 9) to colorless hard massive intermixed trona* and halite*. Trona 60 percent, halite 40 percent. |
| 39. 9. | . 4 | Hanksite, clay, and sulfohalite. Dense granular aggregate of smoky hanksite crystals with 5 percent interstitial greenish-black (5GY 2/1) clay; seam, 10 mm wide, of 10 percent disseminated sulfohalite octahedra, averaging 5 mm in length, at base. Hanksite 95 percent, clay 5 percent. |
| 41. 3 | 1. 4 | Hanksite. Dense granular slightly vuggy aggregate of colorless hanksite crystals with irregular streaks, 10 mm wide, of granular massive smoky hanksite; trace of colorless fibrous trona in vugs. |
| 41. 4 | . 1 | No core. |
| 42. 0 | . 6 | Trona. Unconsolidated dark greenish-gray (5GY 4/1) soft massive trona. May be cuttings, not core. |
| 43. 7 | 1. 7 | Halite and clay. Core fractured. Poorly consolidated friable aggregate of colorless halite crystals averaging 3 mm in length, with irregular pockets and seams of interstitial black (N 1) clay. Halite 85 percent, clay 15 percent. |
| 44. 7 | 1. 0 | Trona and hanksite. Greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) soft massive trona* with disseminated euhedral hanksite crystals up to 70 mm in length. Trona 95 percent, hanksite 5 percent. |
| 45. 3 | . 6 | Hanksite. Well-consolidated dense granular slightly vuggy aggregate of white (N 9) to colorless hanksite crystals. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 46.0 | 0.7 | Hanksite and clay. Well-consolidated dense aggregate of smoky hanksite crystals with 5 percent interstitial greenish-black (5GY 2/1) clay. |
| 46.6 | .6 | Hanksite. Dense granular slightly vuggy aggregate of white (N 9) to colorless hanksite. |
| 46.8 | .2 | Hanksite and clay. Dense granular aggregate of white (N 9) to colorless hanksite with 5 percent interstitial greenish-black (5GY 2/1) clay. |
| 47.6 | .8 | No core. |
| 47.7 | .1 | Hanksite. Dense granular slightly vuggy aggregate of white (N 9) to colorless hanksite; trace of trona. |
| 48.1 | .4 | Hanksite. Dense granular aggregate of white (N 9) to colorless to smoky hanksite; 2 percent greenish-gray (5GY 6/1) massive trona in thin seams and pockets in lower 0.1 ft with a few pockets of colorless halite cubes averaging 3 mm in length. |
| 48.3 | .2 | Trona. Poorly consolidated white (N 9) to dark greenish-gray (5GY 4/1) soft massive trona. May be cuttings, not core. |
| 48.8 | .5 | Trona and hanksite. Well-consolidated white (N 9) to colorless vuggy massive trona with irregular streaks of granular massive smoky hanksite; vugs occur as narrow horizontal seams. Trona 90 percent, hanksite 10 percent. |
| 49.0 | .2 | Halite and trona. Unconsolidated mixture of fragments consisting of aggregates of halite cubes averaging 3 mm in length, with intermixed seams and interstitial white (N 9) to dark greenish-gray (5GY 4/1) massive trona. Halite 75 percent, trona 25 percent. |
| 49.8 | .8 | Halite and trona. Well-consolidated white (N 9) to dark greenish-gray (5GY 4/1) massive trona with narrow seams of halite cubes and cubes modified by octahedron and disseminated halite cubes, averaging 3 mm in length. Halite 50 percent, trona 50 percent. |
| 50.0 | .2 | Halite. Well-consolidated aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 50.1 | .1 | No core. |
| 50.5 | .4 | Trona and halite. White (N 9) to greenish-gray (5GY 6/1 and 5G 6/1) massive trona with irregular seams and disseminated crystals of halite averaging 3 mm in length. Trona 75 percent, halite 25 percent. |
| 50.7 | .2 | No core. |
| 50.8 | .1 | Trona. Well-consolidated dark greenish-gray (5GY 4/1) soft massive trona. |
| 51.3 | .5 | Halite and hanksite. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 2 mm in length, with large pockets, 4-5 in. long, of granular massive smoky hanksite. Halite 60 percent, hanksite 40 percent. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 51.8 | 0.5 | Trona and halite. Well-consolidated white (<i>N</i> 9) to very pale orange (10YR 8/2) massive trona with vuggy seams, averaging 3 mm in width, lined with halite cubes and cubes modified by octahedron, averaging 3 mm in length. Trona 90 percent, halite 10 percent. |
| 52.1 | .3 | Halite. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 52.6 | .5 | Trona and halite. White (<i>N</i> 9) to very pale orange (10YR 8/2) massive trona with numerous vuggy seams, averaging 1 to 3 mm in width, lined with halite cubes and cubes modified by octahedron. Trona 80 percent, halite 20 percent. |
| 53.1 | .5 | Halite, burkeite*, borax*, and trona*. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 4 mm in length, with irregular seams and interstitial fillings of white (<i>N</i> 9) to very pale orange (10YR 8/2) massive intermixed burkeite*, halite*, and borax*, with minor trona*; trace of greenish-black (5GY 2/1) clay in interstices of halite in lower 0.2 ft. Halite 80 percent, burkeite 20 percent. Borax and trona estimated less than 1 percent. |
| 55.6 | 2.5 | No core. |
| 56.0 | .4 | Trona. Unconsolidated greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) soft massive trona. Probably cuttings, not core. |
| 56.1 | .1 | Burkeite* and hanksite. Well-consolidated very pale orange (10YR 8/2) to grayish-orange (10YR 7/4) vuggy massive burkeite*; vugs lined with colorless hanksite crystals averaging 5 mm in length, with trace of dark greenish-gray (5GY 4/1) hard massive trona. Burkeite 95 percent, hanksite 5 percent. |
| 56.9 | .8 | Halite and trona. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, with 1 percent interstitial white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) massive trona. |
| 57.0 | .1 | Hanksite. Well-consolidated white (<i>N</i> 9) to brownish smoky hard dense granular massive hanksite. |
| 58.3 | 1.3 | No core. |
| 59.0 | .7 | Burkeite and hanksite. Well-consolidated very pale orange (10YR 8/2) to grayish-orange (10YR 7/4) hard massive burkeite with irregular seams, averaging 10 mm wide and pockets averaging 1 in. long, of colorless hanksite crystals 5 mm in length. Burkeite 85 percent, hanksite 15 percent. |
| 59.8 | .8 | Halite, burkeite, and hanksite. Well-consolidated white (<i>N</i> 9) to very pale orange (10YR 8/2) hard massive burkeite with irregular seams averaging 5 mm in width and disseminated crystals of halite averaging 3 mm in length; 1-in. pockets of smoky hanksite crystals, averaging 10 mm in length, in lower 0.2 ft. Halite 50 percent, burkeite 45 percent, hanksite 5 percent. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 60.7 | 0.9 | Halite. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with trace of interstitial grayish-green (5G 5/2) soft massive trona. |
| 61.0 | .3 | No core. |
| 61.2 | .2 | Hanksite and trona. Dark smoky dense hard granular massive hanksite with seam, 5 mm wide, of white (N 9) massive trona at top. Hanksite 92 percent, trona 8 percent. |
| 61.6 | .4 | Halite. Well-consolidated aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length. |
| 62.0 | .4 | Hanksite and clay. Dark smoky dense hard granular massive hanksite with irregular thin streaks, averaging 2 mm in width, of black (N 1) clay. Hanksite 95 percent, clay 5 percent. |
| 63.0 | 1.0 | Halite and trona. Well-consolidated aggregate of white (N 9) to colorless halite cubes up to 10 mm in length, averaging 3 mm, with 10 percent interstitial light greenish-gray (5GY 8/1) to greenish-gray (5GY 6/1) massive trona. |
| 63.5 | .5 | Trona and halite. Well-consolidated slightly vuggy white (N 9) massive trona with seam, 10 mm wide, of halite cubes and cubes modified by octahedron, averaging 5 mm in length, at 63.3 ft; scattered 1-in. lenticular pockets and vugs, containing halite cubes and cubes modified by octahedron, averaging 3 mm in length. Trona 90 percent, halite 10 percent. |
| 63.8 | .3 | Trona and halite. Fractured core. Large fragments of well-consolidated yellowish-gray (5Y 8/1) massive trona with 50 percent disseminated halite crystals averaging 2 mm in length. |
| 64.2 | .4 | Trona and clay. White (N 9) to light-gray (N 7) dense massive trona with irregular thin streaks and seams of olive-black (5Y 2/1) to olive-gray (5Y 3/2) clay. Trona 95 percent, clay 5 percent. |
| 64.8 | .6 | Halite and trona. Well-consolidated aggregate of halite cubes averaging 3 mm in length, with 5 percent interstitial colorless fibrous trona. |
| 65.5 | .7 | No core. |
| 66.1 | .6 | Trona and hanksite. Well-consolidated white (N 9) to yellowish-gray (5Y 7/2) dense hard massive trona with 2-in. pockets of smoky granular massive hanksite. Trona 90 percent, hanksite 10 percent. |
| 66.3 | .2 | Trona* and halite*. Dense hard aggregate of white (N 9) massive trona* with 50 percent disseminated halite* cubes averaging 3 mm in length. |
| 67.2 | .9 | No core. |
| 67.8 | .6 | Trona and halite. Well-consolidated white (N 9) to dark greenish-gray (5G 4/1) soft massive trona with 50 percent disseminated halite crystals averaging 3 mm in length. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 67.9 | 0.1 | Trona. Well-consolidated pale yellowish-brown (10YR 6/2) massive trona. |
| 68.0 | .1 | Trona. Well-consolidated slightly vuggy aggregate of greenish-gray (5G 6/1) to dark greenish-gray (5G 4/1) compact fine fibrous trona. |
| 68.6 | .6 | Trona. Fractured core. Large fragments of light olive-gray (5Y 6/1) to greenish-gray (5GY 6/1) soft massive trona. |
| 71.4 | 2.8 | No core. |
| 72.5 | 1.1 | Trona. Well-consolidated white (N 9) to light-gray (N 7) to greenish-gray (5GY 6/1) slightly vuggy massive trona. |
| 72.7 | .2 | Borax*, clay, and pirssonite. Well-consolidated granular aggregate of white (N 9) to colorless borax* crystals averaging 3 mm in length, with seam at base, 10 mm wide, of black (N 1) to greenish-black (5GY 2/1) clay containing 30 percent disseminated euhedral pirssonite crystals and 20 percent disseminated borax* crystals. Borax 87 percent, clay 8 percent, pirssonite 5 percent. |
| 73.0 | .3 | Clay. Medium bluish-gray (5B 5/1) to dark greenish-gray (5G 4/1) to dark yellowish-orange (10YR 6/6) to brownish-black (5YR 2/1) dense finely laminated clay. |
| 73.2 | .2 | Clay and pirssonite*. Olive-gray (5Y 3/2) to black (N 1) to light-brown (5YR 5/6) clay with 30 percent disseminated anhedral pirssonite* crystals averaging 10 mm in length. |
| 73.4 | .2 | Clay and pirssonite. Greenish-black (5GY 2/1) to dusky yellowish-green (10GY 3/2) to grayish olive-green (5GY 3/2) to dusky yellow-green (5GY 5/2) faintly finely laminated clay with numerous thin seams, less than 1 mm wide, of anhedral pirssonite. Clay 90 percent, pirssonite 10 percent. |
| 73.8 | .4 | Clay. Dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) to olive-gray (5Y 3/2) to grayish-yellow (5Y 8/4) to grayish-green (5G 5/2) to grayish-black (N 2) dense finely laminated clay. |
| 74.2 | .4 | Clay and gaylussite. Olive gray (5Y 3/2) to dusky yellow-green (5GY 5/2) to very light gray (N 8) dense finely laminated clay with 40 percent disseminated gaylussite crystals averaging 15 mm in length. |
| 74.4 | .2 | Clay. Black (N 1) to greenish-black (5GY 2/1) to grayish olive-green (5GY 3/2) to olive-gray (5Y 3/2) to very light gray (N 8) finely laminated clay. |
| 75.4 | 1.0 | Clay. Grayish olive-green (5GY 3/2) to greenish-black (5GY 2/1) to olive-gray (5Y 3/2) to brownish-black (5YR 2/1) to light greenish-gray (5GY 8/1) dense finely laminated clay. |
| 75.8 | .4 | Clay and aragonite. Greenish-black (5GY 2/1) to grayish olive-green (5GY 3/2) to moderate olive-brown (5Y 4/4) coarsely laminated clay with widely spaced laminae, averaging 1 mm wide, of light greenish-gray (5GY 8/1) to very light gray (N 8) soft massive finely crystalline aragonite. Clay 95 percent, aragonite 5 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 77. 1 | 1. 3 | Clay. Grayish-black (<i>N</i> 2) to dusky yellow-green (<i>5GY</i> 5/2) to dusky-brown (<i>5YR</i> 2/2) to dark yellowish-orange (<i>10YR</i> 6/6) to medium bluish-gray (<i>5B</i> 5/1) to very light gray (<i>N</i> 8) finely laminated clay. |
| 77. 7 | . 6 | No core. |
| 78. 1 | . 4 | Clay. Medium bluish-gray (<i>5B</i> 5/1) to greenish-gray (<i>5G</i> 6/1) to dark yellowish-orange (<i>10YR</i> 6/6) to very light-gray (<i>N</i> 8) dense finely laminated clay. |
| 78. 2 | . 1 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1) clay with numerous seams, 1 mm wide, of anhedral gaylussite. Clay 50 percent, gaylussite 50 percent. |
| 78. 5 | . 3 | Clay. Medium bluish-gray (<i>5B</i> 5/1) to greenish-gray (<i>5G</i> 6/1) to dark yellowish-orange (<i>10YR</i> 6/6) to grayish-black (<i>N</i> 2) to very light gray (<i>N</i> 8) dense finely laminated clay; laminae contorted in lower 0.1 ft. |
| 78. 9 | . 4 | Clay and gaylussite. Greenish-gray (<i>5GY</i> 6/1) to dark-gray (<i>N</i> 3) to dark yellowish-orange (<i>10YR</i> 6/6) to dusky yellow-green (<i>5GY</i> 5/2) to moderate olive-brown (<i>5Y</i> 4/4) to very light gray (<i>N</i> 8) dense finely laminated clay with a few pockets of anhedral gaylussite crystals. Clay 99 percent, gaylussite 1 percent. |
| 79. 5 | . 6 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1) clay with numerous seams, 1 mm wide, of light greenish-gray (<i>5GY</i> 8/1) anhedral gaylussite. Clay 90 percent, gaylussite 10 percent. |
| 80. 1 | . 6 | Clay, gaylussite, and borax*. Greenish-gray (<i>5GY</i> 6/1) to dark greenish-gray (<i>5GY</i> 4/1) to light olive-brown (<i>5Y</i> 5/6) to greenish-black (<i>5GY</i> 2/1) to very light gray (<i>N</i> 8) clay with numerous seams, averaging 1 mm in width, of light greenish-gray (<i>5Y</i> 8/1) anhedral gaylussite; clay is finely laminated in lower 0.2 ft with seam, 15 mm wide, of massive borax at 80.0 ft. Clay 82 percent, gaylussite 10 percent, borax 8 percent. |
| 81. 2 | 1. 1 | Clay and gaylussite. Greenish-black (<i>5GY</i> 2/1) to black (<i>N</i> 1) to medium bluish-gray (<i>5B</i> 5/1) to grayish-yellow (<i>5Y</i> 8/4) coarsely laminated clay with laminae revealed by color differences; scattered pockets of anhedral gaylussite crystals. Clay 99 percent, gaylussite 1 percent. |
| 81. 5 | . 3 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-gray (<i>5G</i> 6/1) coarsely laminated clay; laminae revealed by color differences. |
| 82. 1 | . 6 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with 10 percent disseminated fine gaylussite sand and silt. |
| 82. 5 | . 4 | No core. |
| 82. 8 | . 3 | Clay and gaylussite.* Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with 10 percent disseminated gaylussite* silt. |
| 83. 3 | . 5 | Clay and pirssonite. Black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1) clay with 50 percent disseminated clear euhedral pirssonite crystals averaging 2 mm in length. |
| 83. 5 | . 2 | Clay. Dusky yellow-green (<i>5GY</i> 5/2) to grayish-green (<i>5G</i> 5/2) clay. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 84.5 | 1.0 | Halite, trona*, clay, and pirssonite. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite crystals averaging 3 mm in length, with 25 percent interstitial colorless fibrous trona and scattered pockets of white (<i>N</i> 9) massive trona*; irregular black (<i>N</i> 1) clay streaks and traces of interstitial black (<i>N</i> 1) clay, with clay in streaks containing 30 percent clear colorless euhedral pirssonite crystals averaging 1 mm in length and irregular spots and streaks, 1-5 mm long, of moderate reddish-brown (10R 4/6) algae?-discolored clay. Halite 60 percent, trona 30 percent, clay 7 percent, pirssonite 3 percent. |
| 87.5 | 3.0 | No core. |
| 88.2 | .7 | Clay and pirssonite. Fractured core. Fragments of black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with 40 percent disseminated euhedral pirssonite crystals averaging 2 mm in length. |
| 88.9 | .7 | Clay, gaylussite*, and borax. Black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with 40 percent disseminated gaylussite* crystals from 1 to 10 mm in length; scattered subhedral borax crystals, averaging 20 mm in length, at base. Clay 59 percent, gaylussite 40 percent, borax 1 percent. |
| 89.2 | .3 | Trona and clay. White (<i>N</i> 9) compact fibrous trona locally discolored dark-gray (<i>N</i> 3) by 5 percent intermixed clay. |
| 90.6 | 1.4 | Halite, trona, and clay. Well-consolidated aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with 30 percent white (<i>N</i> 9) massive to fine fibrous trona in pockets and interstices of halite crystals; locally discolored by 1 percent intermixed grayish-black (<i>N</i> 2) clay. |
| 91.2 | .6 | Trona and halite. Well-consolidated white (<i>N</i> 9) massive slightly vuggy trona with 40 percent disseminated halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 91.5 | .3 | Halite. Friable aggregate of colorless halite cubes modified by octahedron, averaging 5 mm in length. |
| 92.0 | .5 | No core. |
| 93.0 | 1.0 | Halite, trona, and clay. Unconsolidated mixture of dark greenish-gray (5GY 4/1) halite sand, clay, and trona. Halite 85 percent, trona 10 percent, clay 5 percent. Probably cuttings, not core. |
| 93.2 | .2 | Trona and halite. Well-consolidated white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) massive trona with 10 percent disseminated halite cubes modified by octahedron, averaging 3 mm in length. |
| 94.2 | 1.0 | Clay and pirssonite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with 35 percent disseminated euhedral pirssonite crystals averaging 5 mm in length. |
| 94.9 | .7 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with 50 percent disseminated anhedral pirssonite crystals. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 95.2 | 0.3 | Clay, pirssonite, and borax. Black (N 1) clay with 40 percent disseminated euhedral pirssonite crystals averaging 1 mm in length; seam, 20 mm wide, of granular aggregate of borax crystals, averaging 5 mm in length, at base. Clay 50 percent, pirssonite 30 percent, borax 20 percent. |
| 95.4 | .2 | Trona and clay. Fractured core. Fragments of white (N 9) massive trona with pockets of fibrous trona, locally discolored dark gray (N 3) to grayish black (N 2) by streaks of intermixed clay. Trona 95 percent, clay 5 percent. |
| 95.6 | .2 | Halite. Friable aggregate of colorless halite cubes modified by octahedron, averaging 5 mm in length, with trace of interstitial black (N 1) clay. |
| 95.7 | .1 | Clay and pirssonite. Black (N 1) clay with 50 percent disseminated euhedral pirssonite crystals averaging 1 mm in length. |
| 95.8 | .1 | Trona and clay. Well-consolidated aggregate of colorless fibrous trona with 5 percent interstitial black (N 1) clay. |
| 96.2 | .4 | Halite, trona, and clay. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 5 mm in length, with 2 percent interstitial grayish-black (N 2) clay; pockets of white (N 9) to dark-gray (N 3) massive trona in upper 0.1 ft. Halite 88 percent, trona 10 percent, clay 2 percent. |
| 96.7 | .5 | Trona and clay. White (N 9) to dark-gray (N 3) massive trona discolored by irregular streaks of grayish-black (N 2) clay; pockets of fibrous trona. Trona 98 percent, clay 2 percent. |
| 97.2 | .5 | Halite, burkeite, and clay. Friable aggregate of halite cubes modified by octahedron, averaging 5 mm in length, with 2 percent interstitial grayish-black (N 2) clay; very irregular seam, varying from 25 to 75 mm in width, of very pale orange (10YR 8/2) to grayish-yellow (5Y 8/4) dense massive burkeite at base. Halite 68 percent, burkeite 30 percent, clay 2 percent. |
| 97.6 | .4 | Halite, trona and clay. Well-consolidated aggregate of colorless halite cubes modified by octahedron, with interstitial fibrous trona mixed with grayish-black (N 2) clay; irregular pockets and seams of white (N 9) massive trona. Halite 88 percent, trona 10 percent, clay 2 percent. |
| 97.7 | .1 | Trona. White (N 9) hard massive trona. |
| 98.0 | .3 | Trona, halite, and clay. Fractured core. Fragments of white (N 9) massive trona associated with unconsolidated halite sand containing intermixed dark greenish-gray (5GY 4/1) clay. Trona 50 percent, halite 40 percent, clay 10 percent. |
| 100.0 | 2.0 | No core. |
| 100.6 | .6 | Halite. Well-consolidated aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 101.2 | 0.6 | Halite and burkeite. Well-consolidated slightly vuggy aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with irregular lenticular discontinuous seam of grayish-yellow (5Y 8/4) to very pale orange (10YR 7/2) hard massive burkeite and scattered 10- to 20-mm pockets of similar burkeite. Halite 85 percent, burkeite 15 percent. |
| 101.4 | .2 | Trona and halite. White (<i>N</i> 9) dense massive trona with 40 percent disseminated colorless halite crystals averaging 2 mm in length. |
| 102.0 | .6 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial white (<i>N</i> 9) massive and fibrous trona. |
| 102.4 | .4 | Burkeite. Fractured core. Fragments of grayish-yellow (5Y 8/4) dense hard massive burkeite. |
| 103.0 | .6 | Halite. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 103.1 | .1 | Halite, trona, and clay. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 20 percent white (<i>N</i> 9) to colorless massive and fibrous trona in irregular pockets; 5 percent interstitial dark greenish-gray (5GY 4/1) clay. |
| 104.8 | 1.7 | No core. |
| 105.7 | .9 | Halite, burkeite, clay, and sulfahalite. Friable aggregate of colorless subhedral halite cubes and cubes modified by octahedron, with irregular seam, 20 mm wide, of intermixed colorless halite and grayish-yellow (5Y 8/4) burkeite at 105.3 ft; thin seam, 5 mm wide, of black (<i>N</i> 1) clay with trace of intermixed colorless fibrous trona at base; single sulfahalite octahedron, 3 mm in diameter, intergrown with halite. Halite 96 percent, burkeite 3 percent, clay 1 percent. |
| 105.8 | .1 | Clay and trona. Black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with numerous very dusky red (10R 2/2) algae? discolorations in clay; with 50 percent disseminated trona blades averaging 5 mm in length. |
| 106.0 | .2 | Trona, burkeite, and clay. Wavy seams of white (<i>N</i> 9) to grayish-green (10GY 5/2) dense massive trona with thin irregular wavy seams, 1 mm wide, of greenish-black (5GY 2/1) trona discolored by trace of intermixed clay; pockets, 25 mm wide, of grayish-yellow (5Y 8/4) dense hard massive burkeite at base. Trona 97 percent, burkeite 2 percent, clay 1 percent. |
| 106.1 | .1 | Halite. Well-consolidated aggregate of colorless halite subhedra averaging 2 mm in length, with trace of interstitial colorless fibrous trona. |
| 106.3 | .2 | Trona. White (<i>N</i> 9) hard dense massive trona. |
| 106.4 | .1 | Burkeite. Irregular seam, averaging 0.1 ft in width, of grayish-orange (10YR 7/4) to very pale orange (10YR 8/2) dense hard massive burkeite. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 107. 0 | 0. 6 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with seams and streaks of white (N 9) massive trona. Halite 70 percent, trona 30 percent. |
| 107. 3 | . 3 | Clay. Grayish-black (N 2) to grayish-yellow (5Y 8/4) to dusky-red (5R 3/4) to very light gray (N 8) dense finely laminated clay. |
| 107. 9 | . 6 | Burkeite and clay. Very pale orange (10YR 8/2) dense hard massive vuggy burkeite with irregular pockets of moist tenacious black (N 1) clay. Burkeite 95 percent, clay 5 percent. |
| 109. 7 | 1. 8 | No core. |
| 110. 1 | . 4 | Clay. Black (N 1) to greenish-black (5GY 2/1) to moderate yellow-green (5GY 7/4) faintly finely laminated clay. |
| 110. 4 | . 3 | Clay and gaylussite. Greenish-black (5GY 2/1) clay with 50 percent disseminated clear colorless euhedral gaylussite crystals averaging 5 mm in length. |
| 111. 0 | . 6 | Clay and northupite*. Black (N 1) to greenish-black (5GY 2/1) to blackish-red (5R 2/2) to very light gray (N 8) dense faintly finely laminated clay with distinct laminae, 1-2 mm wide, of grayish-orange (10YR 7/4) massive northupite* containing minor intermixed gaylussite* at 110.7 and 110.8 ft. Clay 98 percent, northupite 2 percent. |
| 111. 1 | . 1 | Trona. Very coarse aggregate of colorless trona blades averaging 20 mm in length. |
| 111. 7 | . 6 | Trona and clay. White (N 9) to greenish-gray (5GY 6/1) massive trona with pockets, 10-50 mm wide, of colorless fibrous trona intermixed with 10 percent greenish-black (5GY 2/1) clay. Trona 98 percent, clay 2 percent. |
| 113. 4 | 1. 7 | No core. |
| 114. 9 | 1. 5 | Trona. Compact aggregate of colorless trona blades averaging 5 mm in length, with numerous ½-in. pockets of white (N 9) to dark greenish-gray (5GY 4/1) massive trona; 10 percent interstitial greenish-black (5GY 2/1) to dark greenish-gray (5GY 4/1) clay seams, from 114.6 to 114.7 ft, containing 50 percent intermixed grayish-orange (10YR 7/4) soft massive northupite. |
| 115. 2 | . 3 | Clay. Greenish-black (5GY 2/1) to black (N 1) to grayish-yellow (5Y 8/4) to very light gray (N 8) dense finely laminated clay. |
| 115. 5 | . 3 | Clay and gaylussite. Greenish-black (5GY 2/1) clay with 50 percent disseminated gaylussite crystals averaging 5 mm in length. |
| 115. 8 | . 3 | Clay and gaylussite. Greenish-black (5GY 2/1) to olive-gray (5Y 3/2) clay with 40 percent disseminated gaylussite sand. |
| 116. 4 | . 6 | Clay. Grayish-black (N 2) to greenish-black (5GY 2/1) to dusky yellow-green (5GY 3/2) to moderate olive-brown (5Y 4/4) to very light gray (N 8) dense finely laminated clay. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 116.7 | 0.3 | Trona* and clay. Very densely packed hard coarse aggregate of trona* blades averaging 40 mm in length, with 5 percent interstitial black (N 1) clay. |
| 116.8 | .1 | Trona. White (N 9) dense hard massive trona. |
| 117.7 | .9 | Trona, northupite, and clay. White (N 9) to light greenish-gray (5GY 8/1) massive trona with seams, 2-3 mm wide, of colorless fibrous trona and seams of similar width of dark greenish-gray (5GY 4/1) to olive-black (5Y 2/1) clay in lower 0.3 ft; seam, 5 mm wide, of grayish-orange (10YR 7/4) massive northupite at 117.4 ft. Trona 96 percent, clay 2 percent, northupite 2 percent. |
| 118.9 | 1.2 | Trona. Well-consolidated porous aggregate of colorless trona blades averaging 10 mm in length, with pockets and irregular streaks of white (N 9) massive trona; trace of interstitial greenish-gray (5GY 6/1) clay. |
| 119.5 | .6 | Trona and clay. Fractured core. Fragments of densely packed colorless trona blades with 5 percent interstitial greenish-black (5GY 2/1) clay; fragments of black (N 1) to greenish-black (5GY 2/1) clay. Trona 60 percent, clay 40 percent. |
| 120.8 | 1.3 | No core. |
| 120.9 | .1 | Clay. Black (N 1) to greenish-black (5GY 2/1) to brownish-black (5YR 2/1) to grayish-green (5G 5/2) to grayish-yellow (5Y 8/4) dense finely laminated clay. |
| 121.6 | .7 | Clay and gaylussite. Olive-gray (5Y 3/2) to grayish-green (10GY 5/2) clay with 40 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 121.7 | .1 | Clay. Grayish-green (10GY 5/2) to olive-gray (5Y 3/2) to grayish-yellow (5Y 8/4) to dusky yellow-green (5GY 5/2) finely laminated clay. |
| 122.7 | 1.0 | Clay and gaylussite. Olive-gray (3Y 3/2) to black (N 1) to greenish-black (5GY 2/1) to brownish-black (5YR 2/1) clay with 40 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 122.9 | .2 | Clay and gaylussite. Grayish-green (10GY 5/2) to olive-gray (5Y 3/2) to grayish-yellow (5Y 8/4) to dusky yellow-green (5GY 5/2) finely laminated clay with 10 percent disseminated gaylussite crystals averaging 15 mm in length. |
| 123.7 | .8 | Clay and gaylussite. Olive-gray (5Y 3/2) to greenish-gray (5G 6/1) to grayish-black (N 2) clay with 30 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 124.8 | 1.1 | Clay. Dark yellowish-orange (10YR 6/6) to light bluish-gray (5B 7/1) to dark greenish-gray (5GY 4/1) to dusky yellow-green (5GY 5/2) to grayish-yellow (5Y 8/4) to grayish-black (N 2) to very light gray (N 8) finely laminated clay. |

Searles drill hole GS-12

LOCATION: Searles Lake, Calif., at 1/4 sec. marker for secs. 2 and 3, R. 43 E., T. 26 S., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,618 ft.

ELEVATION AT BOTTOM OF HOLE: 1,491.4 ft.

TOTAL DEPTH: 126.6 ft.

DATES DRILLED: Jan. 14 to Feb. 2, 1955.

CASING USED: 26.0 ft of 16-in. casing; 87.7 ft of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 8.5 | 8.5 | Clay. Overburden mud, not cored. Moderate yellowish-brown (10YR 5/4) clay. |
| 15.0 | 6.5 | Clay. Overburden mud, not cored. Dusky yellow-green (5GY 5/2) clay. |
| 24.5 | 9.5 | Clay. Overburden mud, not cored. Black (N 1) clay. |
| 25.5 | 1.0 | Clay and pirssonite*. Black (N 1) dense clay with irregular pockets and streaks of dusky yellow-green (5GY 5/2) clay; numerous seams of disseminated euhedral pirssonite* crystals averaging 3 mm in length. Clay 95 percent, pirssonite 5 percent. |
| 26.0 | .5 | Clay and pirssonite. Black (N 1) clay with 50 percent disseminated euhedral pirssonite* crystals averaging 5 mm in length. |
| 26.3 | .3 | Clay and pirssonite*. Black (N 1) clay with 35 percent disseminated subhedral pirssonite* crystals averaging 3 mm in length. |
| 26.9 | .3 | Clay and pirssonite. Black (N 1) clay with 10 percent disseminated fine pirssonite sand. |
| 27.5 | .6 | Halite and clay. Moderately well consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 5 mm in length, with 10 percent interstitial black (N 1) to dusky yellow-green (5GY 5/2) clay. |
| 29.1 | 1.6 | No core. |
| 29.7 | .6 | Clay and pirssonite. Black (N 1) clay with 50 percent disseminated subhedral to anhedral pirssonite crystals averaging 10 mm in length. |
| 30.3 | .6 | Clay and pirssonite. Black (N. 1) clay with 50 percent disseminated pirssonite sand. |
| 30.6 | .3 | Halite, clay, and pirssonite. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with interstitial black (N 1) clay containing 50 percent disseminated pirssonite sand. Halite 70 percent, clay 15 percent, pirssonite 15 percent. |
| 31.2 | .6 | Halite and clay. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, up to 20 mm in length, averaging 3 mm, with 5 percent interstitial black (N 1) to dusky yellow-green (5GY 5/2) clay. |
| 31.3 | .1 | Clay and pirssonite*. Black (N 1) clay with 50 percent disseminated pirssonite* sand. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 31.6 | 0.3 | Halite and clay. Fractured core. Fragments consisting of aggregates of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent interstitial black (N 1) clay. |
| 32.0 | .4 | Halite and clay. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial black (N 1) clay. |
| 32.1 | .1 | Halite. Unconsolidated aggregate of subhedral to anhedral halite crystals averaging 30 mm in length. |
| 33.3 | 1.2 | No core. |
| 33.8 | .5 | Halite and trona. Well-consolidated vuggy aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 30 percent interstitial white (N 9) to colorless massive and fibrous trona. |
| 33.9 | .1 | Halite. Colorless halite anhedral averaging 30 mm in length. |
| 34.0 | .1 | Halite and trona. Well-consolidated aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 15 percent interstitial colorless to grayish-yellow (5Y 8/4) fibrous trona. |
| 35.1 | 1.1 | Halite. Well-consolidated aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, with a few irregular thin seams of interstitial black (N 1) clay. |
| 35.8 | .7 | Halite and trona. Well-consolidated vuggy aggregate of halite cubes and cubes modified by octahedron, with 25 percent interstitial white (N 9) to dark greenish-gray (5GY 4/1) massive trona. |
| 36.1 | .3 | Trona and halite. Well-consolidated dense aggregate of white (N 9) hard massive trona with 50 percent disseminated halite cubes averaging 3 mm in length. |
| 36.4 | .3 | Halite and clay. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent interstitial black (N 1) clay. |
| 36.7 | .3 | Halite and trona. Well-consolidated slightly vuggy aggregate of halite cubes with 30 percent interstitial white (N 9) hard massive trona. |
| 37.3 | .6 | Halite and trona. Fractured core. Unconsolidated halite sand and halite cubes 5-10 mm in length; fragments, several inches in length, consisting of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial white (N 9) massive trona. |
| 38.8 | 1.5 | No core. |
| 39.0 | .2 | Trona. White (N 9) to very pale orange (10YR 8/2) dense hard massive trona. |
| 39.5 | .5 | Trona and halite. White (N 9) to greenish-gray (5GY 6/1) to very pale orange (10YR 8/2) dense hard massive trona with seams, 10-30 mm in width, of coarse glassy anhedral halite. Trona 65 percent, halite 35 percent. |
| 40.3 | .8 | Halite and trona. Dense granular aggregate of colorless halite crystals averaging 3 mm in length, with 10 percent interstitial white (N 9) to very pale orange (10YR 8/2) to greenish-gray (5GY 6/1) hard massive trona. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 41. 4 | 1. 1 | Halite and trona. Well-consolidated vuggy aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) to greenish-black (5GY 2/1) massive trona in irregular pockets and seams and in interstices of halite crystals; trona locally discolored by trace of intermixed clay. Halite 85 percent, trona 15 percent. |
| 41. 6 | . 2 | Trona and halite. White (<i>N</i> 9) to very pale orange (10YR 8/2) dense hard slightly vuggy massive trona with 25 percent disseminated halite cubes averaging 3 mm in length. |
| 41. 7 | . 1 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) massive trona in irregular pockets and in interstices of halite. |
| 42. 0 | . 3 | Halite and trona. Densely packed very slightly vuggy granular aggregate of halite crystals with 30 percent interstitial white (<i>N</i> 9) hard massive trona. |
| 42. 9 | . 9 | Halite and trona. Well-consolidated slightly vuggy aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 40 percent interstitial white (<i>N</i> 9) to greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) massive trona. |
| 43. 3 | . 4 | Clay, pirssonite, and trona. Black (<i>N</i> 1) clay with 40 percent disseminated euhedral to subhedral pirssonite sand; 10 percent disseminated flat rounded fragments of white (<i>N</i> 9) bony massive trona. |
| 43. 4 | . 1 | Trona and halite. White (<i>N</i> 9) dense hard massive trona with 50 percent disseminated colorless halite crystals. |
| 45. 4 | 2. 0 | No core. |
| 46. 1 | . 7 | Halite and trona. Well-consolidated densely packed granular aggregate of halite crystals with 30 percent interstitial white (<i>N</i> 9) massive trona; numerous horizontal lenticular vugs 2-3 mm wide and 20-50 mm long. |
| 46. 3 | . 2 | Clay, pirssonite, and hanksite. Black (<i>N</i> 1) clay with 25 percent disseminated fine pirssonite sand; scattered loose singly terminated euhedral hanksite crystals, 10-40 mm long, containing black clay inclusions. Clay 70 percent, pirssonite 25 percent, hanksite 5 percent. |
| 46. 9 | . 6 | Halite and trona. Well-consolidated slightly vuggy aggregate of halite cubes averaging 3 mm in length, with 20 percent interstitial white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) massive trona; trace of interstitial black (<i>N</i> 1) clay. |
| 47. 6 | . 7 | Halite and trona. Dense granular slightly vuggy aggregate of colorless halite cubes averaging 3 mm in length, with 40 percent interstitial white (<i>N</i> 9) hard massive trona. |
| 48. 8 | 1. 2 | No core. |
| 49. 0 | . 2 | Halite and trona. Well-consolidated dense aggregate of colorless halite cubes averaging 3 mm in length, with 10 percent interstitial white (<i>N</i> 9) massive trona; seam, 10 mm wide, of white (<i>N</i> 9) soft massive trona at top. Halite 73 percent, trona 27 percent. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 49.5 | 0.5 | Trona and halite. White (N 9) to greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) to greenish-black (5GY 2/1) soft vuggy massive trona with grayish-yellow (5Y 8/4) to colorless fibrous trona lining vugs; scattered pockets and disseminated cubes and cubes modified by octahedron of colorless halite averaging 3 mm in length. Trona 85 percent, halite 15 percent. |
| 49.6 | .1 | Halite and trona. Well-consolidated aggregate of colorless halite cubes averaging 3 mm in length, with 10 percent interstitial grayish-yellow (5Y 8/4) to colorless fibrous trona. |
| 49.8 | .2 | Halite and trona. Densely packed granular aggregate of halite crystals with 10 percent interstitial white (N 9) massive trona. |
| 50.1 | .3 | Halite and trona. Well-consolidated vuggy aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 10 percent greenish-gray (5GY 6/1) to dark greenish-gray (5G 4/1) massive trona in irregular seams and in interstices of halite. |
| 50.7 | .6 | Halite. Well-consolidated moderately friable aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length, with trace of interstitial grayish-yellow (5Y 8/4) to colorless fibrous trona. |
| 51.2 | .5 | Halite, trona, and clay. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 15 percent interstitial greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) massive trona; seams of intermixed black (N 1) clay. Halite 75 percent, trona 15 percent, clay 10 percent. |
| 52.2 | 1.0 | Trona and halite. Well-consolidated vuggy thin alternating seams, 1-4 mm wide, of white (N 9) massive trona, with seams of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length; horizontal vugs 1-3 mm wide and up to 50 mm long. Trona 60 percent, halite 40 percent. |
| 52.6 | .4 | Halite. Fractured core. Fragments consisting of well-consolidated aggregates of colorless halite cubes averaging 3 mm in length. |
| 53.3 | .7 | No core. |
| 54.0 | .7 | Trona and halite. Well-consolidated vuggy white (N 9) to greenish-gray (5GY 6/1) massive trona with 50 percent disseminated colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length; trace of black (N 1) clay in lower 0.1 ft. |
| 54.1 | .1 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length, with 5 percent interstitial white (N 9) to greenish-gray (5GY 6/1) massive trona. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 55.5 | 1.4 | Trona and halite. Well consolidated vuggy alternating seams, 1-10 mm wide, of white (N 9) to grayish-yellow (5Y 8/4) massive trona with vuggy seams lined with colorless halite cubes and cubes modified by octahedron, up to 10 mm in length, averaging 2 mm. Trona 75 percent, halite 25 percent. |
| 56.1 | .6 | Halite and trona. Fractured core. Fragments consisting of well-consolidated aggregates of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial white (N 9) to greenish-gray (5GY 6/1) massive trona. |
| 56.5 | .4 | No core. |
| 57.1 | .6 | Trona and halite. White (N 9) to light greenish-gray (5GY 8/1) soft vuggy massive trona with colorless halite cubes and octahedra, averaging 3 mm in length, in irregular streaks, as disseminated crystals, and lining vugs. Core fractured in lower 0.3 ft. Trona 60 percent, halite 40 percent. |
| 57.8 | .7 | Halite and trona. Poorly consolidated friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent interstitial white (N 9) to light greenish-gray (5GY 8/1) massive trona. |
| 58.0 | .2 | Trona and halite. Moderately friable white (N 9) massive trona with 20 percent disseminated halite cubes averaging 3 mm in length. |
| 58.3 | .3 | Halite and trona. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 4 mm in length; 5 percent interstitial white (N 9) massive and colorless fibrous trona. |
| 60.7 | 2.4 | No core. |
| 61.0 | .3 | Halite and trona. Poorly consolidated colorless halite sand with 10 percent interstitial white (N 9) soft massive trona. Probably cuttings, not core. |
| 61.2 | .2 | Trona. Well-consolidated white (N 9) soft massive trona. |
| 61.5 | .3 | Halite. Core fractured. Friable aggregate of colorless halite cubes averaging 2 mm in length. |
| 61.9 | .4 | Halite and trona. Poorly consolidated mixture of colorless halite cubes averaging 3 mm in length, with 10 percent interstitial white (N 9) to light greenish-gray (5GY 8/1) soft massive trona. |
| 62.9 | 1.0 | No core. |
| 63.9 | 1.0 | Trona, halite, and hanksite. Poorly consolidated white (N 9) soft massive trona with intermixed halite sand; fragments of colorless to smoky granular massive hanksite at base. Probably cuttings not core. Trona 65 percent, halite 25 percent, hanksite 10 percent. |
| 65.1 | 1.2 | Hanksite. Densely packed granular slightly vuggy aggregate of dark smoky hanksite crystals with euhedral hanksite crystals, 5-15 mm in length, lining vugs; trace of greenish-black (5GY 2/1) clay and colorless to grayish-yellow (5Y 8/4) fibrous trona in scattered vugs. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 68.0 | 2.9 | No core. |
| 68.5 | .5 | Hanksite, trona, and sulfohalite. Densely packed granular vuggy aggregate of colorless to dark smoky hanksite crystals with euhedral to subhedral hanksite crystals, up to 50 mm in length, in vugs; 1- to 2-in. pockets of white (N 9) to light greenish-gray (5GY 8/1) massive trona and ½- to 1-in. pockets of colorless to grayish-yellow (5Y 8/4) fibrous trona; single sulfohalite octahedron, 6 mm in diameter, in 1 vug. Hanksite 95 percent, trona 5 percent. |
| 69.4 | .9 | Hanksite and trona. Densely packed granular vuggy aggregate of colorless to dark smoky hanksite crystals with 25 percent white (N 9) to dark greenish-gray (5GY 4/1) massive trona in irregular streaks 1-10 mm wide. |
| 69.7 | .3 | Trona and halite. Compact aggregate of colorless to grayish-yellow (5Y 8/4) fibrous trona with 10 percent disseminated halite cubes averaging 3 mm in length; numerous interstitial streaks and pockets of greenish-gray (5GY 6/1) to white (N 9) massive trona. |
| 70.0 | .3 | Hanksite. Dense granular massive smoky hanksite. |
| 70.3 | .3 | Halite and trona. Well-consolidated aggregate of halite cubes averaging 3 mm in length, with 40 percent interstitial greenish-gray (5GY 6/1) to white (N 9) massive trona. |
| 70.8 | .5 | Trona. White (N 9) soft massive trona. |
| 74.2 | 3.4 | No core. |
| 75.7 | 1.5 | Trona. White (N 9) soft massive trona. |
| 75.9 | .2 | Trona. White (N 9) to dusky yellow-green (5GY 5/2) soft massive trona. |
| 76.1 | .2 | Trona and hanksite. White (N 9) soft massive vuggy trona with pockets and lenticular streaks of granular massive smoky to colorless hanksite; ½-in. vugs lined with grayish-yellow (5Y 8/4) fine fibrous trona; a few subhedral borax crystals 10 mm long and vugs containing fine fibrous trona scattered along base. Trona 70 percent, hanksite 30 percent. |
| 76.3 | .2 | Borax. Vuggy aggregate of colorless euhedral borax crystals averaging 10 mm in length with trace of interstitial grayish-yellow (5Y 8/4) to grayish-black (N 2) clay. |
| 76.6 | .3 | Clay. Dark greenish-gray (5G 4/1) to dusky yellow-green (5GY 5/2) to olive-gray (5Y 3/2) to dark yellowish-orange (10YR 6/6) faintly finely laminated clay with a few thin lamina of anhedral gaylussite averaging 1 mm thick. |
| 77.1 | .5 | Clay and gaylussite*. Black (N 1) to dark greenish-gray (5G 4/1) to greenish-black (5GY 2/1) to dusky yellow-green (5GY 5/2) very faintly finely laminated clay with 25 percent disseminated anhedral gaylussite* crystals averaging 10 mm in length, locally in radiating clusters. |
| 77.4 | .3 | Clay and gaylussite. Greenish-black (5GY 2/1 and 5G 2/1) to grayish-black (N 2) to dark-gray (N 3) to grayish yellow-green (5GY 7/2) to brownish-black (5YR 2/1) faintly finely laminated clay with 20 percent disseminated gaylussite crystals averaging 10 mm in length. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 77.7 | 0.3 | Clay. Grayish-black (<i>N</i> 2) to dark greenish-gray (<i>5G</i> 4/1) to greenish-gray (<i>5G</i> 6/1) to yellowish-gray (<i>5Y</i> 8/1) dense finely laminated clay with a few seams, 1 mm wide, of anhedral gaylussite and scattered disseminated gaylussite crystals. |
| 78.0 | .3 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to brownish-black (<i>5YR</i> 2/1) to greenish-black (<i>5G</i> 2/1) clay with 35 percent disseminated anhedral gaylussite crystals averaging 15 mm in length, seams of anhedral gaylussite, and local radiating clusters of anhedral gaylussite crystals up to 50 mm in length. |
| 80.0 | 2.0 | Clay and aragonite*. Black (<i>N</i> 1) to yellowish-gray (<i>5Y</i> 7/2) to greenish-gray (<i>5GY</i> 6/1) coarsely laminated clay with widely spaced laminae, averaging 1 mm wide, of grayish yellow-green (<i>5GY</i> 7/2) to light greenish-gray (<i>5GY</i> 8/1) soft massive finely crystalline aragonite*. |
| 82.1 | 2.1 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1) to grayish-yellow (<i>5Y</i> 8/4) to dark greenish-gray (<i>5GY</i> 4/1 and <i>5G</i> 4/1) to greenish-gray (<i>5GY</i> 6/1) to very light gray (<i>N</i> 8) dense finely laminated clay, with scattered 1- to 2-in. pockets of anhedral gaylussite crystals; laminae coarser in lower 0.5 feet. Clay 99 percent, gaylussite 1 percent. |
| 82.8 | .7 | No core. |
| 82.9 | .1 | Clay and gaylussite. Black (<i>N</i> 1) to brownish-black (<i>5YR</i> 2/1) to very light gray (<i>N</i> 8) to grayish-yellow (<i>5Y</i> 8/4) to moderate-yellow (<i>5Y</i> 7/6) clay with 50 percent disseminated anhedral gaylussite crystals. |
| 83.2 | .3 | Clay. Black (<i>N</i> 1) to brownish-black (<i>5YR</i> 2/1) to very light gray (<i>N</i> 8) to grayish-yellow (<i>5Y</i> 7/4) to moderate-yellow (<i>5Y</i> 7/6) coarsely laminated clay revealed by color differences. |
| 83.5 | .3 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1) to dusky yellow-green (<i>5GY</i> 5/2) to moderate-yellow (<i>5Y</i> 7/6) to very light gray (<i>N</i> 8) coarsely laminated clay revealed by color differences with 40 percent disseminated gaylussite crystals. |
| 83.9 | .4 | Clay. Grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1) to greenish-gray (<i>5G</i> 6/1) to dark greenish-gray (<i>5G</i> 4/1) to grayish olive-green (<i>5GY</i> 3/2) faintly finely laminated clay with faint irregular laminae, 1 mm or less in thickness. discolored moderate reddish-brown (<i>10R</i> 4/6) by algae(?). |
| 85.3 | 1.4 | Clay and gaylussite. Grayish black (<i>N</i> 2) to light-olive (<i>10Y</i> 5/4) to light-gray (<i>N</i> 7) coarsely laminated clay revealed by color differences, with 5 percent disseminated gaylussite in scattered pockets; distinct moderate reddish-brown (<i>10R</i> 4/6) algae(?) discolored seams at 83.9 and 84.2 ft. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 86.9 | 1.6 | Clay and gaylussite. Dusky yellow-green (5GY 3/2) to grayish olive-green (5GY 3/2) to grayish-black (N 2) to light-gray (N 7) coarsely laminated clay revealed by color differences, with 25 percent disseminated gaylussite crystals averaging 5 mm in length; distinct laminae discolored moderate reddish-brown (10R 4/6) by algae(?). |
| 87.4 | .5 | Borax and clay. Dense aggregate of anhedral to euhedral borax crystals averaging 15 mm in length, with trace of interstitial grayish-yellow (5Y 8/4) clay in upper 0.3 ft; 5 percent interstitial black (N 1) to grayish-black (N 2) clay in lower 0.2 ft. Borax 99 percent, clay 1 percent. |
| 87.6 | .2 | Trona, clay, and borax. Fractured core. Fragments consisting of vuggy aggregates of trona* blades averaging 15 mm in length, containing minor intergrown pirssonite* with 5 percent interstitial dark greenish-gray (5GY 4/1) to grayish-yellow (5Y 8/4) clay; 5 percent intermixed subhedral borax crystals averaging 5 mm in length. |
| 88.1 | .5 | No core. |
| 89.6 | 1.5 | Trona. White (N 9) to dark greenish-gray (5GY 4/1) soft massive to fine fibrous trona with scattered 1-in. streaks and spots discolored moderate reddish-brown (10R 4/6) by algae(?). |
| 89.8 | .2 | Halite and trona. Well-consolidated aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 1 percent interstitial white (N 9) to greenish-gray (5GY 6/1) massive trona. |
| 90.2 | .4 | Trona, pirssonite, and clay. Well-consolidated slightly vuggy aggregate of white (N 9) to colorless fibrous trona with pockets of white (N 9) to greenish-gray (5GY 6/1) massive trona; irregular wavy seam, 10 mm wide, of black (N 1) clay with 10 percent disseminated pirssonite crystals, averaging 2 mm in length, at 89.9 ft. Trona 92 percent, clay 7 percent, pirssonite 1 percent. |
| 90.5 | .3 | Trona and clay. White (N 9) dense hard massive vuggy trona with 1 percent black (N 1) greenish-black (5GY 2/1) clay in irregular streaks. |
| 90.9 | .4 | Clay and pirssonite. Black (N 1) to moderate olive-brown (5Y 4/4) clay with 35 percent disseminated euhedral pirssonite crystals averaging 2 mm in length. |
| 91.8 | .9 | No core. |
| 93.2 | 1.4 | Clay and pirssonite. Black (N 1) to moderate olive-brown (5Y 4/4) to medium light-gray (N 6) clay with 40 percent disseminated euhedral pirssonite crystals averaging 4 mm in length. |
| 93.8 | .6 | Trona. White (N 9) to colorless aggregate of fine fibrous trona with seam, 10 mm wide, of grayish-yellow (5Y 8/4) fibrous trona at top. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|--------------------------|-------------------------------------|---|
| 94.1 | 0.3 | Halite and trona. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 40 percent interstitial white (<i>N</i> 9) to greenish-gray (5GY 6/1) massive trona. |
| 94.9 | .8 | No core. |
| 95.6 | .7 | Halite and trona. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 30 percent interstitial white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) to grayish-yellow (5Y 8/4) massive trona. |
| 96.1 | .5 | Trona and halite. Well-consolidated white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) to light-brown (5YR 6/4) massive trona with 25 percent disseminated colorless halite cubes modified by octahedron, averaging 3 mm in length. |
| 96.4 | .3 | Trona. Fractured core. Fragments of well-consolidated white (<i>N</i> 9) to dark greenish-gray (5GY 4/1) massive vuggy trona. |
| 97.2 | .8 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with 20 percent white (<i>N</i> 9) to greenish gray (5GY 6/1) massive trona in interstices and pockets; moderate reddish-orange (10R 6/6) algae(?) discolorations, 1-3 mm wide, in massive trona at top. |
| 98.0 | .8 | Trona. Well-consolidated white (<i>N</i> 9) to greenish-gray (5GY 6/1) massive trona with dusky-red (5R 3/4) algae(?) discoloration, 10 mm wide, in trona at 97.5 ft; a few irregular seams, 1-2 mm wide, of black (<i>N</i> 1) clay; scattered pockets of colorless halite anhedra averaging 3 mm in length. |
| 100.2 | 2.2 | No core. |
| 101.6 | 1.4 | Clay and pirssonite. Black (<i>N</i> 1) to grayish olive-green (5GY 3/2) to dusky-yellow (5Y 6/4) to grayish-green (5G 5/2) to light olive-brown (5Y 5/6) clay with 40 percent disseminated euhedral pirssonite crystals averaging 5 mm in length. |
| 101.8 | .2 | Clay, pirssonite, and trona. Black (<i>N</i> 1) clay with 40 percent disseminated euhedral pirssonite crystals averaging 1 mm in length; 5 percent disseminated rounded nodules, up to 60 mm in length, averaging 20 mm, of grayish-yellow (5Y 8/4) hard dense massive trona*. |
| 101.9 | .1 | Halite. Well-consolidated aggregate of white (<i>N</i> 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 102.1 | .2 | Burkeite. Irregular vuggy seam, averaging 0.15 ft in width, of grayish-yellow (5Y 8/4) hard dense massive burkeite. |
| 102.3 | .2 | Trona. White (<i>N</i> 9) to yellowish-gray (5Y 8/1) dense massive trona. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 102.4 | 0.1 | Halite, trona, and clay. Well-consolidated aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, averaging 4 mm in length, with 1 percent interstitial grayish-black (N 2) clay and 1 percent interstitial white (N 9) massive trona. |
| 102.8 | .4 | Halite and trona. Well-consolidated aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with seam, 10 mm wide, of light greenish-gray (5GY 8/1) to greenish-gray (5GY 6/1) massive trona at 102.6 ft. Halite 92 percent, trona 8 percent. |
| 103.0 | .2 | Burkeite and halite. Irregular seam of grayish-yellow (5Y 8/4) dense hard massive vuggy burkeite with halite cubes modified by octahedron, averaging 5 mm in length in vugs. Burkeite 99 percent, halite 1 percent. |
| 103.1 | .1 | Halite. Well-consolidated aggregate of halite cubes modified by octahedron, averaging 4 mm in length. |
| 103.8 | .7 | Trona. Well-consolidated white (N 9) to medium-gray (N 5) to colorless massive to fibrous trona with a few disseminated halite crystals. |
| 103.9 | .1 | Halite and trona. Well-consolidated white (N 9) massive trona with pockets of halite cubes modified by octahedron, averaging 4 mm in length. Trona 50 percent, halite 50 percent. |
| 104.0 | .1 | Trona. White (N 9) to medium-gray (N 5) dense massive trona. |
| 104.6 | .6 | Trona, burkeite, and halite. White (N 9) to yellowish-gray (5Y 8/1) massive vuggy trona with irregular seams and pockets of pale yellowish-orange (10YR 8/6) to dark yellowish-orange (10YR 6/6) hard massive burkeite; scattered pockets of halite cubes modified by octahedron, averaging 5 mm in length. Trona 60 percent, burkeite 39 percent, halite 1 percent. |
| 104.7 | .1 | Trona and clay. White (N 9) soft massive trona with seam, 1 mm wide, of black (N 1) clay at base. Trona 97 percent, clay 3 percent. |
| 105.0 | .3 | Halite. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with trace of interstitial colorless fibrous trona. |
| 105.4 | .4 | Halite and trona. Poorly consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent interstitial white (N 9) to greenish-gray (5GY 6/1) massive trona. |
| 106.6 | 1.2 | No core. |
| 106.8 | .2 | Trona. White (N 9) to moderate orange-pink (5YR 8/4) massive trona with pockets of colorless fibrous trona. |
| 107.8 | 1.0 | Halite. Friable aggregate of white (N 9) to colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length; seam, 10 mm wide, of halite with 20 percent interstitial white (N 9) to greenish-gray (5GY 6/1) to colorless, massive, fibrous, and bladed trona containing 10 percent intermixed grayish-black (N 2) clay at 107.6 ft. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 108.0 | 0.2 | Halite and trona. Well-consolidated aggregate of colorless halite cubes with 25 percent interstitial colorless fibrous trona. |
| 108.3 | .3 | Trona, burkeite, and halite. White (<i>N</i> 9) to light greenish-gray (5GY 8/1) massive trona with pockets of colorless fibrous trona and pockets of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length; irregular vuggy lenticular pockets, averaging 3 in. in length, of moderate yellowish-brown (10YR 5/4) dense hard massive burkeite in lower 0.1 ft. Trona 75 percent, burkeite 20 percent, halite 5 percent. |
| 108.6 | .3 | Halite, burkeite, and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent interstitial colorless fibrous trona and irregular vuggy pockets of moderate yellowish-brown (10YR 5/4) dense hard massive burkeite at base. Halite 80 percent, burkeite 15 percent, trona 5 percent. |
| 109.3 | .7 | Halite, trona, burkeite. Well-consolidated vuggy aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent fibrous and bladed trona in interstices and in vugs; local moderate orange-pink (5YR 8/4) algae discolorations in 1-in. pockets with trona; scattered ½-in. pockets of grayish-orange (10YR 7/4) dense hard massive burkeite in upper 0.3 ft. Halite 94 percent, trona 5 percent, burkeite 1 percent. |
| 109.4 | .1 | Burkeite and halite. Fractured core. Fragments of grayish-orange (10YR 7/4) to pale-olive (10Y 6/2) dense hard vuggy massive burkeite with pockets of colorless halite cubes averaging 4 mm in length. Burkeite 60 percent, halite 40 percent. |
| 110.0 | .6 | No core. |
| 110.1 | .1 | Trona. White (<i>N</i> 9) to medium dark-gray (<i>N</i> 4) massive trona with a few disseminated colorless halite crystals. |
| 110.5 | .4 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron, averaging 2 mm in length, with seam, 20 mm wide, of white (<i>N</i> 9) to medium dark-gray (<i>N</i> 4) massive trona at top. Halite 78 percent, trona 22 percent. |
| 110.8 | .3 | Burkeite and trona. Grayish-orange (10YR 7/4) dense hard vuggy massive burkeite with seams, 15 mm wide, of white (<i>N</i> 9) massive trona at top and base. Burkeite 67 percent, trona 33 percent. |
| 111.0 | .2 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with pockets of colorless massive trona. Halite 90 percent, trona 10 percent. |
| 111.2 | .2 | Trona, burkeite and halite. White (<i>N</i> 9) to medium dark-gray (<i>N</i> 4) slightly vuggy massive trona with 10 percent disseminated halite crystals; seam, 10 mm wide, of pale yellowish-orange (10YR 8/6) massive burkeite at base. Trona 75 percent, burkeite 15 percent, halite 10 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 111.4 | 0.2 | Clay. Grayish-black (<i>N</i> 2) to dusky-red (<i>5R</i> 3/4) to very light-gray (<i>N</i> 8) finely laminated clay. |
| 111.5 | .1 | Clay, gaylussite, and borax. Greenish-black (<i>5GY</i> 2/1) clay with 30 percent disseminated fine gaylussite sand and 10 percent disseminated euhedral prismatic borax crystals averaging 20 mm in length. |
| 111.7 | .2 | Trona and clay. White (<i>N</i> 9) to yellowish-gray (<i>5Y</i> 7/2) to dark greenish-gray (<i>5GY</i> 4/1) seams of fine fibrous and massive trona with a few seams, 1-2 mm wide, of black (<i>N</i> 1) clay; moderate reddish-brown (<i>10R</i> 4/6) algae(?) discolorations in trona in upper 20 mm. Trona 99 percent, clay 1 percent. |
| 111.9 | .2 | Trona and burkeite. White (<i>N</i> 9) massive trona with lenticular pockets of grayish-orange (<i>10YR</i> 7/4) dense hard vuggy massive burkeite. Trona 75 percent, burkeite 25 percent. |
| 112.5 | .6 | Burkeite. Grayish-orange (<i>10YR</i> 7/4) hard vuggy massive burkeite; core fractured in lower 0.2 ft. |
| 112.9 | .4 | Clay and northupite. Grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1) to dusky yellow-green (<i>5GY</i> 5/2) to very light-gray (<i>N</i> 8) finely laminated clay with disseminated oval to round nodules, averaging 1 mm in length, of white (<i>N</i> 9) massive northupite arranged in layers. Clay 99 percent, northupite 1 percent. |
| 113.0 | .1 | Clay. Clay as described in preceding unit; no northupite. |
| 113.1 | .1 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1) clay with 25 percent disseminated euhedral gaylussite crystals averaging 2 mm in length; numerous seams, less than 1 mm wide, of moderate greenish-yellow (<i>10Y</i> 7/4) to grayish-yellow (<i>5Y</i> 8/4) gaylussite silt. Clay 85 percent, gaylussite 15 percent. |
| 113.4 | .3 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1) to light greenish-gray (<i>5GY</i> 8/1) locally faintly finely laminated clay with seams of disseminated colorless euhedral gaylussite crystals from 1 to 4 mm in length. Clay 60 percent, gaylussite 40 percent. |
| 113.6 | .2 | Clay and borax. Fractured core. Dusky yellow-green (<i>5GY</i> 5/2) to greenish-gray (<i>5GY</i> 6/1 and <i>5G</i> 6/1) to light bluish-gray (<i>5B</i> 7/1) faintly finely laminated clay with seam, 20 mm wide, of massive borax; scattered nodules, averaging 5 mm in diameter, of white (<i>N</i> 9) massive northupite. Clay 70 percent, borax 30 percent. |
| 114.3 | .7 | No core. |
| 114.6 | .3 | Clay. Black (<i>N</i> 1) to grayish-yellow (<i>5Y</i> 8/4) to medium-gray (<i>N</i> 5) finely laminated clay. |
| 114.8 | .2 | Trona, northupite, and clay. Colorless to smoky dense hard granular trona; seam, 10 mm wide, at top, containing trona blades averaging 5 mm in length, with 75 percent interstitial black (<i>N</i> 1) clay; seam, 15 mm wide, at base of black (<i>N</i> 1) clay with 10 percent disseminated trona needles and distinct seams of grayish-orange (<i>10YR</i> 7/4) northupite. Trona 75 percent, northupite 15 percent, clay 10 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 115.0 | 0.2 | Clay. Medium bluish-gray (5B 5/1) to dark greenish-gray (5GY 4/1) to dark-gray (N 3) finely laminated clay with wavy laminae and a few fine laminae of moderate reddish-brown (10R 4/6) algae(?)-discolored clay; scattered nodules, 15 mm long, of very pale orange (10YR 8/2) massive northupite. |
| 115.1 | .1 | Trona. Coarse vuggy bladed trona, blades averaging 20 mm in length. |
| 115.3 | .2 | Trona. Fractured core. Fragments of coarse bladed trona, blades averaging 10 mm in length. |
| 115.6 | .3 | Clay and northupite. Grayish-black (N 2) to greenish-black (5GY 2/1) to dusky yellow-green (5GY 5/2) to pale-olive (10Y 6/2) finely laminated clay with disseminated oval to round white (N 9) massive northupite nodules, averaging 1 mm in diameter, arranged in layers in lower 0.1 ft. Clay 95 percent, northupite 5 percent. |
| 115.7 | .1 | Clay and gaylussite. Greenish-black (5GY 2/1) clay with 50 percent disseminated gaylussite silt. |
| 116.0 | .3 | Clay. Finely laminated clay as in previous interval. |
| 116.9 | .9 | Trona and clay. White (N 9) to medium-gray (N 5) compact massive trona with numerous pockets of colorless to light greenish-gray (5GY 8/1) fibrous and bladed trona, blades averaging 5 mm in length; 5 percent intermixed grayish-black (N 2) clay in interstices of trona blades in lower 0.2 ft. |
| 117.1 | .2 | Clay, northupite, and sulfahalite*. Grayish-black (N 2) to dark-gray (N 3) to dusky yellow-green (5GY 5/2) faintly finely laminated clay with disseminated oval to circular nodules, averaging less than 1 mm in diameter, of white (N 9) massive northupite arranged in layers; scattered amber-colored anhedral to subhedral sulfahalite* crystals averaging 5 mm in diameter. Clay 95 percent, northupite 5 percent. |
| 117.5 | .4 | Clay and gaylussite*. Grayish-black (N 2) to medium dark-gray (N 4) to grayish-yellow (5Y 8/4) to very light gray (N 8) finely laminated clay with 25 percent disseminated gaylussite* silt. |
| 118.0 | .5 | Clay and gaylussite. Grayish-black (N 2) to grayish-yellow (5Y 8/4) clay with 50 percent disseminated gaylussite crystals averaging 15 mm in length. |
| 119.3 | 1.3 | No core. |
| 119.6 | .3 | Clay and gaylussite. Moderate yellowish-brown (10YR 5/4) to grayish-black (N 2) clay with 40 percent disseminated euhedral gaylussite crystals averaging 10 mm in length; a few seams, 1 mm wide, of fine gaylussite silt. |
| 120.0 | .4 | Clay and gaylussite. Grayish-black (N 2) to greenish-black (5GY 2/1) to moderate yellowish-brown (10YR 5/4) clay with 40 percent disseminated euhedral clear gaylussite crystals averaging 1 mm in length. |
| 120.4 | .4 | Clay. Grayish-black (N 2) to grayish-yellow (5Y 8/4) to dusky yellow-green (5GY 5/2) to very light gray (N 8) finely laminated clay. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 120. 6 | 0. 2 | Clay and gaylussite. Grayish-black (<i>N</i> 2) clay with 50 percent disseminated gaylussite silt. |
| 120. 8 | . 2 | Trona and clay. Aggregate of coarse trona blades averaging 20 mm in length, with 5 percent interstitial grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1) clay. |
| 121. 5 | . 7 | Trona and northupite. White (<i>N</i> 9) to light greenish-gray (<i>5GY</i> 8/1) to medium-gray (<i>N</i> 5) porous massive trona with seams, 10 mm wide, of colorless fibrous trona at 121.2 and 121.5 ft; seam, 15 mm wide, of massive trona discolored very pale orange (<i>10YR</i> 8/2) to grayish-orange (<i>10YR</i> 7/4) by 30 percent interstitial massive northupite at 121.4 ft. Trona 98 percent, northupite 2 percent. |
| 121. 9 | . 4 | Trona. Well-consolidated aggregate of coarse colorless trona blades averaging 10 mm in length, with numerous 1/2-in. pockets and irregular streaks of white (<i>N</i> 9) to colorless massive trona; trace of interstitial greenish-gray (<i>5GY</i> 6/1) clay. |
| 122. 0 | . 1 | Trona and clay. Grayish-black (<i>N</i> 2) to yellowish-gray (<i>5Y</i> 8/1) clay with 50 percent disseminated trona blades averaging 10 mm in length. |
| 123. 5 | 1. 5 | No core. |
| 123. 7 | . 2 | Clay. Grayish-black (<i>N</i> 2) to brownish-black (<i>5YR</i> 2/1) to grayish-yellow (<i>5Y</i> 8/4) to medium bluish-gray (<i>5B</i> 7/1) to very light gray (<i>N</i> 8) finely laminated clay. |
| 126. 6 | 2. 9 | Clay and gaylussite. Dark greenish-gray (<i>5GY</i> 4/1) to moderate olive-brown (<i>5Y</i> 4/4) to dusky yellow-green (<i>5GY</i> 5/2) to grayish-black (<i>N</i> 2) clay, locally finely laminated, with 45 percent disseminated euhedral gaylussite crystals averaging 10 mm in length. |

Searles drill hole GS-14

LOCATION: Searles Lake, Calif., at common cor., secs. 25, 26, 35, and 36, R. 43 E., T. 25 S., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,616 ft.

ELEVATION AT BOTTOM OF HOLE: 1,490.6 ft.

TOTAL DEPTH: 125.4 ft.

DATES DRILLED: Feb. 3-18, 1955.

CASING USED: 85.5 ft of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 0. 8 | 0. 8 | Halite and clay. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 10 mm in length, with 5 percent interstitial pale-olive (<i>10Y</i> 6/2) to dusky-yellow (<i>5Y</i> 6/4) clay. |
| 1. 7 | . 9 | Halite and clay. Poorly consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 10 mm in length, with 5 percent interstitial dusky yellow-green (<i>5GY</i> 5/2) to pale-olive (<i>10Y</i> 6/2) clay. |
| 2. 1 | . 4 | No core. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 2.4 | 0.3 | Halite and clay. Friable aggregate of halite cubes and cubes modified by octahedron, averaging 10 mm in length, with 5 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 3.2 | .8 | Halite and clay. Poorly consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 10 mm in length, with 5 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 4.0 | .8 | Clay and halite. Well-consolidated dusky yellow-green (5GY 5/2) clay with 50 percent disseminated colorless halite cubes modified by octahedron, averaging 10 mm in length. |
| 4.3 | .3 | No core. |
| 6.0 | 1.7 | Clay, hanksite*, and halite. Dusky yellow-green (5GY 5/2) to dark greenish-gray (5GY 4/1) soft moist clay with 10 percent disseminated halite cubes modified by octahedron, averaging 10 mm in length; 60 percent disseminated subhedral to euhedral hanksite* crystals up to 80 mm in length, averaging 60 mm, in lower 0.8 ft. Clay 60 percent, hanksite 30 percent, halite 10 percent. |
| 7.9 | 1.9 | Halite. Poorly consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 5 mm in length, with trace of interstitial dusky yellow-green (5GY 5/2) clay. |
| 9.2 | 1.3 | Clay and halite. Grayish-green (10GY 5/2) clay with 25 percent disseminated colorless halite cubes modified by octahedron and anhedral, averaging 10 mm in length. |
| 10.3 | 1.1 | Halite and clay. Poorly consolidated aggregate of colorless halite cubes modified by octahedron, averaging 5 mm in length, with 2 percent interstitial grayish-green (10GY 5/2) clay. |
| 10.6 | .3 | Halite and clay. Fractured core. Vuggy granular aggregate of halite with 10 percent interstitial greenish-gray (10GY 5/2) clay. |
| 11.0 | .4 | Halite and clay. Well-consolidated aggregate of halite anhedral with 10 percent interstitial grayish-green (10GY 5/2) to grayish-black (N 2) clay. |
| 13.7 | 2.7 | No core. |
| 14.0 | .3 | Halite and clay. Fractured core. Fragments of anhedral to subhedral halite crystal aggregates with 2 percent interstitial grayish-green (10GY 5/2) to dark greenish-gray (5GY 4/1) clay. |
| 14.6 | .6 | Clay and halite. Well-consolidated grayish-green (10GY 5/2) to greenish-black (5GY 2/1) clay with 40 percent disseminated colorless halite cubes modified by octahedron, averaging 3 mm in length. |
| 14.9 | .3 | Halite. Poorly consolidated mixture of halite sand and disseminated halite anhedral and subhedral averaging 10 mm in length; trace of dusky yellow-green (5GY 5/2) clay. Probably cuttings, not core. |
| 15.8 | .9 | No core. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 17.3 | 1.5 | Halite and clay. Poorly consolidated aggregate of colorless halite cubes averaging 2 mm in length, with trace of dusky yellow-green (5GY 5/2) clay; large fragments, 4-5 in. long, consisting of aggregates of colorless halite cubes modified by octahedron with 2 percent interstitial dusky yellow-green (5GY 5/2) to grayish-green (10GY 5/2) clay. |
| 18.1 | .8 | No core. |
| 18.6 | .5 | Halite and clay. Well-consolidated aggregate of halite cubes modified by octahedron, anhedra, and subhedra, averaging 10 mm in length, with 15 percent interstitial grayish-green (10GY 5/2) to dusky-green (5G 3/2) clay. |
| 19.2 | .6 | Hanksite, clay, and halite. Poorly consolidated mixture of yellowish euhedral to subhedral hanksite crystals up to 80 mm in length, averaging 20 mm, and colorless halite cubes modified by octahedron and anhedra, averaging 15 mm in length, with 20 percent interstitial grayish olive-green (5GY 3/2) clay. Hanksite, 70 percent, clay 20 percent, halite 10 percent. |
| 20.0 | .8 | Halite and hanksite. Poorly consolidated aggregate of colorless to white (N 9) halite cubes averaging 2 mm in length, with a few colorless euhedral hanksite crystals 2 mm long. |
| 20.2 | .2 | No core. |
| 21.2 | 1.0 | Halite and hanksite. Unconsolidated aggregate of colorless halite sand, discolored dusky yellow-green (5GY 5/2) by trace of clay, with disseminated fragments of dense granular massive yellowish hanksite and large subhedral hanksite crystals. Probably cuttings, not core. Halite 80 percent, hanksite 20 percent. |
| 21.7 | .5 | Halite, hanksite, and clay. Core fractured. Well-consolidated vuggy aggregate of halite cubes modified by octahedron, averaging 5 mm in length, with 10 percent disseminated subhedral yellowish smoky hanksite crystals averaging 20 mm in length; 10 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 21.9 | .2 | Hanksite. Unconsolidated loose crystals of yellowish subhedral to euhedral hanksite averaging 25 mm in length, with a few dark yellowish-orange (10YR 6/6) hanksite crystals. |
| 22.2 | .3 | Halite* and trona*. Dense granular aggregate of grayish-orange (10YR 7/4) intermixed halite* and trona* with large pocket of colorless halite cubes modified by octahedron, averaging 5 mm in length. Halite 75 percent, trona 25 percent. |
| 25.3 | 3.1 | No core. |
| 25.5 | .2 | Halite. Unconsolidated halite sand discolored dusky yellow-green (5GY 5/2) by trace of interstitial clay. Probably cuttings, not core. |
| 25.8 | .3 | Hanksite. Unconsolidated loose crystals of euhedral to anhedral smoky hanksite with numerous dark yellowish-orange (10YR 6/6) algae(?) inclusions. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 26. 2 | 0. 4 | Halite. Well-consolidated aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length. |
| 26. 4 | . 2 | Halite, borax, and trona. Fractured core. Fragments consisting of aggregates of halite cubes modified by octahedron, averaging 3 mm in length; single large subhedral borax crystal, 3 in. long, with surficial fibrous trona at base of crystal; loose disseminated borax crystals averaging 20 mm in length throughout. Halite 80 percent, borax 20 percent. |
| 26. 9 | . 5 | Halite and clay. Well-consolidated aggregate of colorless halite anhedral and cubes modified by octahedron, averaging 3 mm in length, with 2 percent interstitial dusky yellow-green (5GY 5/2) to grayish-green (10GY 5/2) clay. |
| 27. 1 | . 2 | Trona* and borax. Unconsolidated loose irregular vuggy fragments of very pale orange (10YR 8/2) massive to fibrous trona* with disseminated subhedral colorless borax crystals averaging 20 mm in length; loose subhedral borax crystals up to 60 mm in length. Trona 90 percent, borax 10 percent. |
| 27. 5 | . 4 | Hanksite, borax, trona, and halite. Well-consolidated vuggy irregular seams of very pale orange (10YR 8/2) massive trona with irregular seams of tabular colorless borax crystals, averaging 20 mm in length, between trona seams; very pale orange (10YR 8/2) euhedral hanksite crystals, averaging 20 mm in length, disseminated throughout or collected in irregular seams; irregular seam of colorless halite cubes and anhedral, averaging 2 mm in length, at base. Hanksite 40 percent, borax 25 percent, trona 25 percent, halite 10 percent. |
| 27. 6 | . 1 | Halite and trona. Well-consolidated aggregate of halite cubes and cubes modified by octahedron, averaging 2 mm in length, with 5 percent interstitial pale-olive (10Y 5/2) massive trona. |
| 28. 2 | . 6 | Halite and trona. Dense granular aggregate of grayish-orange (10YR 7/4) to very pale orange (10YR 8/2) intermixed halite and trona; scattered subhedral borax crystals, 25 mm in length, at top. Halite 50 percent, trona 50 percent. |
| 28. 3 | . 1 | Halite and clay. Well-consolidated aggregate of halite cubes, averaging 3 mm in length, with 5 percent interstitial dusky yellow-green (5GY 5/2). |
| 29. 3 | 1. 0 | No core. |
| 29. 6 | . 3 | Hanksite, halite, and clay. Well-consolidated aggregate of large subhedral or rounded smoky hanksite crystals up to 90 mm in length, averaging 45 mm, with 5 percent interstitial dusky yellow-green (5GY 5/2) to grayish yellow-green (5GY 3/2) clay containing 50 percent disseminated colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length; a few pockets of white (N 9) to colorless trona blades averaging 5 mm in length. Hanksite 95 percent, clay 3 percent, halite 2 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 30.1 | 0.5 | Trona and borax. Well-consolidated slightly vuggy very pale orange (10YR 8/2) to grayish-orange (10YR 7/4) massive trona, with seams, averaging 10 mm in width, of colorless anhedral borax containing trace of interstitial grayish olive-green (5GY 3/2) clay; a few halite cubes modified by octahedron, averaging 2 mm in length, in lenticular horizontal vugs in upper 0.1 ft. Trona 70 percent, borax 30 percent. |
| 30.2 | .1 | Halite. Well-consolidated vuggy aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length. |
| 30.6 | .4 | Halite and trona. Densely packed granular aggregate of colorless halite, with 20 percent interstitial white (N 9) to very pale orange (10YR 8/2) massive trona; a few disseminated subhedral anhedral borax crystals averaging 2 mm at base. |
| 30.9 | .3 | Clay, pirssonite, and hanksite. Grayish-black (N 2) to dusky yellow-green (5GY 5/2) coarsely laminated clay; seam, 20 mm wide, of grayish-black (N 2) clay containing 30 percent disseminated pirssonite* sand at 40.0 ft; embedded subhedral hanksite crystals, averaging 50 mm in length, at top of section; laminae and irregular streaks, 1 mm wide, of moderate reddish-brown (10R 4/6) algae(?) chiefly in upper 0.2 ft. Clay 88 percent, pirssonite 7 percent, hanksite 5 percent. |
| 31.1 | .2 | Hanksite. Well-consolidated granular aggregate of subhedral colorless hanksite crystals with large euhedral colorless hanksite crystals, averaging 50 mm in length, embedded in clay at top. |
| 31.4 | .3 | Hanksite and trona. Dense granular aggregate of colorless hanksite with 30 percent interstitial very pale orange (10YR 8/2) massive trona. |
| 32.0 | .6 | Hanksite and trona. Dense granular aggregate of colorless hanksite, with 5 percent interstitial white (N 9) massive trona. |
| 32.8 | .8 | Halite and clay. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length, with trace of interstitial dusky yellow-green (5GY 5/2) clay; seam, 20 mm wide, of grayish-black (N 2) to dusky yellow-green (5GY 5/2) clay at base. Halite 92 percent, clay 8 percent. |
| 33.8 | 1.0 | No core. |
| 34.1 | .3 | Halite and clay. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length, with 5 percent interstitial greenish-black (5GY 2/1) to dark greenish-gray (5GY 4/1) clay. |
| 34.4 | .3 | Hanksite, halite, and clay. Fractured core. Fragments consisting of aggregates of euhedral to subhedral smoky hanksite crystals averaging 50 mm in length, with interstitial halite cubes modified by octahedron, averaging 2 mm in length, intermixed with dark greenish-gray (5GY 4/1) clay. Hanksite 85 percent, halite 10 percent, clay 5 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 34.6 | 0.2 | Hanksite and trona. Well-consolidated granular aggregate of colorless to smoky hanksite, with 5 percent interstitial white (N 9) massive trona. |
| 34.7 | .1 | Borax and trona. Vuggy aggregate of euhedral borax crystals from 10-50 mm in length, with 10 percent interstitial white (N 9) massive trona; a few pockets of fibrous trona. |
| 35.4 | .7 | Hanksite and trona. Well-consolidated dense granular aggregate of colorless to smoky hanksite, with 5 percent interstitial white (N 9) massive trona. |
| 35.7 | .3 | Halite and hanksite. Poorly consolidated mixture of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with scattered loose subhedral hanksite crystals averaging 30 mm in length; trace of interstitial white (N 9) massive trona and dark greenish-gray (5GY 4/1) clay. Halite 90 percent, hanksite 10 percent. |
| 36.0 | .3 | Halite. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length. |
| 36.3 | .3 | Halite. Well-consolidated granular aggregate of colorless halite with trace of interstitial olive-gray (5Y 4/1) clay. |
| 36.8 | .5 | No core. |
| 37.5 | .7 | Hanksite, clay, sulfohalite, and borax. Well-consolidated granular aggregate of smoky hanksite with 5 percent interstitial dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) clay; euhedral hanksite crystals, averaging 20 mm in length, at top, with scattered sulfohalite octahedrons averaging 5 mm in length, and a few subhedral borax crystals averaging 20 mm in length; pocket, 2 in. long, of halite cubes modified by octahedron, in lower 0.2 ft. |
| 37.7 | .2 | Halite, trona, and hanksite. Friable aggregate of halite cubes and cubes modified by octahedron, averaging 3 mm in length, with interstitial white (N 9) massive trona; a few disseminated smoky hanksite crystals up to 70 mm in length; trace of olive-gray (5Y 3/2) clay. Halite 90 percent, trona 5 percent, and hanksite 5 percent. |
| 38.0 | .3 | Hanksite and trona. Well-consolidated granular grayish-orange (10YR 7/4) aggregate of hanksite with 5 percent interstitial white (N 9) massive trona. |
| 38.1 | .1 | Borax and trona. Well-consolidated aggregate of colorless subhedral borax crystals averaging 20 mm in length, with 25 percent interstitial white (N 9) massive trona; trace of dusky yellow-green (5GY 5/2) clay. |
| 38.4 | .3 | Hanksite, halite, and clay. Dense granular dark smoky hanksite with 10 percent interstitial greenish-black (5GY 2/1) to dusky yellow-green (5GY 5/2) clay; pockets of colorless halite cubes and cubes modified by octahedron; thin clay seams, 20 mm wide, at top, with disseminated euhedral hanksite crystals averaging 20 mm in length. Hanksite 75 percent, halite 15 percent, clay 10 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 38.7 | 0.3 | Trona and halite. Fractured core. Fragments showing vuggy seams of very pale orange (10YR 8/2) massive trona containing disseminated colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. Trona 90 percent, halite 10 percent. |
| 38.9 | .2 | Trona and halite. Dense granular slightly vuggy aggregate of very pale orange (10YR 8/2) massive trona with 50 percent disseminated halite crystals averaging 3 mm in length; a few sulfahalite octahedra at base. |
| 40.4 | 1.5 | No core. |
| 41.7 | 1.3 | Trona and halite. Well-consolidated white (N9) to very pale orange (10YR 8/2) to grayish-orange (10YR 7/4) massive trona with irregular seams and disseminated crystals of colorless halite. Trona 60 percent, halite 40 percent. |
| 41.8 | .1 | Halite* and trona*. Well-consolidated granular aggregate of colorless halite* crystals averaging 5 mm in length, with interstitial massive trona*. Halite 75 percent, trona 25 percent. |
| 41.9 | .1 | Hanksite and trona. Fractured core. Fragments consisting of smoky euhedral to subhedral hanksite crystals averaging 20 mm in length, with 5 percent interstitial white (N9) massive trona. |
| 42.4 | .5 | Trona and halite. Well-consolidated slightly vuggy white (N9) to very pale orange (10YR 8/2) massive trona with 50 percent disseminated colorless halite crystals averaging 2 mm in length. |
| 43.1 | .7 | Halite and trona. Poorly consolidated aggregate of colorless halite cubes averaging 3 mm in length, with 25 percent interstitial yellowish-gray (5Y 7/2) to pale olive (10Y 6/2) massive trona. |
| 43.3 | .2 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent interstitial white (N9) to yellowish-gray (5Y 8/1) massive trona. |
| 43.8 | .5 | Trona. Well-consolidated white (N9) to very pale orange (10YR 8/2) slightly vuggy massive trona with a few small ½-in. pockets of colorless fibrous trona. |
| 44.0 | .2 | No core. |
| 44.3 | .3 | Trona and clay. Irregular vuggy seams 3-5 mm wide and pockets of colorless bladed trona with interstitial dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) clay; scattered halite cubes averaging 3 mm in length. Trona 90 percent, clay 10 percent. |
| 44.8 | .5 | Halite. Well-consolidated aggregate of colorless halite cubes averaging 3 mm in length. |
| 45.1 | .3 | Trona, hanksite, and halite. Massive to fibrous trona discolored grayish-olive (10Y 4/2) to grayish-yellow (5Y 8/4) by trace of intermixed clay; with irregular seams and pockets of smoky hanksite and colorless halite cubes averaging 3 mm in length. Trona 60 percent, hanksite 30 percent, halite 10 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 45.9 | 0.8 | Trona, hanksite, and clay. White (N 9) to pale-olive (10Y 6/2) to very pale orange (10YR 8/2) massive trona with seams, averaging 5 mm in width, of smoky hanksite and horizontal streaks, 1 in. long, of smoky hanksite; seam, 20 mm wide, of grayish-olive (10Y 4/2) to grayish-yellow (5Y 8/4) clay containing scattered euhedral hanksite crystals and a few sulfohalite octahedra at 46.2 ft. Trona 85 percent, hanksite 10 percent, clay 5 percent. |
| 46.8 | .9 | Halite and trona. Dense granular slightly vuggy aggregate of colorless halite crystals averaging 2 mm in length, with 35 percent interstitial very pale orange (10YR 8/2) massive trona; scattered horizontal vugs 3-5 mm wide. |
| 47.8 | 1.0 | No core. |
| 48.1 | .3 | Hanksite. Dense granular aggregate of smoky hanksite with a few streaks, 1 in. long, of white (N 9) massive trona. |
| 48.5 | .4 | Trona and halite. White (N 9) to yellowish-gray (5Y 7/2) to very pale orange (10YR 8/2) vuggy massive trona with 30 percent disseminated halite cubes averaging 2 mm in length; long horizontal vugs 1-2 mm wide. |
| 48.7 | .2 | Halite and trona. Fractured core. Poorly consolidated vuggy aggregate of halite cubes and cubes modified by octahedron, averaging 4 mm in length, with 25 percent interstitial white (N 9) massive trona; trace of greenish-black (5GY 2/1) clay. |
| 49.1 | .4 | Halite and trona. Fractured core. Vuggy aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial pale-olive (10Y 6/2) massive trona. |
| 49.4 | .3 | Halite and trona. Dense granular slightly vuggy aggregate of halite with 15 percent interstitial white (N 9) to grayish-yellow (5Y 8/4) massive trona; trace of smoky hanksite at base. |
| 49.6 | .2 | Hanksite, trona, and halite. Fractured core. Poorly consolidated fragments consisting of smoky hanksite seams averaging 10 mm in width, with seams of pale-olive (10Y 6/2) to pale greenish-yellow (10Y 8/2) massive trona containing disseminated colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. Hanksite 50 percent, trona 35 percent, and halite 15 percent. |
| 49.9 | .3 | Halite. Well-consolidated aggregate of colorless halite cubes averaging 3 mm in length, with trace of interstitial white (N 9) to grayish-yellow (5Y 8/4) massive trona. |
| 50.2 | .3 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 50 percent interstitial white (N 9) to pale-olive (10Y 6/2) massive trona. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 50.6 | 0.4 | Trona and halite. Well-consolidated slightly vuggy white (N 9) to very pale orange (10YR 7/4) massive trona with 10 percent disseminated colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length; trace of grayish-olive (10Y 4/2) clay; scattered ½-in. pockets of fibrous trona discolored grayish-yellow (5Y 8/4) by trace of clay. |
| 51.7 | 1.1 | Halite and trona. Well-consolidated slightly vuggy dense granular aggregate of halite cubes averaging 3 mm in length, with 50 percent interstitial white (N 9) to very pale orange (10YR 8/2) massive trona. |
| 51.9 | .2 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length, with 30 percent interstitial white (N 9) to dusky-yellow (5Y 6/4) to grayish-olive (10Y 4/2) massive trona discolored by traces of clay. |
| 52.3 | .4 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 50 percent white (N 9) to very pale orange (10YR 8/2) massive trona in interstices and seams. |
| 52.6 | .3 | Halite. Well-consolidated aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length. |
| 54.3 | 1.7 | Trona and halite. White (N 9) to very pale orange (10YR 8/2) massive trona in vuggy thin seams averaging 1-3 mm in width, with alternating seams and disseminated crystals of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length. Trona 60 percent, halite 40 percent. |
| 54.4 | .1 | No core. |
| 54.8 | .4 | Trona. White (N 9) soft massive trona. |
| 55.8 | 1.0 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 15 percent interstitial very pale orange (10YR 8/2) massive trona; trace of apthitalite (glaserite). |
| 56.4 | .6 | No core. |
| 56.9 | .5 | Halite and trona. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 1- to 2-in. pockets of white (N 9) to very pale orange (10YR 8/2) massive trona. Halite 98 percent, trona 2 percent. |
| 59.2 | 2.3 | Trona and halite. White (N 9) to very pale orange (10YR 8/2) vuggy massive trona with friable seams (averaging 5 mm in width), pockets, and disseminated crystals of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. Trona 60 percent, halite 40 percent. |
| 59.9 | .7 | Halite. Well-consolidated friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 60.2 | 0.3 | Halite and trona. Well-consolidated slightly vuggy aggregate of halite cubes and cubes modified by octahedron, averaging 2 mm in length, with 15 percent interstitial white (N 9) massive trona. |
| 61.2 | 1.0 | No core. |
| 61.3 | .1 | Trona and halite. White (N 9) to light greenish-gray (5GY 8/1) soft massive trona with 5 percent disseminated colorless halite cubes and cubes modified by octahedron, averaging 5 mm in length. |
| 61.4 | .1 | Halite. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with trace of interstitial white (N 9) trona. |
| 61.6 | .2 | Trona and halite. White (N 9) dense massive trona with scattered streaks, 1-2 mm wide, of colorless halite. Trona 99 percent, halite 1 percent. |
| 61.8 | .2 | Trona, halite, and clay. White (N 9) to very pale orange (10YR 8/2) to light olive-gray (5Y 5/2) massive trona with irregular pockets of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length; a few thin seams of black (N 1) to grayish-yellow (5Y 8/4) interstitial clay. Trona 69 percent, halite 30 percent, clay 1 percent. |
| 62.2 | .4 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length, with 20 percent interstitial white (N 9) to colorless massive and fibrous trona. |
| 62.6 | .4 | Trona and clay. White (N 9) to yellowish-gray (5Y 8/1) massive trona with irregular streaks, 1-5 mm wide, of greenish-black (5GY 2/1) clay; a few disseminated colorless halite cubes averaging 3 mm in length and scattered sulfohalite octahedra up to 15 mm in length, averaging 3 mm. Trona 98 percent, clay 2 percent. |
| 62.8 | .2 | Hanksite and clay. Euhedral to subhedral hanksite crystals averaging 30 mm in length, with 5 percent interstitial greenish-black (5GY 2/1) clay. |
| 64.4 | 1.6 | Halite and trona. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial white (N 9) massive trona; a few sulfohalite octahedra disseminated throughout. |
| 65.2 | .8 | Trona and halite. Core fractured. White (N 9) massive trona with 5 percent disseminated halite cubes, cubes modified by octahedron, and octahedra, averaging 2 mm in length. |
| 65.3 | .1 | No core. |
| 67.6 | 2.3 | Trona. Core fractured in lower 1.3 ft. Poorly consolidated white (N 9) soft massive trona, with fragments of white (N 9) massive trona in lower 1.3 ft; seam of smoky anhedral hanksite, averaging 5 mm in width, at 66.5 ft; a few disseminated colorless halite cubes modified by octahedron, from 66.3 to 66.5 ft. |
| 69.5 | 1.9 | No core. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 70.0 | 0.5 | Trona. Poorly consolidated white (N 9) soft massive trona. May be cuttings, not core. |
| 71.3 | 1.3 | Trona. Well-consolidated white (N 9) soft massive trona; seams, 5 mm wide, of dusky-yellow (5Y 6/4) massive trona at 71.2 and 71.3 ft, probably discolored by intermixed clay; single colorless euhedral hanksite crystal 20 mm in length at 70.9 ft. |
| 71.8 | .5 | Trona. Fractured core. Fragments consisting of alternating seams, averaging 5 mm in width, of white (N 9) massive trona, locally discolored yellowish-gray (5Y 7/2) to pale-olive (10Y 6/2); a few fragments show wavy seams of trona. |
| 72.3 | .5 | No core. |
| 72.5 | .2 | Trona and borax. Seams of white (N 9) massive trona with alternating seams of irregular width, from 5–20 mm wide, of colorless subhedral borax crystals, averaging 3 mm in length, containing trace of grayish-yellow (5Y 8/4) interstitial fibrous trona; trona discolored dark yellowish-brown (10YR 4/2) to grayish-black (N 2) by trace of clay in lower 0.1 ft. Trona 60 percent, borax 40 percent. |
| 72.8 | .3 | Clay. Core fractured. Greenish-gray (5G 6/1) to olive-gray (5Y 4/1) to dusky yellow-green (5GY 5/2) to dusky-yellow (5Y 6/4) to moderate olive-brown (5Y 4/4) finely laminated clay. |
| 73.7 | .9 | Clay and pirssonite.* Olive-gray (5Y 3/2) to grayish-black (N 2) to grayish-yellow (5Y 8/4) to greenish-black (5GY 2/1) finely laminated clay with 20 percent disseminated anhedral pirssonite* crystals and thin seams, 1 mm wide or less, of pirssonite. |
| 74.1 | .4 | Clay. Grayish-black (N 2) to grayish-green (10GY 5/2 and 5G 5/2) to olive-gray (5Y 3/2) to grayish-yellow (5Y 8/4) finely laminated clay with a few disseminated anhedral gaylussite crystals. |
| 74.6 | .5 | Clay and gaylussite. Grayish-black (N 2) to olive-gray (5Y 3/2) to dusky yellow-green (5GY 5/2) to grayish yellow-green (5GY 7/2) finely laminated clay with 20 percent disseminated anhedral gaylussite crystals and thin seams, 1 mm or less in width, of anhedral gaylussite. |
| 76.2 | 1.6 | Clay. Greenish-black (5GY 2/1) to grayish-black (N 2) to grayish-green (5GY 6/1) to pale greenish-yellow (10Y 8/2) to grayish-olive (10Y 4/2) to light greenish-gray (5GY 8/1) coarsely laminated clay. |
| 76.5 | .3 | Clay. Grayish-black (N 2) to greenish-black (5GY 2/1) to pale greenish-yellow (10Y 8/2) to pale yellowish-orange (10YR 8/6) finely laminated clay with seam, 1 mm wide, of gaylussite sand at 76.3 ft; a few disseminated anhedral gaylussite* crystals averaging 10 mm in length. |
| 76.6 | .1 | No core. |
| 77.7 | 1.1 | Clay. Core badly fractured. Fragments of greenish-black (5GY 2/1) to grayish-yellow (5Y 8/1) to grayish-black (N 2) to very light gray (N 7) clay, coarsely laminated in some fragments. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 78.4 | 0.7 | Clay. Grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) to grayish-yellow (5Y 8/4) to pale yellowish-orange (10YR 8/6) to grayish-green (5G 5/2) finely laminated clay. |
| 78.9 | .5 | Clay. Grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) to dusky yellow-green (5GY 5/2) to pale yellowish-orange (10YR 8/6) to very light gray (<i>N</i> 7) finely laminated clay; laminae faulted and contorted along steep angle fault. |
| 79.9 | 1.0 | Clay and aragonite. Grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) to grayish-yellow (5Y 8/1) to grayish-olive (10Y 4/2) clay, coarsely laminated with widely spaced laminae of pale yellowish-orange (10YR 8/6) to very light gray (<i>N</i> 8) soft massive finely crystalline aragonite. Clay 95 percent, aragonite 5 percent. |
| 80.2 | .3 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) clay with 60 percent disseminated anhedral gaylussite crystals averaging 5 mm in length. |
| 80.7 | .5 | Clay and gaylussite.* Greenish-black (5GY 2/1) to dusky, yellow-green (5GY 5/2) to blackish-red (5R 5/2) to grayish-green (10G 4/2 and 10G 5/2) coarsely laminated clay, laminae revealed by color differences, with 60 percent anhedral gaylussite* crystals disseminated in black (<i>N</i> 1) clay at 80.5 to 80.6 ft; thin seam, 2 mm wide, of euhedral gaylussite crystals, averaging 1 mm in length, at 80.6 ft. Clay 88 percent, gaylussite 12 percent. |
| 81.3 | .6 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to grayish-green (10G 4/2) faintly coarsely laminated clay, laminae revealed by faint color differences, with 50 percent disseminated euhedral gaylussite crystals from 1 to 5 mm in length; numerous moderate reddish-orange (10R 6/6) algae(?) streaks throughout. |
| 82.1 | .8 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to grayish-green (10G 4/2) coarsely laminated clay with numerous moderate reddish-orange (10R 6/6) algae(?) streaks, less than 1 mm wide, throughout grayish-black (<i>N</i> 2) clay in lower 0.4 ft; seams, 10 mm wide, of 50 percent disseminated euhedral gaylussite crystals at 81.8 and 81.9 ft. Clay 96 percent, gaylussite 4 percent. |
| 82.2 | .1 | No core. |
| 83.7 | 1.5 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) to dusky yellow-green (5GY 5/2) coarsely laminated clay, laminae revealed by color differences, with 30 percent disseminated euhedral gaylussite crystals averaging 1 mm in length; distinct seams, 1 mm wide, of moderate reddish-brown (10R 4/6) algae(?) at 82.8, 83.0, and 83.5 ft, and additional vague blackish-red (5R 2/2) algal(?) discolorations throughout. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 85.9 | 2.2 | Trona. White (N 9) to light greenish-gray (5GY 8/1) to dark greenish-gray (5GY 4/1) soft porous massive and fine fibrous trona with numerous vuggy pockets lined with colorless fibrous trona containing traces of interstitial grayish-yellow (5Y 8/4) clay; irregular pocket of colorless trona blades averaging 10 mm in length in upper 0.1 ft; scattered pockets of very pale orange (10YR 8/2) massive trona in lower 0.6 ft which is dominantly fibrous trona; seam, 10 mm wide, of black (N 1) clay with 50 percent disseminated euhedral pirssonite crystals averaging 1 mm in length and thin irregular seams, less than 1 mm wide, of moderate reddish-brown (10R 4/6) algae(?) at 85.7 ft. |
| 86.3 | .4 | Clay, trona, and pirssonite. Greenish-black (5GY 2/1) clay with a few disseminated trona blades averaging 10 mm in length and euhedral pirssonite crystals averaging 10 mm in length. |
| 88.2 | 1.9 | No core. |
| 88.4 | .2 | Clay and pirssonite. Black (N 1) clay with 25 percent disseminated pirssonite sand. |
| 89.9 | 1.5 | Trona and clay. White (N 9) to yellowish-gray (5Y 8/1) compact fine fibrous trona with scattered 1-in. pockets of medium light-gray (N 6) massive trona and numerous irregular streaks and pockets of interstitial medium dark-gray (N 4) to dark-gray (N 3) clay. Trona 98 percent, clay 2 percent. |
| 91.0 | 1.1 | Trona, halite, and clay. White (N 9) dense hard massive trona with irregular pockets and streaks of colorless halite cubes modified by octahedron, averaging 5 mm in length; fine fibrous trona in interstices of halite crystals discolored by interstitial greenish-black (5GY 2/1) clay in upper 0.6 ft. Trona 94 percent, halite 5 percent, and clay 1 percent. |
| 91.2 | .2 | Halite. Friable aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with inclusions of moderate reddish-orange (10R 6/6) algae(?). |
| 91.7 | .5 | Trona and halite. White (N 9) to grayish-yellow (5Y 8/4) dense hard slightly vuggy massive trona with 15 percent disseminated colorless halite crystals and trace of dark greenish-gray (5GY 4/1) clay in irregular seams and pockets. |
| 91.8 | .1 | Trona. Very light gray (N 7) to greenish-gray (5GY 6/1) massive sugary-textured trona with distinct seams discolored moderate reddish-orange (10R 6/6) by algae(?) at base. |
| 92.2 | .4 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron, with 20 percent interstitial white (N 9) massive trona. |
| 92.5 | .3 | No core. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 92.8 | 0.3 | Trona and halite. Well-consolidated white (N 9) to greenish-gray (5GY 6/1) massive trona with irregular streaks and pockets of colorless halite cubes modified by octahedron, averaging 3 mm in length; distinct seams, 2 mm wide, of trona discolored moderate reddish-brown (10R 4/6) by algae(?) at 92.5 and 92.7 ft. Trona 75 percent, halite 25 percent. |
| 94.4 | 1.6 | Clay, pirssonite, and borax. Greenish-black (5GY 2/1) clay with 40 percent disseminated euhedral to subhedral pirssonite crystals averaging 10 mm in length; a few disseminated euhedral borax crystals, averaging 20 mm in length, in greenish-black clay at 93.8 ft. |
| 94.6 | .2 | Clay, pirssonite, and borax. Black (N 1) clay with 39 percent disseminated pirssonite sand; seam, 15 mm wide of 50 percent disseminated euhedral borax crystals averaging 20 mm in length at base. Clay 65 percent, pirssonite 23 percent, borax 12 percent. |
| 95.0 | .4 | Trona. Well-consolidated aggregate of colorless trona blades averaging 10 mm in length, with trace of interstitial dark greenish-gray (5GY 4/1) clay. |
| 95.4 | .4 | Trona. Fine colorless fibrous trona with trace of interstitial dark greenish-gray (5GY 4/1) clay. |
| 95.6 | .2 | Halite. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with trace of interstitial white (N 9) massive trona. |
| 95.8 | .2 | Trona and clay. White (N 9) to light greenish-gray (5GY 8/1) massive trona with irregular streaks of intermixed grayish-black (N 2) clay. Trona 98 percent, clay 2 percent. |
| 97.1 | 1.3 | No core. |
| 97.7 | .6 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 4 mm in length, with irregular streaks and pockets of fine fibrous trona discolored greenish-black (5GY 2/1) to dark greenish-gray (5GY 4/1) by trace of interstitial clay. Halite 90 percent, trona 10 percent. |
| 97.8 | .1 | Clay and pirssonite. Black (N 1) clay with 40 percent disseminated pirssonite crystals averaging 1 mm in length. |
| 98.1 | .3 | Trona and halite. White (N 9) to greenish-black (5GY 2/1) massive and fine fibrous trona discolored by trace of interstitial clay; scattered pockets of colorless halite cubes modified by octahedron, averaging 2 mm in length. Trona 99 percent, halite 1 percent. |
| 99.0 | .9 | Halite. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 5 mm in length; trace of interstitial white (N 9) massive trona in lower 0.1 ft. |
| 99.2 | .2 | Trona. Well-consolidated vuggy aggregate of colorless trona blades averaging 5 mm in length, with 1-in. pockets of medium-gray (N 5) massive trona discolored by trace of intermixed clay; a few disseminated halite cubes modified by octahedron, averaging 5 mm in length. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 99.3 | 0.1 | Clay, pirssonite, and hanksite. Black (<i>N</i> 1) clay with 25 percent disseminated pirssonite sand; a few disseminated white (<i>N</i> 9) opaque octahedra of sulfahalite* with minor intermixed gaylussite* at top; 10 percent disseminated colorless trona blades, averaging 10 mm in length, throughout; disseminated euhedral hanksite crystals, averaging 25 mm in length, at base. Clay 55 percent, pirssonite 25 percent, hanksite 10 percent, trona 10 percent. |
| 99.4 | .1 | Trona. Well-consolidated white (<i>N</i> 9) to light-gray (<i>N</i> 7) massive trona. |
| 99.7 | .3 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 25 percent interstitial yellowish gray (5Y 8/1) massive trona. |
| 100.2 | .5 | Trona and borax. Well-consolidated aggregate of trona blades averaging 10 mm in length, with 25 percent interstitial white (<i>N</i> 9) to light greenish-gray (5GY 8/1) massive trona; 35 percent disseminated subhedral borax crystals, averaging 20 mm in length, in lower 0.3 ft. Trona 80 percent, borax 20 percent. |
| 101.8 | 1.6 | No core. |
| 102.1 | .3 | Burkeite. Grayish-yellow (5Y 8/4) to pale yellowish-orange (10YR 8/6) dense hard massive burkeite. |
| 102.3 | .2 | Halite. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 102.5 | .2 | Trona. Well-consolidated white (<i>N</i> 9) to light greenish-gray (5GY 8/1) to medium light-gray (<i>N</i> 6) massive trona. |
| 102.8 | .3 | Halite. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 103.2 | .4 | No core. |
| 104.3 | 1.1 | Halite and clay. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with seam, 5 mm wide, of greenish-black (5GY 2/1) clay at 103.9 ft; trace of interstitial white (<i>N</i> 9) to colorless massive and fibrous trona in lower 0.5 ft. Halite 99 percent, clay 1 percent. |
| 104.5 | .2 | Burkeite and trona. Vuggy aggregate of grayish-yellow (5Y 8/4) to pale yellowish-orange (10YR 8/6) hard massive burkeite in lenticular pockets with interstitial white (<i>N</i> 9) to greenish-gray (5GY 6/1) massive trona containing intermixed colorless trona blades averaging 10 mm in length. Burkeite 50 percent, trona 50 percent. |
| 104.7 | .2 | Halite. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 104.9 | .2 | Burkeite. Grayish-orange (10YR 7/4) massive hard slightly vuggy burkeite. |
| 105.1 | .2 | Trona and clay. Medium light-gray (<i>N</i> 6) massive trona with pockets of colorless fibrous trona; irregular streaks, 1 mm wide, of grayish-black (<i>N</i> 2) clay and traces of interstitial clay throughout. Trona 99 percent, clay 1 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 105.3 | 0.2 | Burkeite, trona, halite, and borax. Core badly fractured. Fragments consisting of (a) grayish-orange (10YR 7/4) hard massive burkeite, (b) aggregates of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, (c) halite crystal aggregates with pockets of burkeite, (d) scattered subhedral borax crystals associated with halite; greenish-gray (5GY 6/1) massive trona intermixed with fragments. Burkeite 50 percent, trona 30 percent, halite 19 percent, borax 1 percent. |
| 105.6 | .3 | No core. |
| 105.9 | .3 | Trona and halite. White (N 9) to greenish-gray (5GY 6/1) soft massive trona with 10 percent disseminated colorless halite cubes, cubes modified by octahedron, and anhedral, averaging 3 mm in length; a few grayish-yellow (5Y 8/4) rounded nodules of massive burkeite averaging 10 mm in length. Probably cuttings, not core. |
| 106.0 | .1 | Burkeite*. Vuggy seam of grayish-yellow (5Y 8/4) hard massive burkeite*. |
| 106.5 | .5 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 5 percent interstitial white (N 9) to greenish-gray (5GY 6/1) massive trona. |
| 106.6 | .1 | Clay and trona. Greenish-black (5GY 2/1) to grayish-black (N 2) to blackish-red (5R 2/2) to dark reddish-brown (10R 3/4) clay, locally discolored by intermixed algae(?), with irregular seam, 10-20 mm wide, of white (N 9) massive trona at base. Clay 50 percent, trona 50 percent. |
| 106.7 | .1 | Trona. White (N 9) to dark greenish-gray (5G 4/1) to greenish-black (5GY 2/1) massive trona, discolored by trace of intermixed clay. |
| 106.9 | .2 | Burkeite*, halite, trona, and borax. Pockets of grayish-yellow (5Y 8/4) massive burkeite* with intermixed interstitial colorless halite cubes modified by octahedron, averaging 10 mm in length, and colorless trona blades and fibrous trona locally discolored moderate orange-pink (5YR 8/4) by algae(?); a few euhedral borax crystals, averaging 5 mm in length, disseminated in pockets with burkeite*. Burkeite 60 percent, halite 25 percent, trona 15 percent. |
| 107.2 | .3 | Halite. Moderately friable aggregate of colorless to faintly tinted grayish orange-pink (10YR 8/2) halite cubes and cubes modified by octahedron, averaging 2 mm in length, with trace of interstitial colorless fibrous trona. |
| 107.3 | .1 | Trona. White (N 9) massive sugary-textured trona. |
| 107.4 | .1 | Burkeite. Grayish-yellow (5Y 8/4) hard dense massive burkeite. |
| 107.7 | .3 | Trona, burkeite, and halite. White (N 9) to light greenish-gray (5GY 8/1) massive trona with vuggy seams, averaging 5 mm in width, lined with colorless fibrous trona containing minor interstitial grayish-orange (10YR 7/4) massive trona, and euhedral colorless halite cubes modified by octahedron, averaging 4 mm in length; irregular streaks |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| | | and pockets of grayish-orange (10YR 7/4) to moderate yellowish-brown (10YR 5/4) massive burkeite; trace of greenish-black (5GY 2/1) clay in irregular streak at 107.6 ft; scattered euhedral borax crystals, averaging 15 mm in length, at base. Trona 75 percent, burkeite 20 percent, halite 5 percent. |
| 108.3 | 0.6 | Clay and gaylussite. Greenish-black (5GY 2/1) to grayish-black (N 2) to grayish-yellow (5Y 8/4) to very light gray (N 7) finely laminated clay with 15 percent disseminated gaylussite silt; a few laminae, less than 1 mm wide, discolored moderate reddish-brown (10R 4/6) by algae(?). |
| 108.5 | .2 | Trona and sulfahalite*. White (N 9) to grayish-yellow (5Y 8/4) fine fibrous trona intermixed with colorless trona blades averaging 10 mm in length; fine fibrous trona locally discolored moderate orange-pink (10R 7/4) by algae(?); disseminated rounded nodules, averaging 2 mm in length, of grayish-orange (10YR 7/4) sulfahalite* 10 mm from top. |
| 108.7 | .2 | Burkeite. Fractured core. Fragments of grayish-orange (10YR 7/4) hard dense massive burkeite. |
| 109.4 | .7 | No core. |
| 109.9 | .5 | Clay and gaylussite. Greenish-black (5GY 2/1) to grayish-olive (10Y 4/2) to pale-olive (10Y 6/2) to grayish-yellow (5Y 8/4) finely laminated clay with 10 percent disseminated gaylussite silt. |
| 110.1 | .2 | Clay and gaylussite. Greenish-black (5GY 2/1) to grayish-black (N 2) to moderate-brown (5YR 4/4) clay with disseminated euhedral gaylussite crystals averaging 10 mm in length and seams, 1-2 mm wide, of disseminated colorless euhedral gaylussite sand. Clay 50 percent, gaylussite 50 percent. |
| 110.5 | .4 | Clay and gaylussite. Greenish-black (5GY 2/1) to grayish-black (N 2) to pale-olive (10Y 6/2) to grayish-yellow (5Y 8/4) finely laminated clay with 15 percent disseminated gaylussite sand. |
| 110.7 | .2 | Clay. Grayish-black (N 2) to greenish-black (5GY 2/1) clay with numerous laminae, less than 1 mm in width, of discolored moderate reddish-brown (10R 4/6) by algae(?). |
| 111.0 | .3 | Trona. Densely packed aggregate of colorless trona blades, averaging 20 mm in length, discolored grayish-black (N 2) by trace of interstitial clay. |
| 112.2 | 1.2 | Trona. Well-consolidated aggregate of colorless to grayish-yellow (5Y 8/4) fibrous trona with pockets and irregular seams of white (N 9) to medium-gray (N 5) massive trona; local traces of interstitial black (N 1) clay. |
| 112.7 | .5 | Clay and northupite. Greenish-black (5GY 2/1) to pale-olive (10Y 6/2) to very light gray (N 7) finely laminated clay with 5 percent disseminated nodules, averaging 1 mm in length, of white (N 9) massive northupite. |
| 112.8 | .1 | Clay and gaylussite. Greenish-black (5GY 2/1) clay with 40 percent disseminated euhedral gaylussite crystals averaging 1 mm in length. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 113. 1 | 0. 3 | Clay and gaylussite. Greenish-black (5GY 2/1) clay with 25 percent disseminated gaylussite silt. |
| 113. 2 | . 1 | Trona. Well-consolidated aggregate of colorless trona blades averaging 5 mm in length, locally discolored grayish-yellow (5Y 8/4) by trace of interstitial clay. |
| 113. 4 | . 2 | No core. |
| 113. 9 | . 5 | Trona. Fractured core. Fragments consisting of aggregates of white (N 9) to colorless trona blades averaging 5 mm in length. |
| 114. 4 | . 5 | Clay. Grayish-black (N 2) to greenish-black (5GY 2/1) to light olive-gray (5Y 5/2) to grayish-yellow (5Y 8/4) to very light gray (N 8) finely laminated clay. |
| 114. 8 | . 4 | Clay and gaylussite. Grayish-black (N 2) to greenish-black (5GY 2/1) to olive-gray (5Y 3/2) to moderate yellowish-brown (10YR 5/4) clay with 40 percent disseminated eu-hedral gaylussite crystals averaging 5 mm in length. |
| 115. 4 | . 3 | Clay. Grayish-black (N 2) to medium-gray (N 5) to light-gray (N 7) to grayish-yellow (5Y 8/4) finely laminated clay. |
| 115. 6 | . 2 | Clay and gaylussite. Greenish-black (5GY 2/1) to grayish-black (N 2) to grayish-olive (10Y 4/2) faintly finely laminated clay with 25 percent disseminated gaylussite silt. |
| 117. 4 | 1. 8 | Trona. White (N 9) to medium light-gray (N 6) to dark-gray (N 3) seams of massive trona with seams and irregular pockets of colorless to grayish-yellow (5Y 8/4) trona blades averaging 10 mm in length; 50 percent interstitial grayish-black (N 2) clay in upper 0.1 ft containing small streaks, 1-5 mm long, of moderate reddish-brown (10R 4/6) algae(?) discolorations. |
| 118. 2 | . 8 | No core. |
| 119. 0 | . 8 | Trona. White (N 9) to medium light-gray (N 6) massive trona seams with seams and irregular pockets of colorless trona blades averaging 10 mm in length; trace of greenish-black (5GY 2/1) clay. |
| 119. 1 | . 1 | Trona and clay. Densely packed hard aggregate of trona blades averaging 5 mm in length, with 5 percent interstitial greenish-black (5GY 2/1) clay. |
| 120. 1 | . 9 | No core. |
| 123. 0 | 3. 0 | Clay and gaylussite. Light olive-gray (5Y 5/2) to olive-gray (5Y 3/2) to dusky yellow-green (5GY 5/2) clay with 40 percent disseminated eu-hedral gaylussite crystals from 2 to 30 mm in length, averaging 10 mm. |
| 125. 1 | 2. 1 | Clay and gaylussite. Light olive-gray (5Y 5/2) to olive-gray (5Y 3/2) to dark greenish-gray (5G 4/1) clay with 40 percent disseminated gaylussite crystals averaging 15 mm in length. |
| 124. 4 | . 3 | No core. |

Searles drill hole GS-16

LOCATION: Searles Lake, Calif., at common cor., secs. 26, 27, 34, and 35, T. 25 S., R., 43 E., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,616 ft.

ELEVATION AT BOTTOM OF HOLE: 1,486 ft.

TOTAL DEPTH: 130.0 ft.

DATES DRILLED: March 14-28, 1955.

CASING USED: 84.0 ft of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*); minerals identified by X-ray diffraction methods are denoted by two asterisks (**).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 0.5 | 0.5 | Halite and clay. Friable vuggy aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 10 mm in length, with 5 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 2.1 | 1.6 | Halite and clay. Unconsolidated mixture of colorless halite cubes modified by octahedron and subhedra, averaging 5 mm in length, with 5 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 2.2 | .1 | No core. |
| 4.3 | 2.1 | Halite and clay. Unconsolidated mixture of colorless halite cubes, cubes modified by octahedron, and subhedra, up to 15 mm in length, averaging 5 mm, with 5 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 6.3 | 2.0 | Halite, hanksite, and clay. Unconsolidated mixture of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 3 mm in length, with 15 percent interstitial dusky yellow-green (5GY 5/2) clay; numerous disseminated subhedral smoky hanksite crystals up to 75 mm in length, averaging 40 mm. Probably cuttings, not core. Halite 70 percent, hanksite 29 percent, clay 1 percent. |
| 6.4 | .1 | No core. |
| 8.3 | 1.9 | Halite and clay. Unconsolidated mixture of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 3 mm in length, with 20 percent intermixed halite sand and 1 percent intermixed dusky yellow-green (5GY 5/2) clay; scattered anhedral rounded smoky hanksite crystals averaging 20 mm in length. Probably cuttings, not core. |
| 8.4 | .1 | No core. |
| 8.9 | .5 | Halite. Unconsolidated halite sand discolored dusky yellow green (5GY 5/2) by intermixed clay; 10 percent disseminated colorless halite cubes and subhedra, averaging 2 mm in length. |
| 9.8 | .9 | Halite and clay. Unconsolidated mixture of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 5 mm in length, with 5 percent interstitial dusky yellow-green (5GY 5/2) clay; a few loose disseminated subhedral hanksite crystals averaging 40 mm in length. |
| 9.9 | .1 | No core. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 10.5 | 0.6 | Halite and clay. Unconsolidated mixture of colorless halite cubes modified by octahedron and subhedra, averaging 5 mm in length, with 10 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 10.9 | .4 | Clay and halite. Soft tenacious dusky yellow-green (5GY 5/2) clay with 40 percent disseminated colorless halite cubes modified by octahedron and subhedra, up to 20 mm in length, averaging 5 mm. |
| 11.0 | .1 | No core. |
| 11.8 | .8 | Halite and hanksite. Unconsolidated mixture of colorless halite cubes and cubes modified by octahedron, up to 10 mm in length, averaging 2 mm, with 10 percent loose disseminated subhedral to euhedral yellowish hanksite crystals up to 30 mm in length, averaging 15 mm; trace of interstitial dusky yellow-green (5GY 5/2) clay. |
| 11.9 | .1 | No core. |
| 12.7 | .8 | Clay, hanksite, and pirssonite. Poorly consolidated dusky yellow-green (5GY 5/2) clay with 20 percent disseminated crystals euhedral colorless to light-yellowish hanksite crystals averaging 5 mm in length; a few colorless halite cubes modified by octahedron or subhedra, averaging 3 mm in length; fragments of dusky yellow-green (5GY 5/2) and grayish-black (N 2) clay with 20 percent disseminated euhedral pirssonite crystals, averaging 1 mm in length, in grayish-black (N 2) clay seams. Clay 78 percent, hanksite 20 percent, pirssonite 2 percent. |
| 13.7 | 1.0 | Halite, clay, and pirssonite. Friable aggregate of colorless halite cubes modified by octahedron, subhedra, and anhedral, averaging 10 mm in length, with seams of intermixed dusky yellow-green (5GY 5/2) to grayish-black (N 2) clay with 10 percent disseminated euhedral pirssonite silt and fine sand. Halite 89 percent, clay 10 percent, pirssonite 1 percent. |
| 13.8 | .1 | No core. |
| 14.1 | .3 | Halite and clay. Moderately friable aggregate of colorless halite cubes modified by octahedron and subhedra, up to 20 mm in length, averaging 5 mm, with 1 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 15.0 | .9 | Halite and clay. Unconsolidated aggregate of colorless halite cubes modified by octahedron and subhedra, up to 20 mm in length, averaging 5 mm, with 5 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 15.7 | .7 | Halite and clay. Friable aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 5 mm in length, with 3 percent dusky yellow-green (5GY 5/2) clay in interstices and thin seams with intermixed halite. |
| 15.8 | .1 | No core. |
| 16.2 | .4 | Halite. Core fractured. Friable aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 4 mm in length, with trace of interstitial dusky yellow-green (5GY 5/2) clay. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 17.0 | 0.8 | Halite. Unconsolidated mixture of colorless halite cubes modified by octahedron and subhedra, up to 40 mm in length, averaging 4 mm, with 10 percent interstitial fine halite sand discolored dusky yellow-green (5GY 5/2) by trace of intermixed clay. |
| 17.2 | .2 | Halite and clay. Core fractured. Friable aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 5 mm in length, with 1 percent interstitial dusky yellow-green (5GY 5/2) clay. |
| 17.5 | .3 | No core. |
| 18.4 | .9 | Halite. Unconsolidated dusky yellow-green (6GY 5/2) to white (N 9) fine halite sand with 5 percent disseminated colorless halite cubes modified by octahedron and subhedra, averaging 5 mm in length. Probably cuttings, not core. |
| 20.1 | 1.7 | Hanksite and halite. Unconsolidated mixture of colorless to light-yellowish euhedral to subhedral hanksite crystals from 1 to 40 mm in length, averaging 3 mm, with numerous inclusions of dark yellowish-orange (10YR 6/6) algae(?); 1 percent colorless halite cubes modified by octahedron, averaging 5 mm in length, disseminated throughout. |
| 21.4 | 1.3 | No core. |
| 22.5 | 1.1 | Hanksite and halite. Unconsolidated mixture of euhedral to subhedral colorless to yellowish hanksite crystals averaging 5 mm in length; with 1 percent disseminated colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length; 5 percent interstitial halite sand discolored (5GY 7/2) grayish yellow green by trace of interstitial clay. |
| 22.9 | .4 | Hanksite. Well-consolidated slightly vuggy aggregate of euhedral yellowish hanksite crystals to 20 mm in length, averaging 5 mm, with scattered colorless halite cubes modified by octahedron from 3 to 20 mm in length. |
| 25.3 | 2.4 | No core. |
| 25.8 | .5 | Hanksite and halite. Unconsolidated mixture of euhedral to anhedral yellowish hanksite crystals up to 80 mm in length, averaging 30 mm, with common inclusions of dark yellowish-orange (10YR 6/6) algae(?); 10 percent interstitial white (N 9) to colorless halite sand (probably cuttings, not core); trace of dusky yellow-green (5GY 5/2) clay in interstices of hanksite crystals; single euhedral colorless borax crystal 25 mm in length. |
| 26.3 | .5 | Halite and trona. Dense granular aggregate of colorless halite crystals with 10 percent interstitial white (N 9) to very pale orange (10YR 8/2) massive trona; scattered pinpoint inclusions of pale yellowish-orange (10YR 8/6) algae(?) in halite; trace of interstitial colorless bladed trona, blades averaging 10 mm in length, in lower 0.1 ft. |
| 26.5 | .2 | Halite, clay, and trona. Dense granular aggregate of colorless halite crystals with 5 percent interstitial pale greenish-yellow (10YR 8/2) clay; numerous small pockets of colorless fibrous trona in interstices of halite in lower 0.1 ft. Halite 93 percent, clay 5 percent, trona 2 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 26. 7 | 0. 2 | Borax and clay. Dense aggregate of subhedral to anhedral borax crystals averaging 20 mm in length, with irregular seam, varying from 5 to 20 mm in width, of dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) clay at top. Borax 80 percent, clay 20 percent. |
| 26. 8 | . 1 | Trona and halite. Compact massive very pale orange (10YR 8/2) trona with a few embedded colorless halite subhedra averaging 10 mm in length; discontinuous seam, 1 mm wide, of intermixed dark yellowish-orange (10YR 6/6) algae(?) at base. Trona 99 percent, halite 1 percent. |
| 27. 3 | . 5 | Halite. Granular aggregate of colorless halite crystals averaging 3 mm in length, with numerous pinpoint inclusions of dark yellowish-orange (10YR 6/6) algae(?); trace of interstitial dusky yellow-green (5GY 5/2) clay. |
| 27. 4 | . 1 | Trona and halite. Very pale orange (10YR 8/2) compact massive trona with pinpoint inclusions of dark yellowish-orange (10YR 6/6) algae(?); 20 percent disseminated colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. |
| 29. 6 | 2. 2 | No core. |
| 29. 9 | . 3 | Halite and clay. Well-consolidated granular aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 2 percent interstitial grayish olive-green (5GY 3/2) clay. |
| 30. 4 | . 5 | Halite and trona. Well-consolidated vuggy seams, averaging 5 mm in width, of colorless subhedral halite cubes modified by octahedron, white (N 9) massive trona, and intermixed colorless halite and white (N 9) massive trona; trace of intermixed grayish olive-green (5GY 3/2) clay with halite containing pinhead inclusions of algae(?) at 30.0 ft; vague seam, ½ mm wide, of dark yellowish-orange (10YR 6/6) algae(?) at 29.65 ft. Halite 60 percent, trona 40 percent. |
| 30. 9 | . 5 | Halite and trona. Dense granular aggregate of colorless halite crystals, averaging 3 mm in length, with 10 percent interstitial very pale orange (10YR 8/2) massive trona. |
| 31. 0 | . 1 | Halite, trona, and clay. Well-consolidated aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with seams, 5 mm wide, of dark greenish-gray (5GY 4/1) massive trona containing intermixed grayish-olive (10Y 4/2) clay at top and base; pinpoint inclusions of dark yellowish-orange (10YR 6/6) algae(?) in halite and trona. Halite 50 percent, trona 40 percent, clay 10 percent. |
| 31. 1 | . 1 | Halite and trona. Dense granular aggregate of colorless halite crystals with 5 percent interstitial white (N 9) to very pale orange (10YR 8/2) massive trona. |
| 31. 4 | . 3 | Halite and clay. Friable slightly vuggy aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 5 mm in length, with seam, 5 mm wide, of grayish-olive (10Y 4/2) clay at 31.2 ft and irregular seam, 5 to 20 mm wide, of grayish-olive (10Y 4/2) to dusky yellow-green |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| | | (5GY 5/2) to greenish-black (5GY 2/1) clay at base; a few disseminated sulfahalite octahedra, averaging 3 mm in length, in clay seams. Halite 75 percent, clay 25 percent. |
| 32.0 | 0.6 | Halite and clay. Unconsolidated mixture of colorless halite cubes, cubes modified by octahedron, and subhedra, up to 10 mm in length, averaging 2 mm, with 2 percent intermixed dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) clay. |
| 33.8 | 1.8 | No core. |
| 34.1 | .3 | Halite and borax. Unconsolidated mixture of colorless halite sand with intermixed halite cubes modified by octahedron, averaging 3 mm in length, disseminated colorless subhedral borax crystals averaging 25 mm in length, and a few sulfahalite octahedra averaging 5 mm in length. Probably cuttings, not core. Halite 80 percent, borax 20 percent. |
| 34.9 | .8 | Halite and trona. Well-consolidated moderately vuggy aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial pale greenish-yellow (10Y 8/2) to very pale orange (10YR 8/2) massive trona. |
| 35.1 | .2 | Borax and halite. Well-consolidated aggregate of densely packed subhedral colorless to pale yellowish-borax crystals averaging 20 mm in length, with disseminated intermixed colorless halite cubes modified by octahedron, averaging 5 mm in length, along base. Borax 98 percent, halite 2 percent. |
| 35.4 | .3 | Halite and borax. Well-consolidated aggregate of colorless halite cubes modified by octahedron, averaging 5 mm in length, with a few disseminated subhedral borax crystals, averaging 20 mm in length, at top; trace of trona blades, averaging 5 mm in length, at base. Halite 99 percent, borax 1 percent. |
| 35.5 | .1 | Clay. Grayish-olive (10Y 4/2) to grayish olive-green (5GY 3/2) clay with pinhead discolorations of dark yellowish-orange (10YR 6/6) algae(?). |
| 35.6 | .1 | Halite and clay. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length; seam, 15 mm wide, of grayish-olive (10Y 4/2) to grayish olive-green (5GY 3/2) clay at base, containing a few disseminated sulfahalite octahedra averaging 5 mm in length. Halite 50 percent, clay 50 percent. |
| 35.9 | .3 | Halite. Friable aggregate of colorless halite cubes modified by octahedron, averaging 5 mm in length; trace of intermixed grayish-olive (10Y 4/2) to grayish olive-green (5GY 3/2) clay in lower 15 mm. |
| 36.1 | .2 | Halite and trona. Well-consolidated slightly vuggy granular aggregate of colorless halite crystals averaging 3 mm in length, with 10 percent interstitial very pale orange (10YR 8/2) to pale greenish-yellow (10Y 8/2) massive trona; scattered halite cubes modified by octahedron, in vugs. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 36.3 | 0.2 | Hanksite and clay. Fractured core. Densely packed aggregate of subhedral to euhedral hanksite crystals showing prominent basal pinacoids with 5 percent interstitial grayish olive-green (5GY 3/2) clay; a few loose sulfahalite octahedra up to 18 mm on edge; scattered loose subhedral borax crystals. |
| 36.4 | .1 | Halite and trona. Friable aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with 2 percent interstitial pale-olive (10Y 6/2) massive trona. |
| 37.3 | .9 | Halite, trona, and clay. Well-consolidated slightly vuggy granular aggregate of colorless halite crystals averaging 3 mm in length, with 10 percent interstitial white (N 9) to very pale orange (10YR 8/2) massive trona; lenticular horizontal vugs, averaging 3 mm in width, lined with halite cubes modified by octahedron, averaging 2 mm in length, from 36.7 to 36.9 ft; seam, 10-15 mm wide, of grayish olive-green (5GY 3/2) clay at base, containing 5 percent disseminated sulfahalite octahedra from 2 to 10 mm in length. Halite 85 percent, trona 10 percent, clay 5 percent. |
| 37.6 | .3 | Halite. Friable aggregate of colorless halite cubes and subhedra, averaging 5 mm in length. |
| 38.9 | .8 | Trona and halite. Well-consolidated slightly vuggy very pale orange (10YR 8/2) to grayish-orange (10YR 7/4) massive trona with horizontal seams and streaks 1-2 mm wide, of colorless halite; seam, 10 mm wide, of intermixed colorless trona blades averaging 5 mm in length, with light greenish-gray (5GY 8/1) massive trona at 38.2 ft. Trona 90 percent, halite 10 percent. |
| 39.0 | .1 | Borax and trona. Densely packed aggregate of colorless anhedral borax crystals averaging 20 mm in length, with 2 percent very pale orange (10YR 8/2) massive trona in ¼-in. pockets and thin streaks. |
| 39.1 | .1 | Trona. Very pale orange (10YR 8/2) to grayish-orange (10YR 8/4) compact massive trona. |
| 40.0 | .9 | Halite and trona. Well-consolidated moderately vuggy aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial very pale orange (10YR 8/2) to light greenish-gray (5GY 8/1) massive trona. |
| 40.3 | .3 | Trona and hanksite. Well-consolidated white (N 9) to light olive-gray (5Y 6/1) massive hard trona with 1 percent subhedral hanksite crystals averaging 20 mm in length at base. |
| 40.6 | .3 | Halite and trona. Well-consolidated moderately vuggy aggregate of colorless halite cubes modified by octahedron, averaging 2 mm in length, with 20 percent interstitial white (N 9) to very pale orange (10YR 8/2) to pale greenish-yellow (10Y 8/2) to light-gray (N 7) massive trona; lenticular horizontal seams, 2-3 mm wide, lined with halite cubes modified by octahedron. |
| 41.9 | 1.3 | No core. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 42. 4 | 0. 5 | Halite, trona, and clay. Well-consolidated slightly friable aggregate of colorless halite cubes and subhedra, averaging 3 mm in length, with 2 percent interstitial white (<i>N</i> 9) to very pale orange (10YR 8/2) to pale greenish-yellow (10Y 8/2) massive trona; seam, averaging 5 mm in width, of grayish olive-green (5GY 3/2) clay at 42.3 ft. |
| 42. 8 | . 4 | Trona, halite, and borax. Vuggy aggregate of white (<i>N</i> 9) to dusky-yellow (5Y 6/4) massive trona with intermixed colorless fine fibrous trona; 5 percent disseminated colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length; scattered streaks and pockets, up to 40 mm in length, of colorless anhedral borax. Trona 90 percent, halite 5 percent, borax 5 percent. |
| 43. 5 | . 7 | Halite and trona. Well-consolidated granular aggregate of colorless halite cubes with 10 percent interstitial white (<i>N</i> 9) to grayish-orange (10YR 7/4) massive trona. |
| 43. 6 | . 1 | Clay, pirssonite, and trona. Greenish-black (5GY 2/1) to grayish-black (<i>N</i> 2) to olive-gray (5Y 3/2) clay with 30 percent disseminated fine euhedral to subhedral pirssonite sand; seam, 5 mm wide, of fine colorless fibrous trona at base; disseminated flat rounded pebbles, averaging 10 mm in length, of white (<i>N</i> 9) hard massive trona in lower 15 mm; a few sulfohalite octahedra averaging 5 mm in length; clay contains distinct moderate reddish-brown (10R 4/6) algae(?) discolored laminae and pinpoint spots of dark yellowish-orange (10YR 6/6) algae(?) throughout. Clay 65 percent, pirssonite 30 percent, trona 5 percent. |
| 43. 8 | . 2 | Halite. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length. |
| 44. 1 | . 3 | Halite, hanksite, and clay. Well-consolidated aggregate of colorless halite cubes and anhedral, averaging 4 mm in length, with 5 percent grayish olive-green (5GY 3/2) clay in streaks and pockets; 15 percent disseminated anhedral smoky hanksite crystals from 10 to 40 mm in length. |
| 45. 8 | 1. 7 | No core. |
| 46. 1 | . 3 | Hanksite, halite and clay. Well-consolidated aggregate of smoky subhedral hanksite crystals up to 50 mm in length, with interstitial colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length, and grayish olive-green (5GY 3/2) to olive-gray (5Y 3/2) clay containing pinpoint spots of moderate reddish-brown (10R 4/6) algae. Hanksite 60 percent, halite 35 percent, clay 5 percent. |
| 46. 4 | . 3 | Trona and hanksite. Poorly consolidated core. Fragments of round very pale orange (10YR 8/2) hard massive trona with soft light olive-gray (5Y 6/1) massive trona; disseminated subhedral to euhedral colorless to smoky hanksite crystals from 10 to 50 mm in length; single sulfohalite octahedron, 8 mm in length, noted. Trona 80 percent, hanksite 20 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 46.6 | 0.2 | Halite and trona. Well-consolidated aggregate of colorless: halite crystals averaging 3 mm in length, with 40 percent interstitial white (<i>N</i> 9) to very pale orange (10YR 8/2) massive trona; single sulfohalite octahedron at top. |
| 46.8 | .2 | Trona, hanksite, and clay. White (<i>N</i> 9) to light greenish-gray (5GY 8/1) slightly vuggy massive trona with lenticular horizontal vugs and pockets of fine colorless fibrous trona. Intermixed with olive-gray (5Y 3/2) clay containing scattered pinpoint spots of moderate reddish-brown (10R 4/6) algae(?); euhedral smoky hanksite crystals, averaging 15 mm in length, disseminated throughout but chiefly confined to base. Trona 60 percent, hanksite 39 percent, clay 1 percent. |
| 47.3 | .5 | No core. |
| 48.1 | .8 | Halite and trona. Well-consolidated vuggy aggregate of colorless halite cubes averaging 3 mm in length, with 40 percent interstitial white (<i>N</i> 9) to very pale orange (10YR 8/2) massive trona; horizontal lenticular vugs, up to 5 mm in width, lined with colorless to white (<i>N</i> 9) halite cubes; trace of intermixed greenish-black (5GY 2/1) clay in lenticular horizontal pocket at 47.7 ft. |
| 48.3 | .2 | Trona and halite. Fractured core. Very pale orange (10YR 8/2) to grayish-yellow (5Y 8/4) to pale greenish-yellow (10Y 8/2) massive trona with 20 percent disseminated colorless halite crystals averaging 2 mm in length; a few narrow horizontal lenticular vugs. |
| 48.6 | .3 | Trona and halite. Well-consolidated very pale orange (10YR 8/2) to pale greenish-yellow (10Y 8/2) massive trona with 40 percent disseminated colorless halite crystals; a few sulfohalite octahedra at base, with trace of intermixed grayish-olive (10Y 4/2) clay. |
| 49.1 | .5 | Halite and trona. Well-consolidated aggregate of colorless halite cubes averaging 3 mm in length, with seam, 5 mm wide, of grayish-yellow (5Y 8/4) to pale greenish-yellow (10Y 8/2) massive trona at 48.9 ft; trace of interstitial white (<i>N</i> 9) to grayish-yellow (5Y 8/4) trona in lower 0.2 ft. Halite 97 percent, trona 3 percent. |
| 49.6 | .5 | Halite, hanksite, borax, and clay. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with seam of anhedral colorless borax crystals, averaging 20 mm in length, at top; 1 percent interstitial grayish olive-green (5GY 3/2) clay in upper 0.3 ft; large disseminated anhedral to subhedral smoky hanksite crystals up to 60 mm in length. Halite 57 percent, hanksite 29 percent, borax 13 percent, clay 1 percent. |
| 50.1 | .5 | Halite, trona, and hanksite. Well-consolidated vuggy aggregate of colorless halite cubes modified by octahedron and cubes, averaging 3 mm in length, with 35 percent interstitial white (<i>N</i> 9) to grayish-yellow (5Y 8/4) massive trona containing traces of fine colorless fibrous trona; large colorless halite cubes modified by octahedron, averaging 10 mm in |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| | | length, at base, with anhedral to subhedral smoky hanksite in lower 0.1 ft. Halite 62 percent, trona 35 percent, hanksite 3 percent. |
| 50.3 | 0.2 | Halite and trona. Fractured core. Fragments of well-consolidated vuggy aggregates of colorless halite cubes modified by octahedron, up to 10 mm in length, averaging 5 mm, with 1 percent interstitial white (N 9) to very pale orange (10YR 8/2) massive trona. |
| 51.3 | 1.0 | No core. |
| 51.5 | .2 | Halite and trona. Fractured core. Fragments of well-consolidated aggregates of colorless halite cubes modified by octahedron and anhedral, averaging 2 mm in length, with 5 percent interstitial white (N 9) to very pale orange (10YR 8/2) massive trona. |
| 52.1 | .6 | Halite and trona. Well-consolidated vuggy aggregate of colorless halite cubes modified by octahedron, up to 20 mm in length, averaging 5 mm, with 20 percent white (N 9) to very pale orange (10YR 8/2) to grayish-yellow (5Y 8/4) massive trona in seams and interstices. |
| 52.4 | .3 | Trona and halite. Poorly consolidated core. Grayish-yellow (5Y 8/4) to very pale orange (10YR 8/2) massive soft vuggy trona with 20 percent disseminated colorless halite cubes modified by octahedron and subhedra, averaging 5 mm in length. |
| 52.6 | .2 | Trona and halite. Well-consolidated very pale orange (10YR 8/2) to moderate orange-pink (5YR 8/4) soft massive trona with 20 percent colorless halite cubes and subhedra, averaging 2 mm in length, in seams 1 to 5 mm wide. |
| 53.1 | .5 | No core. |
| 53.5 | .4 | Halite and trona. Well-consolidated slightly vuggy aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length, with 10 percent interstitial white (N 9) to very pale orange (10YR 8/2) massive trona; trace of colorless apthitalite (glaserite) blades, averaging 5 mm in length, in 1-in. pockets; a few narrow lenticular horizontal vugs 1 to 2 mm wide. |
| 53.6 | .1 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron and cubes, with 10 percent interstitial white (N 9) to grayish-orange (10YR 7/4) massive trona. |
| 53.7 | .1 | Halite and apthitalite. Vuggy aggregate of intermixed colorless halite cubes modified by octahedron, averaging 5 mm in length, with colorless apthitalite (glaserite) blades averaging 10 mm in length. Halite 75 percent, apthitalite 25 percent. |
| 54.2 | .5 | Trona and halite. Fractured core. Fragments of well-consolidated slightly vuggy massive very pale orange (10YR 8/2) to yellowish-gray (5Y 7/2) trona with scattered pockets, averaging 25 mm in length, of colorless halite cubes modified by octahedron, averaging 3 mm in length; trace of colorless apthitalite (glaserite) blades, averaging 2 mm in length, lining vugs. Trona 98 percent, halite 2 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 55.4 | 1.2 | Trona and halite. Well-consolidated very pale orange (10YR 8/2) to grayish-orange (10R 7/4) to white (N 9) massive trona with 40 percent colorless halite cubes modified by octahedron and subhedra, averaging 3 mm in length, in horizontal seams, up to 10 mm wide, and disseminated throughout. |
| 55.8 | .4 | Halite and trona. Well-consolidated moderately friable aggregate of colorless halite cubes averaging 3 mm in length, with 5 percent interstitial white (N 9) to pale greenish-yellow (10Y 8/2) massive trona. |
| 56.1 | .3 | Halite and trona. Fractured and poorly consolidated core. Colorless to white (N 8) halite sand with fragments of well-consolidated aggregates of colorless halite cubes modified by octahedron, averaging 3 mm in length, containing 5 percent interstitial white (N 9) massive trona; trace of grayish olive-green (5GY 3/2) clay in thin seam 5 mm wide, fragments consisting of aggregates of subhedral colorless halite crystals averaging 20 mm in length. Probably cuttings, not core. |
| 56.4 | .3 | Trona and halite. Well-consolidated white (N 9) to very pale orange (10YR 8/2) to moderate orange-pink (5YR 8/4) massive trona with 10 percent disseminated colorless halite cubes modified by octahedron, averaging 2 mm in length, in slightly vuggy seams 1 to 5 mm wide. |
| 56.8 | .4 | Halite and trona. Well-consolidated slightly vuggy aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial white (N 9) to very pale orange (10YR 8/2) massive trona. |
| 57.1 | .3 | Trona and halite. Well-consolidated white (N 9) to very pale orange (10YR 8/2) slightly vuggy massive trona with 40 percent disseminated colorless halite cubes modified by octahedron, averaging 3 mm in length; vugs contain colorless halite cubes modified by octahedron up to 9 mm in length. |
| 58.2 | 1.1 | No core. |
| 58.7 | .5 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with trace of interstitial white (N 9) massive trona; seam, 5 mm wide, of very pale orange (10YR 8/2) to pale greenish-yellow (10Y 8/2) massive trona at top. Halite 97 percent, trona 3 percent. |
| 58.8 | .1 | Trona and halite. White (N 9) to pale greenish-yellow (10Y 8/2) massive trona with 10 percent disseminated colorless halite cubes and cubes modified by octahedron, averaging 5 mm in length. |
| 59.2 | .4 | Halite. Well-consolidated dense aggregate of colorless halite crystals, averaging 3 mm in length, with trace of interstitial very pale orange (10YR 8/2) massive trona. |
| 59.8 | .6 | Halite and trona. Well-consolidated aggregate of colorless halite crystals, averaging 2 mm in length, with 10 percent interstitial very pale orange (10YR 8/2) massive trona. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 59.9 | 0.1 | Halite and trona. Fractured core. Fragments of well-consolidated aggregates of colorless halite cubes modified by octahedron, averaging 5 mm in length, with 15 percent interstitial very pale orange (10YR 8/2) massive trona. |
| 60.0 | .1 | Trona. Irregular seam, varying from 10 to 40 mm in width, of very pale orange (10YR 8/2) compact massive trona. |
| 60.2 | .2 | Trona and halite. Well-consolidated white (N 9) to yellowish-gray (5Y 7/2) to grayish-yellow (5Y 8/4) massive trona, with seam of 10 percent disseminated colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length, in lower 0.1 ft; trace of olive-gray (5Y 3/2) clay in thin irregular discontinuous seams or streaks, 2 mm wide, throughout. |
| 61.1 | .9 | No core. |
| 62.0 | .9 | Halite, trona, and clay. Well-consolidated aggregate of colorless halite cubes averaging 2 mm in length, with 5 percent interstitial colorless fibrous trona; seam, 5 mm wide, of 90 percent colorless to light-gray (N 7) massive trona at 61.6 ft; trace of grayish-black (N 2) to grayish olive-green (5GY 3/2) clay in wavy seams 2 mm wide. Halite 93 percent, trona 7 percent. |
| 62.3 | .3 | Halite and trona. Poorly consolidated aggregate of halite cubes modified by octahedron, averaging 3 mm in length, with 5 percent interstitial white (N 9) massive trona; fragments of white (N 9) to yellowish-gray (5Y 8/1) massive trona containing traces of intermixed greenish-black (5GY 2/1) clay. Halite 80 percent, trona 20 percent. |
| 62.7 | .4 | Trona. Well-consolidated compact white (N 9) to very pale orange (10YR 8/2) fine fibrous trona. |
| 63.0 | .3 | Trona. Yellowish-gray (5Y 8/1) soft massive trona discolored light olive-gray (5Y 3/2) by trace of intermixed clay in lower 0.1 ft; a few 1-in. pockets of white (N 9) to colorless fine fibrous trona in lower 0.1 ft. |
| 64.0 | 1.0 | No core. |
| 64.6 | .6 | Trona. Poorly consolidated soft light greenish-gray (5GY 8/1) to yellowish-gray (5Y 8/1) massive trona; loose fragments of well-consolidated dense vuggy light olive-gray (5Y 3/2) massive trona, with vugs lined with colorless fibrous trona. |
| 64.8 | .2 | Trona. Yellowish-gray (5Y 8/1) soft massive trona. |
| 64.9 | .1 | Halite and trona. Irregular seam, up to 0.2 ft wide, of well-consolidated halite crystals with 50 percent interstitial yellowish-gray (5Y 8/1) massive trona. |
| 65.6 | .7 | Trona. Fractured core. Fragments of yellowish-gray (5Y 7/2) to very pale orange (10YR 8/2) to moderate yellowish-brown (10YR 5/4) soft massive trona with seams and included fragments of well-consolidated white (N 9) to moderate yellowish-brown (10YR 5/4) dense hard massive trona. |
| 65.7 | .1 | Trona. Well-consolidated white (N 9) massive trona with seam, 10 mm wide, of pale yellowish-brown (10YR 6/2) massive trona. |
| 67.6 | 1.9 | No core. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 68.4 | 0.8 | Trona. Poorly consolidated white (<i>N</i> 9) to light greenish-gray (5GY 8/1) to yellowish-gray (5Y 8/1) soft massive trona. May be cuttings, not core. |
| 69.2 | .8 | No core. |
| 69.7 | .5 | Trona. Well-consolidated white (<i>N</i> 9) to yellowish-gray (5Y 8/1) to dark greenish-gray (5GY 4/1) compact massive trona; trace of moderate olive-brown (5Y 4/4) to grayish-olive (10Y 4/2) clay in thin streak, 1 mm wide, in upper 0.1 ft; a few discontinuous lenticular horizontal seams, 2 mm wide, filled with colorless subhedral halite crystals in lower 0.2 ft. |
| 69.9 | .2 | Trona. Fractured core. Grayish-black (<i>N</i> 2) to dark gray (<i>N</i> 3) to dusky yellow (5Y 6/4) to very pale orange (10YR 8/2) dense hard massive trona. |
| 70.2 | .3 | Trona and borax. Dark gray (<i>N</i> 3) to yellowish-gray (5Y 8/1) vuggy massive trona with discontinuous seams and pockets of anhedral to subhedral colorless borax. Trona 75 percent, borax 25 percent. |
| 70.4 | .2 | Trona. White (<i>N</i> 9) soft massive trona with very faint seams, 2 to 3 mm wide, of very pale orange (10YR 8/2) trona revealed by color differences; seam, 5 mm wide, of grayish-black (<i>N</i> 2) dense hard massive trona at base. |
| 70.6 | .2 | Borax and trona. Well-consolidated densely packed aggregates of colorless to smoky anhedral to subhedral borax crystals averaging 20 mm in length, with discontinuous seam, 5 mm wide, of yellowish-gray (5Y 8/1) massive trona at 70.5 ft; trace of intermixed greenish-black (5GY 2/1) clay in lower 0.1 ft. Borax 96 percent, trona 4 percent. |
| 70.9 | .3 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) clay with 30 percent disseminated anhedral to subhedral gaylussite crystals averaging 5 mm in length. |
| 71.1 | .2 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to olive-gray (5Y 3/2) to dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) to grayish-yellow (5Y 8/4) to light olive-brown (5Y 5/6) faintly finely laminated clay with seams up to 5 mm wide and irregular streaks in upper 0.1 ft containing disseminated euhedral gaylussite sand with lesser amounts of intermixed euhedral gaylussite crystals 1 to 2 mm in length. Clay 80 percent, gaylussite 20 percent. |
| 71.7 | .6 | Clay. Grayish-green (5G 5/2) to dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) to grayish-black (<i>N</i> 2) to light olive-brown (5Y 5/6) finely laminated clay; seam, 5 mm wide, of 20 percent intermixed euhedral gaylussite sand at 71.2 ft. |
| 71.9 | .2 | Clay and gaylussite. Olive-gray (5Y 3/2) to grayish olive-green (5GY 3/2) to grayish-black (<i>N</i> 2) clay with 50 percent disseminated anhedral gaylussite crystals; locally finely laminated grayish-yellow (5Y 8/4) to moderate orange-pink (5YR 8/4) to pale greenish-yellow (10Y 8/2) to grayish-olive (10Y 4/2) to very light gray (<i>N</i> 8) clay without gaylussite crystals. Clay 75 percent, gaylussite 25 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 73.5 | 1.6 | Clay. Greenish-black (5GY 2/1) to grayish-black (N 2) to dusky yellow-green (5GY 5/2) to olive-gray (5Y 3/2) to greenish-yellow (10Y 8/2) to light olive-brown (5Y 5/6) to very light gray (N 8) finely laminated clay. |
| 74.2 | .7 | Clay. Black (N 1) to greenish-black (5GY 2/1) to grayish olive-green (5GY 3/2) to olive-gray (5Y 3/2) coarsely laminated clay revealed by color differences. |
| 75.3 | 1.1 | Clay and aragonite**. Grayish-black (N 2) to greenish-black (5GY 2/1) to grayish olive-green (5GY 3/2) clay coarsely laminated with laminae, 1 to 2 mm wide, of very light gray (N 8) to light greenish-gray (5G 8/1) finely crystalline massive aragonite**. Clay 95 percent, aragonite 5 percent. |
| 75.8 | .5 | Clay. Fractured core. Fragments of black (N 1) to greenish-black (5GY 2/1) to grayish-yellow (5Y 8/4) to dusky yellow-green (5GY 5/2) to very light gray (N 8) fine to coarsely laminated clay. Probably cuttings, not core. |
| 77.0 | 1.2 | Clay. Greenish-black (5GY 2/1) to grayish-black (N 2) to brownish-black (5YR 2/1) to dusky yellow-green (5GY 5/2) to pale olive (10Y 6/2) to grayish-yellow (5Y 8/4) to pale yellowish-orange (10YR 8/6) to very light gray (N 8) finely laminated clay. |
| 77.7 | .7 | Clay. Dusky yellow-green (5GY 5/2) to grayish-olive (10Y 4/2) to grayish-black (N 2) to grayish-yellow (5Y 8/4) to pale greenish-yellow (10Y 8/2) to pale yellowish-orange (10YR 8/6) finely laminated clay. |
| 78.0 | .3 | Clay and aragonite**. Greenish-black (5GY 2/1) to grayish-black (N 2) clay with grayish-yellow (5Y 8/4) to pale greenish-yellow (10Y 8/2) to light greenish-gray (5G 8/1) laminae, averaging 1 mm wide, of soft massive finely crystalline aragonite**. Clay 95 percent, aragonite 5 percent. |
| 78.1 | .1 | Clay. Greenish-black (5GY 2/1) to grayish-black (N 2) to grayish-yellow (5Y 8/4) to pale olive (10Y 6/2) to very light gray (N 8) finely laminated clay, with laminae wavy and crenulated. |
| 78.3 | .2 | Clay. Grayish-black (N 2) to dark yellowish-orange (10YR 6/6) to pale olive (10Y 6/2) to dusky yellow-green (5GY 5/2) to grayish-yellow (5Y 8/4) finely laminated clay. |
| 78.5 | .2 | Clay and aragonite. Grayish-black (N 2) to greenish-black (5GY 2/1) clay with light greenish-gray (5GY 8/1) to grayish-yellow (5Y 8/4) laminae, averaging 1 mm wide of soft massive finely crystalline aragonite. Clay 95 percent, aragonite 5 percent. |
| 78.7 | .2 | Clay and gaylussite. Grayish-black (N 2) to greenish-black (5GY 2/1) to olive-black (5Y 2/1) to pale greenish-yellow (10Y 8/2) to dusky yellow-green (5GY 5/2) to dark yellowish-orange (10YR 6/6) to grayish-yellow (5Y 8/4) moderately coarsely laminated clay; 1 pocket, 25 mm in length, of disseminated subhedral dark brittle gaylussite crystals. Clay 95 percent, gaylussite 5 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 79.1 | 0.4 | Clay. Grayish olive-green (5GY 3/2) to dusky yellow-green (5GY 5/2) to grayish-olive (10Y 4/2) to light bluish-gray (5B 7/1) to medium bluish-gray (5B 5/1) coarsely laminated clay, laminae revealed by color differences, with irregular small streaks, less than 1 mm long, of moderate reddish-orange (10R 6/6) algae(?) confined to bluish clay seams at 78.9 and 79.1 ft. |
| 79.2 | .1 | Clay. Grayish-black (N 2) clay with spots and thin streaks of moderate reddish-brown (10R 4/6) algae(?)-discolored clay. |
| 79.4 | .2 | Clay and gaylussite. Grayish-black (N 2) clay with algae(?) -discolorations as above, with seam, 5 mm wide, of dusky yellow-green (5GY 5/2) clay at base; 50 percent disseminated subhedral gaylussite crystals averaging 5 mm in length. |
| 80.3 | .9 | Clay and gaylussite. Grayish-black (N 2) to dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) to medium bluish-gray (5B 5/1) coarsely laminated clay revealed by color differences, with 30 percent disseminated euhedral gaylussite crystals, averaging 1 mm in length, in lower 0.5 ft; a few seams of disseminated subhedral to anhedral gaylussite crystals, averaging 3 mm in length, in upper 0.4 ft; moderate reddish-brown (10R 4/6) algae(?) discolorations in clay in upper 10 mm, in seam, 1 mm wide, at 80.1 ft, and vague discolorations in lower 0.1 ft. Clay 70 percent, gaylussite 30 percent. |
| 80.6 | .3 | Clay. Grayish-black (N 2) to greenish-gray (5G 6/1) coarsely laminated clay revealed by color differences. |
| 81.0 | .4 | Clay and gaylussite. Grayish-black (N 2) clay with 10 percent disseminated very fine gaylussite silt; seam, 10 mm wide, of 50 percent disseminated euhedral gaylussite crystals, averaging 1 mm in length, at 80.8 ft; moderate reddish-brown (10R 4/6) algae(?) discolorations locally present. Clay 86 percent, gaylussite 14 percent. |
| 81.1 | .1 | Clay. Grayish-black (N 2) to dusky yellow-green (5GY 5/2) clay. |
| 81.3 | .2 | Trona and borax. Well-consolidated white (N 9) to light greenish-gray (5G 8/1) dense massive trona with disseminated colorless trona blades averaging 10 mm in length; euhedral to subhedral colorless borax crystals from 2 to 10 mm in length, averaging 5 mm, at top. Trona 98 percent, borax 2 percent. |
| 81.4 | .1 | Halite and trona. Well-consolidated dense aggregate of colorless halite crystals with 20 percent interstitial white (N 9) massive trona conspicuously discolored moderate reddish-brown (10R 4/6) to light-brown (5YR 5/6) by intermixed algae(?). |
| 82.1 | .7 | Clay, gaylussite, and borax. Black (N 1) to moderate olive-brown (5Y 4/4) to greenish-black (5GY 2/1) coarsely laminated clay, revealed by color differences, with 40 percent |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| | | disseminated euhedral gaylussite crystals averaging 1 mm in length; 5 percent disseminated euhedral borax crystals up to 20 mm in length; numerous seams and discolorations of moderate reddish-brown (10R 4/6) algae(?) in lower 0.5 ft. |
| 82.4 | 0.3 | Clay and borax. Greenish-black (5GY 2/1) to grayish-black (N 2) to grayish olive-green (5GY 3/2) faintly coarsely laminated clay, revealed by color differences, with disseminated yellowish euhedral borax crystals from 5 to 20 mm in length, averaging 10 mm. Clay 75 percent, borax 25 percent. |
| 82.6 | .2 | Clay and pirssonite. Black (N 1) clay with 40 percent disseminated euhedral pirssonite crystals averaging 1 mm in length. |
| 82.8 | .2 | Clay, borax, and pirssonite. Black (N 1) to greenish-black (5GY 2/1) to medium bluish-gray (5G 5/1) clay with 10 percent disseminated euhedral pirssonite crystals averaging ½ mm in length; 35 percent disseminated euhedral borax crystals up to 30 mm in length, averaging 10 mm; some inclusions of moderate reddish-brown (10R 4/6) algae(?) in borax, clay, and pirssonite. |
| 83.5 | .7 | Trona. Well-consolidated yellowish-gray (5Y 8/1) to very pale orange (10YR 8/2) to greenish-gray (5GY 6/1) massive trona with numerous intermixed pockets and streaks of colorless to grayish-yellow (5Y 8/4) fibrous trona associated with a few sulfahalite octahedra averaging 3 mm in length. |
| 83.7 | .2 | No core. |
| 84.7 | 1.0 | Trona. Well-consolidated slightly vuggy yellowish-gray (5Y 8/1) to greenish-gray (5GY 6/1) massive trona with numerous irregular pockets and streaks of colorless to yellowish-gray (5Y 8/1) fibrous trona. |
| 85.2 | .5 | Trona. Fractured core. Fragments of medium-gray (N 5) to yellowish-gray (5Y 8/1) vuggy massive trona with numerous irregular pockets and streaks of colorless to yellowish-gray (5Y 8/1) fibrous and bladed trona, blades averaging 5 mm in length; a few sulfahalite octahedra, averaging 2 mm in length, in vugs with fibrous and bladed trona. Traces of moderate reddish-orange (10R 6/6) algae(?). |
| 85.9 | .7 | Trona and halite. Well-consolidated very light gray (N 8) to yellowish-gray (5Y 8/1) vuggy massive trona with 40 percent disseminated colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length; trace of colorless to grayish-yellow (5Y 8/4) fine fibrous trona in lenticular horizontal vugs with halite cubes modified by octahedron. |
| 86.0 | .1 | Halite. Well-consolidated aggregate of colorless halite cubes modified by octahedron, up to 20 mm in length, averaging 10 mm. |
| 86.8 | .8 | No core. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 87.7 | 0.9 | Halite and trona. Moderately friable vuggy aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with 1 percent colorless to grayish-yellow (5Y 8/4) fibrous trona in ½-in. pockets disseminated throughout; trace of medium-gray (N 5) clay intermixed with trona in seam, 5 mm wide at 87.2 ft. |
| 87.8 | .1 | Trona and halite. Well-consolidated soft white (N 9) massive trona with 25 percent disseminated colorless halite crystals. |
| 88.3 | .5 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with trace of interstitial fine colorless fibrous trona; seam, 5 mm wide, of fine colorless fibrous trona with distinct local discolorations of light-brown (5YR 5/6) algae(?) at 88.2 ft; local traces of intermixed grayish-black (N 2) clay. Halite 97 percent, trona 3 percent. |
| 88.5 | .2 | Trona, clay, pirssonite, and halite. Well-consolidated vuggy aggregate of colorless to grayish-yellow (5Y 8/4) trona blades, averaging 10 mm in length, with ½-in. pockets of medium-gray (N 5) massive trona; seam, 10 mm wide, of black (N 1) to grayish-olive (10Y 4/2) clay containing 40 percent disseminated euhedral pirssonite crystals, averaging 1 mm in length, at top; clay also containing local discolorations of moderate reddish-brown (10R 4/6) algae(?); scattered colorless halite cubes modified by octahedron, averaging 5 mm in length, at base of clay seam. Trona 82 percent, clay 10 percent, pirssonite 7 percent, halite 1 percent. |
| 88.6 | .1 | Halite. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with scattered ½-in. pockets of fine colorless fibrous trona. |
| 88.8 | .2 | Trona and halite. Well-consolidated white (N 9) to yellowish-gray (5Y 8/1) to grayish-yellow (5Y 8/4) soft vuggy massive trona with 20 percent disseminated colorless halite cubes modified by octahedron, averaging 3 mm in length. |
| 89.1 | .3 | Clay and pirssonite. Well-consolidated black (N 1) to grayish-black (N 2) clay, locally faintly finely laminated, with seam, 10–20 mm wide, of 50 percent disseminated euhedral pirssonite crystals averaging 1.5 mm in length at top. Clay 92 percent, pirssonite 8 percent. |
| 90.4 | 1.3 | Clay and pirssonite. Well-consolidated black (N 1) to dark yellowish-orange (10YR 6/6) to moderate olive-brown (5Y 4/4) clay with 30 percent disseminated euhedral pirssonite crystals averaging 5 mm in length; distinct moderate reddish-brown (10R 4/6) algae(?) discolored seam 5 mm wide at base. |
| 90.9 | .5 | Clay and pirssonite. Poorly consolidated and fractured core. Black (N 1) to dark yellowish-orange (10YR 6/6) to moderate olive-brown (5Y 4/4) clay with 30 percent disseminated euhedral pirssonite crystals averaging 5 mm in length. |
| 91.4 | .5 | No core. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 91. 6 | 0. 2 | Clay and pirssonite. Well-consolidated black (N 1) clay with 20 percent disseminated euhedral pirssonite silt and fine sand. |
| 92. 3 | . 7 | Trona and clay. Well-consolidated colorless to white (N 9) to grayish-yellow (5Y 8/4) fine fibrous trona discolored dark-gray (N 3) by 2 percent intermixed clay. |
| 92. 6 | . 3 | No core. |
| 93. 1 | . 5 | Halite and trona. Well-consolidated slightly vuggy aggregate of colorless halite cubes modified by octahedron, averaging 3 mm in length, with 10 percent interstitial white (N 9) to yellowish-gray (5Y 8/1) massive trona; core fractured in upper 0.1 ft. |
| 93. 3 | . 2 | Trona and halite. Well-consolidated medium light-gray (N 6) to medium-gray (N 5) massive trona with seams, 5 mm wide, of disseminated colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length. Trona 75 percent, halite 25 percent. |
| 93. 6 | . 3 | Halite and trona. Well-consolidated slightly friable aggregate of colorless halite cubes modified by octahedron averaging 2 mm in length, with 5 percent interstitial white (N 9) to medium light-gray (N 6) massive trona. |
| 94. 6 | 1. 0 | Trona and halite. Well-consolidated moderately vuggy white (N 9) to medium-gray (N 5) massive trona with seams, pockets, and irregular streaks, averaging 5 mm in width, of colorless halite cubes modified by octahedron averaging 5 mm in length; vague seams of light-brown (5YR 5/6) intermixed algae(?) in lower 0.1 ft. Trona 90 percent, halite 10 percent. |
| 95. 1 | . 5 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron averaging 3 mm in length, with 30 percent interstitial white (N 9) to light olive-gray (5Y 6/1) massive trona; scattered ½-in. pockets of white (N 9) to colorless fine fibrous trona in lower 0.2 ft. |
| 95. 2 | . 1 | Trona. Well-consolidated light-gray (N 7) to dark greenish-gray (5GY 4/1) massive trona with vague irregular seams of intermixed moderate reddish-brown (10R 4/6) algae(?). |
| 95. 7 | . 5 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron averaging 2 mm in length, with 30 percent interstitial white (N 9) to yellowish-gray (5Y 8/1) massive trona. |
| 96. 0 | . 3 | Trona and halite. Well-consolidated medium light-gray (N 6) to yellowish-gray (5Y 8/1) to pale-olive (10Y 6/2) massive trona, with seam of disseminated intermixed colorless halite cubes modified by octahedron averaging, 3 mm in length at 96.1 ft. and a few disseminated halite crystals to base; distinct discolorations, 5 mm wide, of intermixed moderate reddish-brown (10R 4/6) algae(?) at 96.1 ft. Trona 90 percent, halite 10 percent. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 96.2 | 0.2 | Trona. Well-consolidated white (<i>N</i> 9) to yellowish-gray (5Y 8/1) soft fine fibrous trona with ½-in. pockets of medium dark-gray (<i>N</i> 4) massive trona; moderate orange-pink (5YR 8/4) to grayish-orange (10YR 7/4) algae(?) discolorations. |
| 96.5 | .3 | Trona. Poorly consolidated and fractured core. Fragments of white (<i>N</i> 9) to greenish-gray (5GY 6/1) to medium dark-gray (<i>N</i> 4) soft massive to fine fibrous trona; trace of intermixed grayish-black (<i>N</i> 2) clay; local light-brown (5YR 6/4) algae(?) discolorations. |
| 97.1 | .6 | No core. |
| 97.3 | .2 | Clay, pirssonite, and borax. Black (<i>N</i> 1) to light olive-brown (5Y 5/6) to pale-olive (10Y 6/2) clay with 30 percent disseminated euhedral pirssonite crystals averaging 7 mm in length, with 10 percent disseminated subhedral to euhedral borax crystals 15–40 mm in length. |
| 99.4 | 2.1 | Clay, pirssonite, and borax. Black (<i>N</i> 1) to light olive-brown 5Y 5/6) to dusky yellow-green (5GY 5/2) clay with 30 percent disseminated euhedral pirssonite crystals averaging 10 mm in length; a few disseminated euhedral to subhedral borax crystals, averaging 15 mm in length, in lower 0.2 ft; closely spaced pliable thin seams of organic? matter from 99.1 to 99.2 ft. Clay 69 percent, pirssonite 30 percent, borax 1 percent. |
| 99.6 | .2 | Clay and pirssonite. Well-consolidated black (<i>N</i> 1) clay with 40 percent disseminated euhedral pirssonite sand. |
| 99.7 | .1 | Borax. Friable aggregate of euhedral to subhedral borax crystals up to 15 mm in length, averaging 4 mm. |
| 100.1 | .4 | Halite, clay, and trona. Friable aggregate of colorless halite cubes modified by octahedron, averaging 2 mm in length, with 1 percent interstitial grayish-yellow (5Y 8/4) massive trona; seam, 5 mm wide, of interstitial black (<i>N</i> 1) clay at top. Halite 97 percent, clay 2 percent, trona 1 percent. |
| 100.3 | .2 | Halite and trona. Friable aggregate of colorless halite cubes modified by octahedron, averaging 2 mm in length, with irregular streaks and pockets of colorless to grayish-yellow (5Y 8/4) to dark-gray (<i>N</i> 3) fine fibrous trona, locally mixed with white (<i>N</i> 9) massive trona. Halite 95 percent, trona 5 percent. |
| 100.6 | .3 | Trona. Well-consolidated white (<i>N</i> 9) to dark-gray (<i>N</i> 3) massive trona with seam, 10 mm wide, of colorless to grayish-yellow (5Y 8/4) fibrous trona at 100.4 ft, locally intermixed with grayish-black (<i>N</i> 2) clay. |
| 100.7 | .1 | Trona. Well-consolidated colorless to grayish-yellow (5Y 8/4) fibrous trona, locally discolored dark-gray (<i>N</i> 3) by trace of intermixed clay. |
| 101.1 | .4 | Halite. Poorly consolidated and fractured core. Friable aggregate of colorless halite cubes and cubes modified by octahedron, averaging 5 mm in length, with trace of interstitial white (<i>N</i> 9) to grayish-yellow (5Y 8/4) massive trona; trace of grayish-black (<i>N</i> 2) clay locally in thin streaks. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 101.9 | 0.8 | No core. |
| 102.3 | .4 | Halite. Friable aggregate of colorless halite cubes and subhedra, averaging 3 mm in length, with trace of interstitial colorless fibrous trona. |
| 102.7 | .4 | Trona and clay. Well-consolidated white (N 9) to yellowish-gray (5Y 8/1) to dark greenish-gray (5GY 4/1) massive trona with irregular seam at top, averaging 5 mm in width, of grayish-black (N 2) clay containing 10 percent disseminated euhedral pirssonite crystals averaging 3 mm in length; thin seams, 1 mm wide, of intermixed grayish-black (N 2) clay in trona in upper 0.1 ft. Trona 95 percent, clay 5 percent. |
| 103.3 | .6 | Halite and trona. Friable aggregate of colorless halite cubes and subhedra averaging 2 mm in length; seam, 10 mm wide, of white (N 9) to pale-olive (10Y 6/2) massive trona with disseminated colorless trona blades averaging 10 mm in length, at 103.1 ft. Halite 94 percent, trona 6 percent. |
| 103.6 | .3 | Burkeite, trona, and halite. Dusky-yellow (5Y 6/4) vuggy dense hard massive burkeite with pockets containing colorless trona blades averaging 10 mm in length and a few colorless halite cubes modified by octahedron, up to 20 mm in length, averaging 7 mm; trace of intermixed dark-gray (N 3) clay with trona blades in lower 0.2 ft. Burkeite 84 percent, trona 15 percent, halite 1 percent. |
| 103.7 | .1 | Trona, clay, and pirssonite. Aggregate of trona blades averaging 5 mm in length, with seam, 10 mm wide, at top of black (N 1) clay containing 30 percent disseminated euhedral pirssonite crystals averaging ½ mm in length, clay locally discolored moderate reddish-brown (10YR 4/6) by algae(?). Trona 67 percent, clay 23 percent, pirssonite 10 percent. |
| 104.2 | .2 | Trona, burkeite, and halite. Well-consolidated white (N 9) to medium light-gray (N 6) to colorless slightly vuggy fibrous trona with irregular pockets and streaks of grayish yellow (5Y 8/4) hard dense massive burkeite; a few disseminated colorless halite cubes modified by octahedron, averaging 5 mm in length. Trona 94 percent, burkeite 5 percent, halite 1 percent. |
| 104.4 | .2 | Halite and trona. Well-consolidated vuggy aggregate of colorless halite cubes modified by octahedron, from 2 to 30 mm in length, averaging 10 mm, intermixed with coarse colorless trona blades averaging 10 mm in length and fine colorless grayish-yellow (5Y 8/4) fibrous trona. Halite 50 percent, trona 50 percent. |
| 104.5 | .1 | Trona and halite. Well-consolidated white (N 9) to light-gray (N 7) dense massive trona with irregular seam, up to 10 mm in width at base, of intermixed colorless trona blades and halite cubes modified by octahedron. Trona 99 percent, halite 1 percent. |
| 104.9 | .4 | Burkeite. Well-consolidated grayish-orange (10YR 7/4) dense hard slightly vuggy massive burkeite with trace of colorless fine fibrous trona present in vugs in lower 0.2 ft. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 105. 3 | 0. 4 | Burkeite and trona. Fractured core. Fragments of grayish-orange (10YR 6/6) dense hard massive burkeite with small vugs and pockets of white (N 9) to very pale orange (10YR 8/2) massive trona. Burkeite 98 percent, trona 2 percent. |
| 105. 6 | . 3 | No core. |
| 105. 7 | . 1 | Trona and halite. Well-consolidated aggregate of white (N 9) massive trona with 30 percent disseminated colorless halite cubes modified by octahedron and subhedra averaging, 2 mm in length; trace of disseminated trona blades averaging 5 mm in length at base. |
| 105. 9 | . 2 | Burkeite. Well-consolidated dense hard massive grayish-orange (10YR 7/4) to yellowish-gray (5GY 6/1) dense hard massive burkeite. |
| 106. 3 | . 4 | Halite, trona, and burkeite. Poorly consolidated core. Fragments of white (N 9) to light-gray (N 7) soft massive trona with 10 percent disseminated colorless halite subhedra averaging 2 mm in length; loose disseminated fragments of grayish-orange (10YR 7/4) hard dense massive burkeite in colorless halite sand. Probably cuttings, not core. Halite 60 percent, trona 35 percent, burkeite 5 percent. |
| 106. 6 | . 3 | Trona, burkeite, and halite. Well-consolidated white (N 9) to light-gray (N 7) massive trona with seam, 10 mm wide, of fine trona blades averaging 3 mm in length at top; irregular streaks of colorless halite crystals, averaging 1 mm in length, intermixed with massive white (N 9) trona at 106.4 ft; irregular seam, up to 20 mm wide, of lenticular pockets of grayish-orange (10YR 7/4) dense hard massive burkeite at 106.4 to 106.5 ft. Trona 87 percent, burkeite 12 percent, halite 1 percent. |
| 106. 8 | . 2 | Burkeite and trona. Well-consolidated grayish-orange (10YR 7/4) dense hard massive burkeite with scattered lenticular vuggy pockets of very pale orange (10YR 8/2) massive trona containing traces of intermixed colorless fibrous trona. Burkeite 95 percent, trona 5 percent. |
| 106. 9 | . 1 | Trona and halite. Well-consolidated white (N 9) to medium-gray (N 5) massive trona with 30 percent disseminated colorless halite crystals in lower 10 mm. |
| 107. 2 | . 3 | Borax and trona. Well-consolidated aggregate of colorless to smoky borax crystals up to 20 mm in length, averaging 10 mm; 15 percent interstitial white (N 9) sugary-textured massive trona intermixed with minor colorless to grayish-yellow (5Y 8/4) fibrous and bladed trona, blades averaging 5 mm in length. Borax 80 percent, trona 20 percent. |
| 107. 3 | . 1 | No core. |
| 108. 4 | 1. 1 | Halite and trona. Friable aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length, with 10 percent interstitial white (N 9) to moderate yellowish-brown (10YR 5/4) to medium-gray (N 5) massive trona; trace of grayish-black (N 2) to dusky-brown (5YR 2/2) clay in lower 0.1 ft. |
| 109. 2 | . 8 | Burkeite, trona, and halite. Well-consolidated grayish-orange (10YR 7/4) dense hard vuggy massive burkeite with seams |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| | | and pockets of intermixed white (<i>N</i> 9) dense massive trona; vugs lined with grayish-orange (10YR 7/4) superficially stained colorless fibrous trona; colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length, intermixed with trona at 108.9 to 109.1 ft. Burkeite 80 percent, trona 15 percent, halite 5 percent. |
| 109.5 | 0.3 | Clay, trona, and borax. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to dark-gray (<i>N</i> 3) to very light gray (<i>N</i> 8) faintly finely laminated clay with distinct moderate reddish-orange (10R 6/6) algae(?) discolorations in upper 15 mm; seam, 10 mm wide, of 80 percent disseminated euhedral prismatic borax crystals averaging 5 mm in length, at 109.3 ft; seam, 15 mm wide, of white (<i>N</i> 9) very fine fibrous trona locally discolored moderate reddish-brown (10R 4/6) by algae(?) at base. Clay 74 percent, trona 17 percent, borax 9 percent. |
| 111.3 | 1.8 | No core. |
| 111.5 | .2 | Burkeite. Fractured core. Fragments of grayish-orange (10YR 7/4) dense hard massive burkeite. |
| 111.8 | .3 | Burkeite. Well-consolidated grayish-orange (10YR 7/4) moderately vuggy dense hard massive burkeite; trace of grayish-black (<i>N</i> 2) clay locally in a few vugs. |
| 112.0 | .2 | Burkeite. Fractured core. Fragments of yellowish-gray (5Y 7/2) to grayish-yellow (5Y 8/4) dense hard massive burkeite. |
| 112.1 | .1 | Clay and borax. Well-consolidated grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) clay with 75 percent disseminated euhedral borax crystals, averaging 15 mm in length, in lower 15 mm; trace of light-brown (5YR 6/4) trona discolored by algae(?) in upper 15 mm. Clay 63 percent, borax 37 percent. |
| 112.2 | .1 | Clay and northupite. Greenish-black (5GY 2/1) to grayish-black (<i>N</i> 2) to dusky yellow-green (5GY 5/2) to very light gray (<i>N</i> 8) faintly finely laminated clay with disseminated round to oval nodules from 0.05 to 1 mm in length, averaging 0.25 mm, of white (<i>N</i> 9) to grayish-yellow (5Y 8/4) massive northupite arranged in layers. Clay 95 percent, northupite 5 percent. |
| 112.4 | .2 | Trona and halite. Poorly consolidated dusky yellow-green (5GY 5/2) to dark greenish-gray (5GY 4/1) soft massive trona with intermixed colorless halite sand; a few disseminated colorless trona blades averaging 5 mm in length. May be cuttings, not core. Trona 80 percent, halite 20 percent. |
| 112.8 | .4 | Clay, gaylussite, and northupite. Greenish-black (5GY 2/1) to grayish-black (<i>N</i> 2) to very light gray (<i>N</i> 8) finely laminated clay with disseminated oval nodules of white (<i>N</i> 9) to grayish-yellow (5Y 8/4) massive northupite, up to 3 mm in length, arranged in layers; a few seams, 1-2 mm wide, of euhedral gaylussite silt; ripple or eddy marks at base of clay at 112.5 ft. Clay 96 percent, gaylussite 3 percent, northupite 1 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 113.0 | 0.2 | Clay, gaylussite*, and borax. Greenish-black (5GY 2/1) to grayish-black (N 2) to dusky yellow-green (5GY 5/2) to grayish-yellow (5Y 8/4) to very light gray (N 8) finely laminated clay with numerous seams, 1 mm wide, and disseminated crystals of colorless gaylussite* silt; seam, 10 mm wide, of 80 percent disseminated subhedral borax crystals, up to 30 mm in length, at 112.9 ft; 40 percent disseminated euhedral gaylussite crystals, averaging 2 mm in length, in lower 15 mm; scattered disseminated nodules, averaging 2 mm in length, of white (N 9) massive northupite. Clay 72 percent, gaylussite 15 percent, borax 13 percent. |
| 113.8 | .8 | No core. |
| 114.1 | .3 | Clay, northupite, and gaylussite. Grayish-black (N 2) to greenish-black (5GY 2/1) to light gray (N 7) faintly finely laminated clay; scattered nodules, averaging 5 mm in length, of white (N 9) to grayish-yellow (5Y 8/4) massive northupite; a few seams of disseminated intermixed gaylussite silt; fine faint laminae of moderate reddish-brown (10R 4/6) algae(?) in lower 20 mm. Clay 98 percent, northupite 1 percent, gaylussite 1 percent. |
| 114.2 | .1 | Trona. Well-consolidated white (N 9) to dark-gray (N 3) dense massive trona; seam 10 mm wide, of trona blades, averaging 10 mm in length, at top. |
| 114.5 | .3 | Clay, trona, and northupite. Black (N 1) to grayish-black (N 2) clay with 20 percent disseminated colorless trona blades averaging 20 mm in length, chiefly confined to lower 0.2 ft; wavy seams, 1 mm wide, of white (N 9) and moderate orange-pink (5YR 8/4) massive northupite in upper 20 mm. Clay 77 percent, trona 20 percent, northupite 3 percent. |
| 114.8 | .3 | Trona. Well-consolidated dense aggregate of dark-gray (N 3) to colorless trona blades averaging 20 mm in length. |
| 114.9 | .1 | Trona. Well-consolidated aggregate of colorless to superficially stained grayish-yellow (5Y 8/4) trona blades averaging 5 mm in length. |
| 115.1 | .2 | Trona. Well-consolidated slightly vuggy very light gray (N 8) to medium-gray (N 5) massive trona with thin streaks of colorless trona blades, averaging 5 mm in length, in lower 0.1 ft; trace of greenish-black (5GY 2/1) clay in vugs. |
| 115.2 | .1 | Northupite*, clay, and trona. Irregular seam of yellowish-gray (5Y 7/2) to grayish-yellow (5Y 8/4) soft massive northupite* containing 5 percent disseminated colorless trona blades, averaging 5 mm in length, with irregular seams, 1-5 mm wide, of black (N 1) clay, locally discolored blackish-red (5R 2/2) by intermixed algae(?). Northupite 85 percent, clay 10 percent, trona 5 percent. |
| 115.3 | .1 | Clay and gaylussite. Grayish-black (N 2) to greenish-black (5GY 2/1) to dusky yellow-green (5GY 5/2) faintly finely laminated clay with 10 percent disseminated very fine gaylussite silt. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 115.5 | 0.2 | Clay and gaylussite. Grayish-black (N 2) to greenish-black (5GY 2/1) clay with 35 percent disseminated euhedral colorless fine to coarse gaylussite sand. |
| 115.8 | .3 | Clay. Grayish-black (N 2) to greenish-black (5GY 2/1) to light-gray (N 7) very finely laminated clay with a few pockets of very fine gaylussite silt. |
| 117.8 | 2.0 | No core. |
| 118.1 | .3 | Clay and trona. Black (N 1) to grayish-black (N 2) clay with irregular pockets and streaks of trona blades averaging 3 mm in length. Clay 90 percent, trona 10 percent. |
| 119.0 | .9 | Trona, burkeite, northupite, and clay. Well-consolidated aggregate of white (N 9) to medium dark-gray (N 4) massive trona with lenticular horizontal streaks of colorless to grayish-yellow (5Y 8/4) fibrous trona, locally containing 1 to 5 percent interstitial black (N 1) to greenish-black (5GY 2/1) clay; seams, 5 mm wide, of yellowish-gray (5Y 8/1) massive northupite containing 10 percent disseminated colorless trona needles, averaging 5 mm in length, at 118.6 and 118.8 ft; large lenticular pocket, 30 mm wide, of pale yellowish-brown (10YR 6/2) dense hard massive burkeite at base. Trona 90 percent, burkeite 5 percent, northupite 4 percent, clay 1 percent. |
| 119.3 | .3 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) to very light gray (N 8) finely laminated clay with 10 percent disseminated gaylussite silt; a few disseminated oval to round nodules, averaging 0.25 mm in length, of white (N 9) massive northupite in upper 10 mm; several contorted laminae at 119.1 ft. |
| 119.7 | .4 | Clay and gaylussite. Black (N 1) to grayish olive-green (5GY 3/2) to light olive-brown (5Y 5/6) to grayish-olive (10Y 4/2) clay with 35 percent disseminated euhedral to subhedral gaylussite crystals from 1 to 10 mm in length, averaging 5 mm. |
| 119.8 | .1 | No core. |
| 120.2 | .4 | Clay and gaylussite. Grayish-black (N 2) to greenish-black (5GY 2/1) to grayish olive-green (5GY 3/2) to very light gray (N 8) finely laminated clay with seams 5-10 mm wide, of 30 percent disseminated euhedral gaylussite sand in upper 0.2 ft. Clay 96 percent, gaylussite 4 percent. |
| 120.4 | .2 | Clay and gaylussite. Greenish-black (5GY 2/1) to grayish-black (N 2) to dusky-yellow (5Y 6/4) to dusky yellow-green (5GY 5/2) faintly finely laminated clay with 30 percent disseminated euhedral gaylussite silt. |
| 120.5 | .1 | Trona and clay. Well-consolidated grayish-black (N 2) dense aggregate of trona blades averaging 15 mm in length; 25 percent interstitial black (N 1) clay in upper 20 mm. |
| 121.0 | .5 | Trona and clay. Vuggy aggregate of colorless to superficially stained grayish-yellow (5Y 8/4) trona blades up to 35 mm in length, averaging 20 mm, with 1 percent interstitial greenish-black (5GY 2/1) clay; intermixed pockets of medium-gray (N 5) massive trona in lower 0.1 ft. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 121. 4 | 0. 4 | Trona. Well-consolidated white (N 9) to dark greenish-gray (5GY 4/1) to medium dark-gray (N 4) massive trona with pockets of colorless trona blades in upper 0.1 ft. |
| 123. 4 | 2. 0 | Trona. Well-consolidated vuggy aggregate of colorless to superficially stained grayish-yellow (5Y 8/4) to light olive-brown (5Y 5/6) trona blades averaging 10 mm in length; numerous large pockets and irregular seams of white (N 9) to medium-gray (N 5) massive trona in upper 1.0 ft, gradually changing to pockets of bladed trona in massive trona in lower 1.0 ft; trace of greenish-black (5GY 2/1) clay locally present in some vugs with trona blades. |
| 123. 8 | . 4 | Clay and gaylussite. Moderate olive-brown (5Y 4/4) to pale-olive (10Y 6/2) to grayish-black (N 2) clay with 40 percent disseminated euhedral gaylussite crystals up to 30 mm in length, averaging 10 mm. |
| 124. 8 | 1. 0 | No core. |
| 127. 1 | 2. 3 | Clay and gaylussite. Grayish-black (N 2) to grayish-green (10GY 5/2) to grayish-yellow (5Y 8/4) to dark yellowish-orange (10YR 6/6) to dusky yellowish-brown (10YR 2/2) clay, locally finely laminated, with 30 percent disseminated euhedral gaylussite crystals averaging 10 mm in length. |
| 127. 3 | . 2 | Clay. Olive-gray (5Y 3/2) to medium dark-gray (N 4) to grayish-yellow (5Y 8/4) to greenish-gray (5G 6/1) faintly finely laminated clay. |
| 127. 6 | . 3 | Trona*, nahcolite*, and clay. Well-consolidated light bluish-gray (5B 7/1) to bluish-white (5B 9/1) compact massive trona with intermixed nahcolite*, probably discolored by intermixed clay; 1 percent grayish olive-green (5GY 3/2) to light olive-brown (5Y 5/6) intermixed clay in thin streaks and irregular ½- to 1-in. pockets. |
| 127. 8 | . 2 | Thenardite. Vuggy aggregate of euhedral to subhedral colorless thenardite crystals up to 95 mm in length, averaging 25 mm. |
| 128. 0 | . 2 | Clay. Grayish-olive (10Y 4/2) to grayish olive-green (5GY 3/2) to dusky-yellow (5Y 6/4) to moderate olive-brown (5Y 4/4) faintly finely laminated clay. |
| 128. 2 | . 2 | Clay and gaylussite. Greenish-black (5GY 2/1) to moderate olive-brown (5Y 4/4) to grayish-green (10GY 5/2) to grayish-black (N 2) to olive-gray (5Y 3/2) clay with 40 percent disseminated euhedral gaylussite crystals from 2 to 10 mm in length, averaging 5 mm. |
| 128. 3 | . 1 | Gaylussite*, nahcolite*, trona, and clay. Friable aggregate of gaylussite* crystals with 20 percent intermixed dusky-yellow (5Y 6/4) nahcolite* crystals averaging 10 mm in length; 1 percent disseminated colorless trona blades averaging 5 mm in length and 1 percent interstitial dusky yellow-green (5GY 5/2) to grayish-yellow (5Y 8/4) clay. |
| 128. 9 | . 6 | Clay and gaylussite. Moderate olive-brown (5Y 4/4) to olive-gray (5Y 3/2) clay with 40 percent disseminated gaylussite crystals averaging 10 mm in length. |
| 130. 0 | 1. 1 | No core. |

Searles drill hole GS-21

LOCATION: Searles Lake, Calif., approx. $\frac{1}{4}$ mile west of $\frac{1}{4}$ sec., secs. 20 and 21, in sec. 20, T. 25 S., R. 43 E., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,618 ft.

ELEVATION AT BOTTOM OF HOLE: 1,538.5 ft.

TOTAL DEPTH: 79.5 ft.

DATES DRILLED: May 9-17, 1955.

CASING USED: 16.3 ft of 16-in. casing; 53.8 ft of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 0.7 | 0.7 | Trona, clay, sand, and silt. Well-consolidated vuggy white (N 9) massive trona discolored dusky-yellow (5Y 6/4) by 1 percent intermixed clay; 5 percent intermixed sand and silt. |
| 1.9 | 1.2 | Clay and thenardite*. Dark greenish-gray (5G 4/1) to light olive-gray (5Y 5/2) soft silty clay; a few disseminated colorless blades and cruciform twins of thenardite*. |
| 2.0 | .1 | No core. |
| 2.2 | .2 | Clay. Dusky yellow-green (5GY 5/2) to black (N 1) dense tenacious clay. |
| 2.6 | .4 | Clay and trona. Black (N 1) tenacious clay with 50 percent disseminated colorless trona blades averaging 15 mm in length. |
| 2.8 | .2 | Clay. Black (N 1) very tenacious gumbo clay. |
| 3.2 | .4 | Trona and clay. Well-consolidated vuggy aggregate of colorless trona blades averaging 5 mm in length, up to 20 mm, with 35 percent black (N 1) tenacious clay in interstices and pockets. |
| 3.5 | .3 | Clay. Black (N 1) tenacious gumbo clay. |
| 4.0 | .5 | No core. |
| 5.4 | 1.4 | Clay. Black (N 1) tenacious gumbo clay. |
| 5.7 | .3 | Trona, clay, and hanksite. Well-consolidated aggregate of colorless trona blades averaging 10 mm in length, with disseminated subhedral to anhedral yellowish hanksite crystals averaging 10 mm in length; 30 percent black (N 1) tenacious clay in interstices and pockets throughout. Trona 60 percent, clay 30 percent, hanksite 10 percent. |
| 6.1 | .4 | No core. |
| 6.3 | .2 | Clay, trona, and hanksite. Black (N 1) tenacious clay with well-consolidated pockets of densely packed trona blades averaging 15 mm in length, locally in radiating clusters, containing 5 percent interstitial black (N 1) clay and 10 percent disseminated anhedral to subhedral hanksite crystals averaging 5 mm in length. Clay 50 percent, trona 40 percent, hanksite 10 percent. |
| 8.3 | 2.0 | Trona and clay. Well-consolidated aggregate of colorless trona blades up to 15 mm in length, averaging 5 mm, with 5 percent black (N 1) clay in irregular streaks and pockets. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 10.1 | 1.8 | Hanksite, trona, borax, and clay. Moderately friable aggregate of subhedral to euhedral yellowish hanksite crystals up to 15 mm in length, averaging 30 mm, with disseminated interstitial anhedral colorless borax crystals up to 50 mm in length, averaging 15 mm; interstitial colorless trona blades up to 20 mm in length, averaging 5 mm; 5 percent black (N 1) clay in irregular streaks chiefly confined to lower 0.5 ft. Hanksite 65 percent, trona 20 percent, borax 10 percent, clay 5 percent. |
| 10.9 | .8 | No core. |
| 11.9 | 1.0 | Hanksite, borax, trona, and clay. Moderately friable aggregate of euhedral to subhedral hanksite crystals averaging 20 mm in length, with 10 percent interstitial colorless trona blades averaging 5 mm in length; 30 percent disseminated interstitial euhedral to anhedral borax crystals averaging 10 mm in length; 10 percent black (N 1) clay in irregular pockets and in interstices throughout. |
| 12.0 | .1 | Hanksite and clay. Friable aggregate of euhedral hanksite crystals averaging 40 mm in length, with 50 percent intermixed interstitial black (N 1) clay; a few hanksite crystals showing basal pinacoid. |
| 12.1 | .1 | Clay. Well-consolidated black (N 1) clay. |
| 12.4 | .3 | Trona and clay. Well-consolidated aggregate of colorless trona blades averaging 5 mm in length, with 50 percent black (N 1) clay in interstices and pockets. |
| 12.7 | .3 | Clay and pirssonite. Well-consolidated black (N 1) clay with 10 percent disseminated pirssonite sand. |
| 13.1 | .4 | Clay, pirssonite*, and hanksite. Well-consolidated black (N 1) clay with 30 percent disseminated subhedral pirssonite* crystals averaging 1 mm in length; pockets of euhedral to subhedral hanksite crystals averaging 20 mm in length. Clay 55 percent, pirssonite 30 percent, hanksite 15 percent. |
| 13.6 | .5 | Trona. Well-consolidated aggregate of colorless trona blades averaging 5 mm in length; trace of intermixed black (N 1) clay in scattered streaks and pockets. |
| 13.8 | .2 | Clay and hanksite. Poorly consolidated black (N 1) soft clay with 35 percent disseminated subhedral hanksite crystals averaging 30 mm in length. |
| 14.2 | .4 | Trona and clay. Well-consolidated aggregate of colorless trona blades averaging 5 mm in length, discolored by 1 percent interstitial black (N 1) clay; seam, 10 mm wide, of well-consolidated black (N 1) clay at top. Trona 91 percent, clay 9 percent. |
| 15.2 | 1.0 | No core. |
| 15.4 | .2 | Clay and pirssonite. Well-consolidated black (N 1) to grayish-black (N 2) with 30 percent disseminated medium to coarse subhedral pirssonite sand. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 16.2 | 0.8 | Hanksite, trona, and clay. Dense moderately vuggy granular massive aggregate of subhedral to anhedral hanksite crystals with pockets of subhedral hanksite crystals averaging 15 mm in length; numerous pockets of colorless fine trona blades averaging 5 mm in length; a few irregular streaks of interstitial black (N 1) clay. Hanksite 79 percent, trona 20 percent, clay 1 percent. |
| 16.4 | .2 | Trona. Well-consolidated slightly vuggy yellowish-gray (5Y 8/1) to medium-gray (N 5) massive trona with numerous 1-in. pockets of colorless fine trona blades averaging 3 mm in length; trace of intermixed black (N 1) clay. |
| 17.4 | 1.0 | Hanksite and trona. Well-consolidated vuggy aggregate of euhedral to subhedral hanksite crystals up to 20 mm in length, averaging 10 mm, with seams of 20 percent intermixed interstitial very pale orange (10YR 8/2) massive trona from 16.5 to 16.7 ft; scattered small pockets of interstitial very pale orange (10YR 8/2) massive trona throughout. Hanksite 97 percent, trona 3 percent. |
| 17.7 | .3 | Halite, trona, and hanksite. Well-consolidated moderately vuggy aggregate of halite cubes averaging 3 mm in length, with 30 percent interstitial white (N 9) soft massive trona; numerous lenticular horizontal vuggy seams containing halite cubes with a few euhedral to subhedral hanksite crystals from 3 to 30 mm in length. Halite 60 percent, trona 30 percent, hanksite 10 percent. |
| 20.4 | 2.7 | No core. |
| 20.7 | .3 | Halite. Friable aggregate of anhedral colorless halite crystals averaging 60 mm in length. |
| 21.4 | .7 | Trona, hanksite, and halite. Fractured core. Fragments of white (N 9) massive trona with 50 percent disseminated colorless halite cubes and subhedra, averaging 2 mm in length; fragments of anhedral to subhedral granular massive smoky hanksite with seams of white (N 9) massive trona; fragments consisting of aggregates of euhedral to subhedral hanksite crystals 20 mm in length. Trona 50 percent, hanksite 30 percent, halite 20 percent. |
| 22.3 | .9 | Hanksite. Well-consolidated granular aggregate of smoky hanksite with 1- to 2-in. pockets of euhedral hanksite crystals averaging 10 mm in length; core vuggy in lower 0.4 ft with euhedral hanksite crystals up to 40 mm in length; vugs locally lined with colorless fibrous trona. |
| 24.0 | 1.7 | No core. |
| 24.9 | .9 | Hanksite, trona, and clay. Well-consolidated dense slightly vuggy granular aggregate of anhedral to subhedral smoky hanksite crystals averaging 4 mm in length, with scattered ½- to 1-in. pockets of colorless fine fibrous trona, locally strained grayish-yellow (5Y 8/4), and ½-in. pockets of white (N 9) massive trona; 1 percent interstitial greenish-black (5GY 2/1) clay. Hanksite 97 percent, trona 2 percent, clay 1 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 27.0 | 2.1 | Trona and sulfahalite. Well-consolidated porous slightly vuggy aggregate of colorless fibrous trona, locally stained grayish-black (<i>N</i> 2) to dark greenish-gray (5GY 4/1) by trace of interstitial clay; wavy seams, averaging 5 mm in width, of grayish olive-green (5GY 3/2) to grayish-black (<i>N</i> 2) massive trona discolored by trace of intermixed clay from 26.1 to 26.3 ft; euhedral to subhedral yellowish sulfahalite octahedra, averaging 2 mm in length, commonly disseminated throughout; core fractured in lower 0.7 ft. |
| 28.1 | 1.1 | Trona. Well-consolidated slightly vuggy white (<i>N</i> 9) to greenish-gray (5GY 6/1) massive to very fine fibrous trona; horizontal lenticular vugs lined with colorless fibrous trona from 27.7 to 27.9 ft; seam, 2 mm wide, of olive-gray (5Y 3/2) clay at 27.5 ft; core fractured in lower 0.2 ft. |
| 32.0 | 3.9 | No core. |
| 35.5 | 3.5 | Trona. Well-consolidated white (<i>N</i> 9) massive trona with a few seams, from 2-to-10 mm wide, discolored light olive-gray (5Y 5/2) to olive-gray (5Y 3/2) by trace of intermixed clay; seam, 5 mm wide, of fine colorless fibrous trona, locally discolored grayish-yellow (5Y 8/4) at 33.9 ft; seams are wavy in lower 0.2 ft and contain traces of grayish-black (<i>N</i> 2) clay seams. |
| 35.9 | .4 | Clay and pirssonite. Well-consolidated grayish-black (<i>N</i> 2) to grayish-green (5G 5/2) to dusky-yellow (5Y 6/4) finely laminated clay with 10 percent disseminated subhedral to anhedral pirssonite crystals averaging 3 mm in length, in lower 0.2 ft. Clay 95 percent, pirssonite 5 percent. |
| 36.1 | .2 | Clay and pirssonite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with 40 percent disseminated anhedral pirssonite crystals. |
| 36.6 | .5 | Clay and pirssonite*. Black (<i>N</i> 1) clay with 40 percent disseminated subhedral to anhedral pirssonite* crystals averaging 3 mm in length. |
| 37.3 | .7 | Clay, pirssonite, and borax. Well-consolidated grayish-black (<i>N</i> 2) to grayish-green (10GY 5/2) to grayish-yellow (5Y 8/4) to dark-gray (<i>N</i> 3) finely laminated clay with 10 percent disseminated subhedral to anhedral pirssonite crystals averaging 5 mm in length; irregular seam, 5 mm wide, of anhedral borax at base. Clay 88 percent, pirssonite 10 percent, borax 2 percent. |
| 37.8 | .5 | Clay and pirssonite. Black (<i>N</i> 1) to olive-black (5Y 2/1) clay with 25 percent disseminated subhedral pirssonite crystals up to 35 mm in length, averaging 10 mm. |
| 38.5 | .7 | Clay. Well-consolidated black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) clay with fine widely spaced grayish yellow-green (5GY 7/2) to pale greenish-yellow (10Y 8/2) laminae. |
| 40.2 | 1.7 | Clay and gaylussite*. Well-consolidated grayish-black (<i>N</i> 2) to grayish-yellow (5Y 8/4) to dusky-yellow (5Y 6/4) to greenish-gray (5G 6/1) to very light gray (<i>N</i> 8) to white (<i>N</i> 9) finely laminated clay; a few 1-in. pockets of subhedral gaylussite* crystals averaging 10 mm in length; laminae slightly wavy in upper 0.1 ft. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 42.4 | 2.2 | No core. |
| 44.0 | 1.6 | Clay and gaylussite. Dark greenish-gray (5G 4/1) to greenish-gray (5GY 6/1) to grayish-black (N 2) to grayish-yellow (5Y 8/4) to dark yellowish-orange (10YR 6/6) to very light gray (N 8) finely laminated clay with 15 percent subhedral gaylussite crystals up to 20 mm in length, averaging 5 mm, in pockets and disseminated throughout. |
| 44.3 | .3 | Clay. Greenish-black (5GY 2/1) to grayish-black (N 2) to grayish-yellow (5Y 8/4) to dusky yellow-green (5GY 5/2) to olive-gray (5Y 3/2) to very light gray (N 8) finely laminated clay. |
| 46.4 | 2.1 | Clay and gaylussite. Grayish-black (N 2) to grayish olive-green (5GY 3/2) to light bluish-gray (5B 7/1) to medium bluish-gray (5B 5/1) to olive-gray (5Y 3/2) coarsely laminated clay revealed by color differences, with scattered irregular pockets of subhedral to anhedral gaylussite crystals averaging 5 mm in length; distinct laminae, 0.5 to 1 mm wide, of moderate reddish-brown (10R 4/6) algae(?) at 44.4, 44.5, 45.0, and 45.2 ft, with vague moderate reddish-brown (10R 4/6) discolorations from 45.2 ft to base. Clay 95 percent, gaylussite 5 percent. |
| 48.2 | 1.8 | No core. |
| 49.6 | 1.4 | Clay and gaylussite. Grayish-black (N 2) to dark greenish-gray (5G 6/1) to grayish blue-green (5BG 5/2) to dusky yellow-green (5GY 5/2) coarsely laminated clay revealed by color differences, with 15 percent disseminated subhedral to anhedral gaylussite crystals averaging 10 mm in length, locally in radiating clusters; vague local blackish-red (5R 2/2) algae(?) discolorations in clay. |
| 50.1 | .5 | Clay and gaylussite. Grayish-black (N 2) to dusky yellow-green (5GY 5/2) to grayish blue-green (5BG 5/2) coarsely laminated clay revealed by color differences, with 30 percent disseminated euhedral to subhedral gaylussite crystals averaging 2 mm in length. |
| 50.8 | .7 | Clay and gaylussite. Grayish-black (N 2) to blackish-red (5R 2/2) to dark greenish-gray (5G 4/1) coarsely laminated clay with seams of disseminated euhedral to subhedral gaylussite sand; vague moderate reddish-brown (10R 4/6) algae(?) laminae at 50.3 to 50.5 ft. Clay 95 percent, gaylussite 5 percent. |
| 51.2 | .4 | Clay, gaylussite*, and trona. Grayish-black (N 2) to greenish-gray (5G 6/1) clay with 40 percent disseminated euhedral gaylussite* crystals averaging 1 mm in length; 25 percent disseminated colorless to white (N 9) fine fibrous trona in pockets and streaks, averaging 5 mm in length, in lower 10 mm. |
| 52.0 | .8 | Clay and gaylussite. Grayish-black (N 2) to dusky yellow-green (5GY 5/2) to moderate olive-brown (5Y 4/4) coarsely laminated clay revealed by color differences, with 20 percent intermixed anhedral gaylussite. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 52.3 | 0.3 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to moderate olive-brown (<i>5Y</i> 4/4) clay with 40 percent disseminated anhedral gaylussite crystals averaging 5 mm in length, with a few intermixed euhedral gaylussite crystals, averaging 2 mm in length, in upper 0.1 ft. |
| 52.8 | .5 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to greenish-gray (<i>5G</i> 6/1) to moderate olive-brown (<i>5Y</i> 4/4) coarsely laminated clay revealed by color differences; 30 percent disseminated anhedral gaylussite in upper 0.4 ft, with disseminated euhedral gaylussite crystals, averaging 5 mm in length, in lower 0.1 ft. |
| 53.0 | .2 | Clay and gaylussite. Black (<i>N</i> 1) clay with 10 percent disseminated euhedral gaylussite crystals from sand size to 2 mm in length; disseminated pinpoint discolorations in clay of moderate reddish-brown (<i>10R</i> 4/6) algae(?). |
| 53.1 | .1 | Trona and clay. Well-consolidated dense aggregate of colorless trona blades averaging 10 mm in length, with 5 percent interstitial black (<i>N</i> 1) clay chiefly confined to upper 10 mm. |
| 53.4 | .3 | Trona. Well-consolidated dense white (<i>N</i> 9) massive trona with scattered vuggy ¼-in. pockets lined with colorless fibrous trona; local traces of interstitial black (<i>N</i> 1) clay. |
| 53.5 | .1 | Trona. Well-consolidated vuggy aggregate of colorless fine fibrous trona with intermixed pockets and streaks of medium-gray (<i>N</i> 5) massive trona. |
| 55.8 | 2.3 | Trona. Well-consolidated white (<i>N</i> 9) massive trona, locally discolored medium-gray (<i>N</i> 5) by trace of intermixed clay; scattered vugs, ¼- to 1-in. long, lined with colorless fine fibrous trona; distinct seams, 5 mm wide, discolored orange to dark yellowish-orange (<i>10YR</i> 6/6) by intermixed algae(?) at 54.7 and 55.4 ft. |
| 56.8 | 1.0 | No core. |
| 57.6 | .8 | Trona. Well-consolidated white (<i>N</i> 9) to grayish yellow-green (<i>5GY</i> 7/2) massive trona; locally discolored dark-gray (<i>N</i> 3) by intermixed clay; seam of colorless fine fibrous trona from 57.2 to 57.3 ft; a few ¼- to 1-in. vugs lined with colorless fine fibrous trona; irregularly discolored moderate reddish-orange (<i>10R</i> 6/6) seams in upper 0.3 ft due to intermixed algae(?). |
| 57.7 | .1 | Clay and gaylussite. Well-consolidated grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1) to grayish olive-green (<i>5GY</i> 3/2) faintly finely laminated clay with 5 percent disseminated fine gaylussite silt. |
| 58.9 | 1.2 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to olive-gray (<i>5Y</i> 3/2) clay with 35 percent disseminated anhedral to euhedral gaylussite crystals averaging 4 mm in length; seams, averaging 0.5 mm wide, of anhedral massive gaylussite from 57.8 to 57.9 ft and from 58.6 to 58.9 ft. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 59.4 | 0.5 | Clay, gaylussite* and northupite*. Black (N 1) to grayish-black (N 2) clay with 50 percent disseminated euhedral colorless gaylussite* crystals averaging 5 mm in length; scattered ½-in. pockets of disseminated yellowish northupite* octahedra averaging 1 mm in length. |
| 60.1 | .7 | Clay and pirssonite*. Black (N 1) to grayish-black (N 2) clay with 40 percent disseminated pirssonite* sand; irregular moderate reddish-brown (10R 4/6) algae(?) streaks at 59.6 to 59.7 ft. |
| 60.9 | .8 | Trona and clay. Well-consolidated white (N 9) massive to colorless fine fibrous trona, locally discolored grayish-black (N 2) by 2 percent intermixed clay. |
| 61.2 | .3 | No core. |
| 61.3 | .1 | Trona and clay. Well-consolidated colorless fibrous trona, locally stained yellowish-gray (5Y 8/1) to greenish-gray (5GY 6/1) to light-brown (5YR 6/4); irregular wavy seam, 3 mm wide, containing 10 percent interstitial black (N 1) clay at base. Trona 99 percent, clay 1 percent. |
| 61.6 | .3 | Trona. Well-consolidated white (N 9) to greenish-gray (5GY 6/1) to light olive-gray (5Y 6/1) massive trona with trace of black (N 1) clay in local irregular pockets and streaks; vuggy seam, 5 mm wide, lined with colorless fibrous trona at 61.4 ft. |
| 61.7 | .1 | Trona. Well-consolidated vuggy aggregate of colorless fine fibrous trona, locally superficially stained grayish-yellow (5Y 8/4) to dark-gray (N 3) with disseminated small pockets and irregular streaks of medium-gray (N 5) massive trona; disseminated irregular nodules, averaging 1 mm in length, of moderate reddish-brown (10R 4/6) algae(?). |
| 62.1 | .4 | Trona. Well-consolidated slightly vuggy yellowish-gray (5Y 8/1) massive trona with irregular wavy anastomosing seams discolored dark-gray (N 3) to greenish-gray (5GY 6/1) by trace of intermixed clay; vugs, ¼ to 1 in. long, lined with colorless fine fibrous trona. |
| 62.5 | .4 | Trona. Pulverulent vuggy porous aggregate of colorless fibrous trona, locally stained grayish-yellow (5Y 8/4); common disseminated nodules, up to 3 mm in length, averaging 1 mm, of moderate reddish-brown (10R 4/6) algae(?). |
| 62.6 | .1 | Clay. Core fractured. Black (N 1) to grayish-black (N 2) clay, locally discolored vague blackish-red (5R 2/2) by algae(?). |
| 63.2 | .6 | Trona. Well-consolidated white (N 9) to yellowish-gray (5Y 8/1) massive trona, locally discolored greenish-gray (5G 6/1) to dark greenish-gray (5G 4/1) by trace of intermixed clay. |
| 63.9 | .7 | Trona and clay. Fractured core. Well-consolidated fragments of white (N 9) to yellowish-gray (5Y 8/1) massive trona with irregular pockets of colorless fine fibrous trona, locally stained grayish-yellow (5Y 8/4); 15 percent interstitial black (N 1) clay between fragments possibly representing clay seams or pockets. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 64. 2 | 0. 3 | Trona. Well-consolidated colorless to yellowish-gray (5Y 8/1) compact fibrous trona. |
| 65. 3 | 1. 1 | Trona. Well-consolidated grayish-orange (10YR 7/4) to very pale orange (10YR 8/2) massive trona; a few pockets and streaks of colorless to very pale orange (10YR 8/2) fine fibrous trona from 64.6 ft to base; thin streaks and spots of moderate reddish-orange (10R 6/6) algae(?) in lower 0.4 ft. |
| 65. 9 | . 6 | No core. |
| 66. 1 | . 2 | Trona. Fractured core. Fragments of white (N 9) soft massive trona with fragments of well-consolidated white (N 9) hard massive trona containing vuggy pockets of colorless fine fibrous trona; moderate reddish-orange (10R 6/6) algae(?) stains locally present. |
| 67. 5 | 1. 4 | Trona. Well-consolidated slightly vuggy white (N 9) to yellowish-gray (5Y 8/1) to greenish-gray (5GY 6/1) massive trona with common irregular pockets and streaks of colorless fibrous trona, locally stained grayish-yellow (5Y 8/4) to greenish-black (5GY 2/1) by trace of intermixed clay; discolored seams, streaks, and spots of intermixed orange to moderate reddish-orange (10R 6/6) algae(?) throughout; wavy seams of trona, averaging 5 mm in width, revealed by color differences, and thin seams of intermixed clay, averaging 2 mm in width, between 67.2 and 67.4 ft. |
| 67. 6 | . 1 | Northupite and clay. Well-consolidated grayish-orange (10YR 7/4) to dark greenish-gray (5GY 4/1) soft massive northupite with thin streaks of intermixed dark-gray (N 3) to grayish-black (N 2) clay throughout. Northupite 95 percent, clay 5 percent. |
| 67. 7 | . 1 | Clay and trona. Grayish-black (N 2) clay with seams and streaks, averaging 2 mm in width, of white (N 9) soft massive trona. Clay 70 percent, trona 30 percent. |
| 68. 3 | . 6 | Clay and northupite. Well-consolidated black (N 1) to grayish-black (N 2) clay with a few seams, 2-3 mm wide, of disseminated round to oval white (N 9) to light-gray (N 7) nodules, averaging 1 mm in diameter, of massive northupite; very faint fine closely spaced very light gray (N 8) to light greenish-gray (5GY 8/1) laminae in lower 0.3 ft. Northupite less than 1 percent. |
| 68. 5 | . 2 | Clay and gaylussite. Well-consolidated black (N 1) to grayish-black (N 2) to olive-gray (5Y 3/2) to moderate olive-brown (5Y 4/4) clay with 60 percent disseminated subhedral gaylussite crystals averaging 5 mm in length. |
| 68. 9 | . 4 | Clay. Well-consolidated grayish-black (N 2) to greenish-black (5GY 2/1) clay with faint fine closely spaced very light gray (N 8) laminae; a few seams of disseminated gaylussite silt. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 69.5 | 0.6 | Clay and northupite*. Well-consolidated grayish-black (<i>N</i> 2) clay with seam, 5 mm wide, containing fine streaks of pale yellowish-brown (10YR 6/2) massive northupite* in clay at 69.0 ft. Clay 99 percent, northupite 1 percent. |
| 74.4 | .2 | Clay. Well-consolidated grayish-black (<i>N</i> 2) to very light gray (<i>N</i> 8) faintly finely laminated clay; a few scarce nodules, averaging 1 mm in length, of massive northupite. |
| 74.7 | .3 | Clay and gaylussite. Friable black (<i>N</i> 1) to greenish-black (5GY 2/1) to dusky-yellow (5GY 6/4) clay with 50 percent disseminated euhedral colorless gaylussite crystals 0.5 to 1 mm in length. |
| 74.9 | .2 | Clay. Well-consolidated grayish-black (<i>N</i> 2) to dusky yellow-green (5GY 5/2) to very light gray (<i>N</i> 8) faintly finely laminated clay. |
| 75.0 | .1 | Clay. Well-consolidated grayish-black (<i>N</i> 2) clay. |
| 75.5 | .5 | Trona and northupite. Well-consolidated slight vuggy aggregate of colorless trona blades averaging 5 mm in length, with pockets and streaks of interstitial yellowish-gray (5Y 8/1) soft massive northupite. Trona 95 percent, northupite 5 percent. |
| 75.7 | .2 | Clay, trona, and borax. Black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with 15 percent disseminated colorless trona blades 5-25 mm in length, averaging 10 mm; 5 percent disseminated subhedral borax crystals averaging 25 mm in length. |
| 76.2 | .5 | Clay. Well-consolidated grayish-black (<i>N</i> 2) to grayish olive-green (5GY 3/2) to greenish-gray (5GY 6/1) to grayish-yellow (5Y 8/4) finely laminated clay; trace of disseminated gaylussite silt. |
| 76.6 | .4 | Clay and gaylussite. Friable grayish-black (<i>N</i> 2) to olive-gray (5Y 3/2) clay with 50 percent disseminated euhedral gaylussite crystals up to 25 mm in length, averaging 10 mm. |
| 76.9 | .3 | Clay and gaylussite. Well-consolidated grayish-black (<i>N</i> 2) clay with 50 percent disseminated colorless euhedral gaylussite sand. |
| 77.3 | .4 | Clay. Well-consolidated grayish-black (<i>N</i> 2) to dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) to very light gray (<i>N</i> 8) finely laminated clay. |
| 77.4 | .1 | Clay and gaylussite. Well-consolidated grayish-black (<i>N</i> 2) to olive-gray (5Y 3/2) clay with 30 percent disseminated gaylussite silt. |
| 77.7 | .3 | Trona, borax, and clay. Fractured core. Fragments of well-consolidated slightly vuggy white (<i>N</i> 9) to medium-gray (<i>N</i> 5) massive trona with vuggy pockets of colorless fine fibrous trona; 5 percent disseminated anhedral borax crystals, averaging 15 mm in length; 5 percent intermixed black (<i>N</i> 1) clay in seams and pockets; scattered moderate reddish-brown (10R 4/6) algae(?) discolorations. |
| 77.8 | .1 | No core. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 79.5 | 1.7 | Clay and gaylussite. Friable olive-black (5Y 2/1) to grayish-black (N 2) to dusky yellowish-brown (10YR 2/2) clay with 20 percent disseminated euhedral to subhedral gaylussite crystals up to 40 mm in length, averaging 15 mm; locally finely laminated greenish-gray (5GY 6/1) to medium bluish-gray (5G 5/1) to dark-gray (N 3) to dark yellowish-orange (10YR 6/6) to dusky-yellow (5Y 6/4) to moderate olive-brown (5Y 4/4) clay. |

Searles drill hole GS-22

LOCATION: Searles Lake, Calif., about 50 ft southwest of center sec. 31, T. 25 S., R. 44 E., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,617 ft.

ELEVATION AT BOTTOM OF HOLE: 1,511.6 ft.

TOTAL DEPTH: 105.4 ft.

DATES DRILLED: June 1-17, 1955.

CASING USED: 19.5 ft of 16-in. casing; 77.7 ft of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 0.3 | 0.3 | Halite and clay. Friable vuggy aggregate of colorless halite cubes and cubes modified by octahedron, averaging 5 mm in length, with 5 percent interstitial dusky yellow-green (5GY 5/2) soft*moist clay; upper 10 mm stained pale-red (10R 6/2) by algae(?). |
| 2.1 | 1.8 | Halite and clay. Unconsolidated aggregate of colorless halite cubes modified by octahedron and subhedra, up to 35 mm in length, averaging 10 mm, with 5 percent interstitial dusky yellow-green (5GY 5/2) soft moist clay grading to grayish olive-green (5GY 3/2) clay in lower 0.6 ft. |
| 2.3 | .2 | No core. |
| 2.8 | .5 | Halite and clay. Unconsolidated aggregate of colorless halite cubes modified by octahedron and subhedra, up to 35 mm in length, averaging 10 mm, with 2 percent interstitial greenish-black (5GY 2/1) soft moist clay. |
| 3.1 | .3 | Thenardite*, clay, and halite. Well-consolidated slightly vuggy aggregate of colorless tabular thenardite* crystals averaging 20 mm in length; 5 percent interstitial greenish-black (5GY 2/1) clay with 2 percent disseminated colorless halite cubes modified by octahedron, averaging 2 mm in length, in lower 20 mm. |
| 3.6 | .5 | Hanksite, halite, and clay. Unconsolidated aggregate of euhedral to subhedral pale yellowish hanksite crystals up to 10 mm in length, averaging 2 mm, with 5 percent interstitial greenish-black (5GY 2/1) soft moist clay; 10 percent intermixed disseminated colorless halite cubes modified by octahedron and subhedra, up to 10 mm in length, averaging 2 mm. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 4.0 | 0.4 | Hanksite and trona. Well-consolidated slightly vuggy granular aggregate of yellowish euhedral hanksite crystals from 0.5 to 2 mm in length, with 25 percent interstitial white (N 9) massive to colorless fine fibrous trona. |
| 4.2 | .2 | Trona, hanksite, and clay. Vuggy aggregate of colorless fine fibrous trona with ¼-in. pockets and streaks of white (N 9) massive trona; 20 percent disseminated yellowish euhedral hanksite crystals 3–10 mm in length; interstitial greenish-black (5G 2/1) clay in lower 0.2 ft with irregular seam, 10–30 mm wide, of 75 percent greenish-black (5GY 2/1) clay at base. Trona 47 percent, clay 33 percent, hanksite 20 percent. |
| 4.4 | .2 | No core. |
| 4.9 | .5 | Clay and halite. Grayish-black (N 2) to greenish-black (5G 2/1) soft moist clay with 50 percent disseminated colorless halite cubes modified by octahedron and subhedra, up to 15 mm in length, averaging 5 mm. |
| 5.7 | .8 | Clay. Well-consolidated dusky yellow-green (5GY 5/2) clay with numerous irregular thin stringers of grayish-black (N 2) clay. |
| 6.3 | .6 | No core. |
| 6.6 | .3 | Clay and halite. Grayish-black (N 2) to greenish-black (5G 2/1) soft moist clay with 25 percent disseminated colorless halite cubes modified by octahedron, averaging 5 mm in length. |
| 7.2 | .6 | Clay. Well-consolidated dusky yellow-green (5GY 5/2) clay with scattered ¼-in. pockets and thin irregular stringers of grayish-black (N 2) clay. |
| 7.4 | .2 | No core. |
| 7.6 | .2 | Clay and halite. Well-consolidated dusky yellow-green (5GY 5/2) clay, locally grayish-black (N 2) clay; with 25 percent disseminated colorless halite cubes modified by octahedron and subhedra, averaging 5 mm in length. |
| 9.1 | 1.5 | Clay. Well-consolidated dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) clay with irregular wavy streaks of grayish-black (N 2) clay. |
| 9.3 | .2 | No core. |
| 10.8 | 1.5 | Clay. Well-consolidated dusky yellow-green (5GY 5/2) to grayish-green (10GY 5/2) clay with numerous irregular wavy stringers and pockets of grayish-black (N 2) clay. |
| 14.7 | 3.9 | No core. |
| 15.8 | 1.1 | Clay. Fractured core. Fragments of black (N 1) to greenish-black (5GY 2/1) silty clay. |
| 16.1 | .3 | Clay. Black (N 1) silty clay. |
| 16.5 | .4 | Halite and clay. Well-consolidated aggregate of colorless halite cubes modified by octahedron and subhedra, up to 10 mm in length, averaging 3 mm, with 10 percent interstitial black (N 1) soft clay. |
| 16.7 | .2 | Clay and halite. Black (N 1) soft silty clay with 35 percent disseminated colorless halite cubes modified by octahedron and subhedra, averaging 5 mm in length. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|---|
| 17.8 | 1.1 | Halite and clay. Poorly consolidated aggregate of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 5 mm in length, with 10 percent interstitial black (N 1) soft clay. |
| 18.5 | .7 | No core. |
| 19.1 | .6 | Halite and clay. Friable aggregate of colorless halite cubes modified by octahedron and subhedra, up to 20 mm in length, averaging 4 mm, with 5 percent interstitial black (N 1) soft moist clay mainly confined to irregular interstitial streaks. |
| 19.9 | .8 | No core. |
| 20.3 | .4 | Halite and clay. Moderately friable aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 5 mm in length, with 1 percent interstitial dark greenish-gray (5G 4/1) clay. |
| 20.4 | .1 | Trona and clay. Fractured core. Fragments of white (N 9) to yellowish-gray (5Y 8/1) dense hard massive trona with 10 percent interstitial black (N 1) clay. |
| 21.4 | 1.0 | Halite, trona, and clay. Moderately friable vuggy aggregate of colorless halite cubes modified by octahedron and subhedra, up to 20 mm in length, averaging 5 mm, with 5 percent soft massive trona in irregular streaks discolored dark greenish-gray (5G 4/1) to grayish-black (N 2) by intermixed clay; seam, 10 mm wide, of black (N 1) clay at 21.1 ft. Halite 91 percent, trona 5 percent, clay 4 percent. |
| 22.4 | 1.0 | Halite and trona. Well-consolidated dense granular moderately vuggy aggregate of colorless halite crystals averaging 5 mm in length, with 2 percent interstitial white (N 9) massive trona; a few pockets and streaks of halite cubes and cubes modified by octahedron, up to 15 mm in length; trace of local interstitial greenish-black (5GY 2/1) clay. |
| 22.7 | .3 | Hanksite, halite, and clay. Unconsolidated mixture of yellowish euhedral to subhedral hanksite crystals from 5 to 40 mm in length, averaging 35 mm, with 10 percent interstitial colorless halite cubes modified by octahedron and subhedra, averaging 4 mm in length, discolored dark greenish-gray (5G 4/1) by 1 percent interstitial clay. |
| 23.4 | .7 | Halite, trona, and hanksite. Well-consolidated slightly vuggy aggregate of colorless halite crystals with 25 percent interstitial white (N 9) to yellowish-gray (5Y 8/1) massive trona; lenticular horizontal vugs in upper 0.2 ft lined with colorless fibrous trona; a few streaks, averaging 5 mm in width, of yellowish anhedral hanksite; trace of local grayish-black (N 2) interstitial clay. Halite 70 percent, trona 25 percent, hanksite 5 percent. |
| 25.0 | 1.6 | No core. |
| 25.1 | .1 | Clay and pirssonite. Well-consolidated black (N 1) to grayish-black (N 2) clay with streaks of moderate-brown (5YR 4/4) algae(?) discolored clay; 40 percent disseminated euhedral pirssonite crystals averaging 1 mm in length. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 25.3 | 0.2 | Hanksite and clay. Well-consolidated aggregate of euhedral yellowish hanksite crystals up to 70 mm in length, averaging 40 mm, with 20 percent interstitial black (N 1) clay. |
| 26.5 | 1.2 | Halite, trona, and clay. Well-consolidated dense granular slightly vuggy aggregate of colorless halite crystals with 5 percent interstitial white (N 9) massive trona; scattered vuggy pockets of colorless halite cubes modified by octahedron, averaging 2 mm in length; 0.1-ft seam containing 10 percent interstitial grayish-black (N 2) clay at 26.0 ft. |
| 26.8 | .3 | Trona and clay. Well-consolidated massive to fine fibrous trona discolored dark greenish-gray (5G 4/1) to grayish-black (N 2) by 5 percent intermixed clay. |
| 28.0 | 1.2 | Halite and trona. Well-consolidated moderately vuggy granular aggregate of colorless halite crystals with 2 percent interstitial white massive to fine fibrous trona; vuggy pockets of colorless halite cubes modified by octahedron, averaging 2 mm in length, with a few euhedral yellowish-gray (5Y 8/1) hanksite crystals; traces of grayish-black (N 2) clay locally present. |
| 28.3 | .3 | Trona and clay. Fractured core. Fragments of well-consolidated white (N 9) to yellowish-gray (5Y 8/1) massive trona; fragments of black (N 1) clay containing a few disseminated sulfohalite octahedra from 3 to 12 mm in length. Trona 80 percent, clay 20 percent. |
| 28.5 | .2 | Halite. Fractured core. Fragments of well-consolidated aggregates of halite subhedra averaging 5 mm in length. |
| 28.8 | .3 | Halite, hanksite, and clay. Well-consolidated slightly vuggy aggregate of colorless halite subhedra averaging 3 mm in length, with irregular horizontal streaks of yellowish anhedral hanksite and disseminated euhedral hanksite crystals up to 40 mm in length, in pockets in some places; 10 percent interstitial black (N 1) clay throughout; single sulfohalite octahedron. Halite 60 percent, hanksite 30 percent, clay 10 percent. |
| 29.0 | .2 | Hanksite, clay, trona, and sulfohalite. Fractured core. Fragments consisting of euhedral colorless hanksite crystals, averaging 15 mm in length, containing apparent inclusions of white (N 9) massive trona; 10 percent interstitial black (N 1) clay; a few sulfohalite octahedra averaging 4 mm in length. |
| 29.4 | .4 | No core. |
| 29.9 | .5 | Halite, trona, hanksite, and clay. Well-consolidated slightly vuggy aggregate of colorless halite crystals with 10 percent interstitial white (N 9) massive trona; euhedral hanksite crystals, up to 40 mm in length, disseminated in upper 0.1 ft and lower 0.1 ft; scattered streaks and pockets of interstitial black (N 1) clay. Halite 80 percent, trona 10 percent, hanksite 9 percent, clay 1 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 30.8 | 0.9 | Halite and trona. Well-consolidated slightly vuggy aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length, with 10 percent interstitial yellowish-gray (5Y 8/1) massive to colorless fine fibrous trona, locally discolored dark-gray (N 3) by trace of intermixed clay. |
| 31.1 | .3 | Trona and halite. Well-consolidated seams of white (N 9) to yellowish-gray (5Y 8/1) massive trona, locally discolored dark greenish-gray (5GY 4/1) by trace of intermixed clay; a few seams, averaging 5 mm in width, of disseminated colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length; faint moderate reddish-orange (10R 6/6) algae(?) stains in upper 2 mm. Trona 90 percent, halite 10 percent. |
| 31.5 | .4 | Halite and trona. Friable fragments consisting of aggregates of colorless halite cubes modified by octahedron and subhedra, averaging 3 mm in length, with 5 percent interstitial white (N 9) to greenish-gray (5GY 6/1) massive trona. |
| 31.9 | .4 | Halite and trona. Well-consolidated slightly vuggy granular aggregate of colorless halite crystals with 35 percent interstitial white (N 9) massive trona, locally discolored dark-gray (N 3) by intermixed clay; vugs in halite contain colorless halite cubes modified by octahedron, averaging 2 mm in length. |
| 32.6 | .7 | Halite and trona. Moderately friable aggregate of colorless halite cubes and subhedra, averaging 2 mm in length, with 2 percent interstitial greenish-gray (5GY 6/1) massive to colorless fine fibrous trona. |
| 33.5 | .9 | Hanksite, halite and trona. Well-consolidated moderately vuggy aggregate of colorless to pale-smoky euhedral to subhedral hanksite crystals averaging 10 mm in length, with interstitial pockets, 2-5 in. long, of colorless halite crystals, averaging 3 mm in length, containing 30 percent interstitial white (N 9) massive to fine fibrous trona; trace of intermixed black (N 1) clay in upper 0.3 ft. Hanksite 60 percent, halite 30 percent, trona 10 percent. |
| 34.4 | .9 | No core. |
| 34.7 | .3 | Hanksite. Well-consolidated colorless granular massive hanksite and densely packed subhedral hanksite crystal aggregates, crystals averaging 3 mm in length, discolored dark-gray (N 3) by trace of interstitial clay. |
| 35.4 | .7 | Halite and trona. Moderately friable vuggy aggregate of flat distorted colorless halite crystals resembling cubes modified by octahedron, up to 20 mm in length, averaging 5 mm, with apparent inclusions of white (N 9) massive trona; 10 percent interstitial white (N 9) to greenish-gray (5GY 6/1) massive to colorless fibrous trona; numerous lenticular horizontal vugs; core fractured in lower 0.4 ft. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 35.7 | 0.3 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length, with 10 percent interstitial white (N 9) to greenish-gray (5GY 6/1) massive trona, in some places in seams and streaks up to 10 mm wide. |
| 36.3 | .6 | Halite and trona. Moderately friable slightly vuggy aggregate of colorless halite cubes modified by octahedron, averaging 5 mm in length, with 1 percent interstitial white (N 9) to yellowish-gray (5Y 8/1) massive trona; trace of greenish-black (5GY 2/1) interstitial clay at 36.0 ft. |
| 36.5 | .2 | Hanksite and halite. Well-consolidated granular massive light-smoky hanksite with irregular seams, averaging 15 mm in width, of colorless halite cubes modified by octahedron, averaging 3 mm in length, at base and top. Hanksite 50 percent, halite 50 percent. |
| 37.0 | .5 | Trona and halite. White (N 9) to very pale orange (10YR 8/2) soft massive trona with 50 percent disseminated colorless halite cubes modified by octahedron and subhedra, averaging 3 mm in length. |
| 37.2 | .2 | Hanksite, halite, and trona. Well-consolidated granular massive light-smoky hanksite with streaks, 1-3 mm wide, of interstitial white (N 9) to very pale orange (10YR 8/2) soft massive trona; seam, averaging 15 mm in width, of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 2 mm in length, containing interstitial white (N 9) soft massive trona at base. Hanksite 75 percent, halite 15 percent, trona 10 percent. |
| 38.4 | 1.2 | No core. |
| 38.8 | .4 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron, from 2 to 10 mm in length, averaging 3 mm, with 10 percent interstitial white (N 9) to greenish-gray (5GY 6/1) massive trona. |
| 39.1 | .3 | Trona and halite. Well-consolidated greenish-gray (5GY 6/1) massive trona with streaks and pockets of colorless halite cubes modified by octahedron, averaging 3 mm in length. Trona 65 percent, halite 35 percent. |
| 39.8 | .7 | Halite and hanksite. Fractured core. Fragments of well-consolidated aggregates of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with a few fragments containing irregular lenticular pockets of yellowish-gray (5Y 7/2) hard massive hanksite. Halite 70 percent, hanksite 30 percent. |
| 40.4 | .6 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and subhedra, averaging 3 mm in length, with streaks and pockets of white (N 9) to greenish-gray (5GY 6/1) massive trona mainly confined to upper 0.3 ft. Halite 85 percent, trona 15 percent. |
| 40.5 | .1 | No core. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 41.0 | 0.5 | Trona, halite, and hanksite. Friable aggregate of white (N 9) to greenish-gray (5GY 6/1) massive trona with streaks, seams, and pockets of colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length; irregular lenticular seams, 0.1 ft wide, of smoky massive hanksite; locally subhedral hanksite crystals averaging 4 mm in length at 40.7 to 40.8 ft; scattered streaks and pockets of colorless fine fibrous trona, locally stained grayish-yellow (5Y 8/4). Trona 60 percent, halite 20 percent, hanksite 20 percent. |
| 41.3 | .3 | Hanksite, halite, and trona. Well-consolidated aggregate of colorless to light-smoky subhedral hanksite crystals up to 20 mm in length, averaging 10 mm, with interstitial colorless halite cubes modified by octahedron and subhedra, averaging 3 mm in length, containing intermixed white (N 9) to greenish-gray (5GY 5/1) massive trona. Hanksite 90 percent, halite 7 percent, trona 3 percent. |
| 41.4 | .1 | Halite and trona. Unconsolidated aggregate of colorless halite cubes and subhedra, averaging 3 mm in length, with 10 percent interstitial white (N 9) massive trona. |
| 41.5 | .1 | Hanksite, halite, and trona. Well-consolidated moderately vuggy pockets of anhedral to subhedral smoky hanksite crystals averaging 3 mm in length, with 25 percent intermixed colorless halite cubes, cubes modified by octahedron and subhedra, averaging 3 mm in length; 10 percent interstitial white (N 9) massive trona. |
| 41.8 | .3 | Halite. Well-consolidated dense granular aggregate of colorless halite crystals; trace of white (N 9) massive trona in a few pockets 1-2 mm long. |
| 42.0 | .2 | Halite and trona. Friable aggregate of colorless halite cubes and subhedra, averaging 3 mm in length, with 1 percent interstitial colorless fibrous trona. |
| 43.8 | 1.8 | No core. |
| 44.4 | .6 | Halite and trona. Moderately friable aggregate of colorless halite cubes and subhedra, averaging 3 mm in length, with 5 percent interstitial colorless fibrous trona. |
| 44.7 | .3 | Halite, trona, and hanksite. Core fractured. Moderately friable aggregate of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 3 mm in length, with 5 percent disseminated euhedral colorless to light smoky hanksite crystals averaging 5 mm in length; 10 percent interstitial white (N 9) massive trona. |
| 45.0 | .3 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and cubes modified by octahedron, averaging 2 mm in length, with 20 percent interstitial colorless fine fibrous trona. |
| 45.3 | .3 | Trona, hanksite, and clay. Well-consolidated white (N 9) to yellowish-gray (5Y 8/1) massive trona with a few streaks, 1-2 mm wide, of black (N 1) clay; vuggy seam, 15 mm wide, of smoky massive hanksite containing euhedral hanksite crystals in vugs in lower 0.1 ft. Trona 82 percent, hanksite 17 percent, clay 1 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 45.5 | 0.2 | Clay and pirssonite. Well-consolidated black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with 35 percent disseminated euhedral pirssonite crystals averaging 1 mm in length. |
| 45.7 | .2 | Hanksite and trona. Well-consolidated aggregate of euhedral to subhedral smoky hanksite crystals up to 30 mm in length, averaging 10 mm, with 10 percent interstitial white (<i>N</i> 9) to greenish-gray (5GY 6/1) massive trona. |
| 46.2 | .5 | Halite and trona. Fractured and poorly consolidated core. Fragments consisting of aggregates of friable colorless halite cubes, cubes modified by octahedron and subhedra, averaging 3 mm in length, with 5 percent interstitial white (<i>N</i> 9) massive trona. |
| 47.5 | 1.3 | No core. |
| 48.0 | .5 | Halite, trona, and sulfohalite. Friable aggregate of colorless halite cubes, averaging 3 mm in length, with 20 percent interstitial colorless fibrous trona; a few disseminated yellowish sulfohalite octahedra averaging 5 mm in length. |
| 48.5 | .5 | Halite and trona. Well-consolidated moderately vuggy aggregate of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length, with 40 percent interstitial white (<i>N</i> 9) to yellowish-gray (5Y 8/1) massive trona; irregular pockets and streaks of interstitial colorless fine fibrous trona throughout. |
| 48.9 | .4 | Trona and sulfohalite. Well-consolidated colorless to white (<i>N</i> 9) fine fibrous trona with a few disseminated sulfohalite octahedra averaging 3 mm in length. |
| 49.0 | .1 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and subhedra, averaging 3 mm in length, with 30 percent interstitial white (<i>N</i> 9) massive to colorless fibrous trona. |
| 49.3 | .3 | No core. |
| 49.8 | .5 | Trona. Well-consolidated colorless to white (<i>N</i> 9) porous fine fibrous trona. |
| 51.1 | 1.3 | Trona, hanksite, and sulfohalite. Well-consolidated moderately vuggy fine colorless to white (<i>N</i> 9) fibrous trona with numerous pockets of euhedral to anhedral smoky hanksite crystals averaging 10 mm in length; a few disseminated sulfohalite octahedra up to 10 mm in length, averaging 5 mm. Trona 60 percent, hanksite 40 percent. |
| 51.8 | .7 | Trona. Well-consolidated white (<i>N</i> 9) to light olive-gray (5Y 6/1) to medium-gray (<i>N</i> 5) seams of soft massive to fine fibrous trona. |
| 52.9 | 1.1 | No core. |
| 53.1 | .2 | Trona. Well-consolidated white (<i>N</i> 9) to colorless porous fine fibrous trona. |
| 53.4 | .3 | Trona and hanksite. Well-consolidated yellowish-gray (5Y 8/1) to light olive-gray (5Y 6/1) massive trona with streaks, averaging 3 mm in which, of anhedral to subhedral smoky hanksite. Trona 90 percent, hanksite 10 percent. |
| 54.6 | 1.2 | Trona. Well-consolidated white (<i>N</i> 9) to greenish-gray (5GY 6/1) soft massive trona with a few seams of light olive-gray (5Y 6/1) trona. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 54.8 | 0.2 | No core. |
| 55.4 | .6 | Trona. Well-consolidated white (<i>N</i> 9) to light greenish-gray (5GY 8/1) soft massive trona. |
| 57.3 | 1.9 | No core. |
| 57.6 | .3 | Trona, hanksite, borax, and clay. Well-consolidated moderately vuggy mixture of white (<i>N</i> 9) to dusky yellow-green (5GY 5/2) massive trona with disseminated colorless trona blades; euhedral smoky hanksite crystals, subhedral colorless borax crystals, averaging 10 mm in length, and local intermixed black (<i>N</i> 1) clay. Trona 60 percent, hanksite 30 percent, borax 9 percent, clay 1 percent. |
| 57.9 | .3 | Borax, clay, and trona. Moderately friable aggregate of colorless euhedral to subhedral borax crystals averaging 5 mm in length; scattered pockets of light olive-gray (5Y 6/1) massive trona; local interstitial black (<i>N</i> 1) clay in pockets and irregular streaks. Borax 90 percent, clay 8 percent, trona 2 percent. |
| 58.1 | .2 | Clay and pirssonite. Black (<i>N</i> 1) to dark greenish-gray (5G 4/1) to dusky-yellow (5Y 6/4) to olive-gray (5Y 3/2) finely laminated clay; seam, 10 mm wide, of black (<i>N</i> 1) clay with 30 percent disseminated euhedral pirssonite crystals, averaging 1 mm in length, at top. Clay 95 percent, pirssonite 5 percent. |
| 58.6 | .5 | Clay and pirssonite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to olive-gray (5Y 3/2) clay with 40 percent disseminated subhedral to anhedral pirssonite crystals averaging 4 mm in length. |
| 59.5 | .9 | Clay and gaylussite*. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) to olive-gray (5Y 3/2) to very light gray (<i>N</i> 8) finely laminated clay with scattered pockets of subhedral to anhedral gaylussite* crystals averaging 5 mm in length. Clay 85 percent, gaylussite 15 percent. |
| 60.9 | 1.4 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) clay with fine widely spaced light greenish-gray (GY 8/1) to very light gray (<i>N</i> 8) laminae. |
| 61.5 | .6 | Clay and aragonite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) to very light gray (<i>N</i> 8) to greenish-gray (5GY 6/1) coarsely laminated clay with laminae averaging 1 mm wide of white (<i>N</i> 9) soft massive finely crystalline aragonite. Clay 95 percent, aragonite 5 percent. |
| 61.6 | .1 | Clay and gaylussite. Black (<i>N</i> 1) clay with 40 percent disseminated subhedral gaylussite* crystals averaging 2 mm in length. |
| 61.9 | .3 | Clay. Black (<i>N</i> 1) to greenish-black (5GY 2/1) to olive-gray (5Y 3/2) to dark greenish-gray (5GY 4/1) to grayish-yellow (5Y 8/4) to dusky-yellow (5Y 6/4) finely laminated clay; laminae wavy and locally contorted. |
| 62.8 | .9 | Clay and gaylussite*. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-gray (5G 6/1) to olive-gray (5Y 3/2) to grayish-yellow (5Y 8/4) to grayish-orange (10YR 7/4) to very light |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| | | gray (N 8) finely laminated clay with scattered pockets of subhedral to anhedral gaylussite* crystals averaging 5 mm in length. Clay 85 percent, gaylussite 15 percent. |
| 62.9 | 0.1 | Clay and gaylussite. Grayish-black (N 2) clay with 25 percent disseminated anhedral gaylussite. |
| 64.0 | 1.1 | Clay and gaylussite*. Grayish-black (N 2) clay with scattered pockets of anhedral gaylussite*. Clay 95 percent, gaylussite 5 percent. |
| 64.2 | .2 | No core. |
| 64.6 | .4 | Clay and gaylussite. Grayish-black (N 2) to dark greenish-gray (5G 4/1) to greenish-gray (5G 6/1) to dusky-yellow (5Y 6/4) finely laminated clay with scattered pockets of subhedral gaylussite crystals averaging 5 mm in length. Clay 85 percent, gaylussite 15 percent. |
| 65.1 | .5 | Clay and gaylussite. Grayish-black (N 2) to grayish-yellow (5Y 8/4) to very light gray (N 9) moderately coarsely laminated clay grading to finely laminated clay in lower 0.1 ft; a few pockets of anhedral gaylussite. Clay 95 percent, gaylussite 5 percent. |
| 66.0 | .9 | Clay, gaylussite*, and borax. Black (N 1) to grayish-black (N 2) clay with 40 percent disseminated anhedral gaylussite* crystals; numerous laminae, averaging 0.3 mm wide, of white (N 9) to grayish-yellow (5Y 8/4) massive gaylussite; irregular streaks and seams, averaging 3 mm in width, of colorless massive borax at 65.2 to 65.3 ft. Clay 55 percent, gaylussite 40 percent, borax 5 percent. |
| 66.6 | .6 | Clay and gaylussite. Grayish-black (N 2) to greenish-black (5GY 2/1) to grayish olive-green (5GY 3/2) clay with 40 percent disseminated subhedral gaylussite crystals averaging 1 mm in length; distinct seams, 3 mm wide, of intermixed moderate reddish-brown (10R 4/6) algae(?) at 66.3 ft and at base. |
| 66.7 | .1 | Clay. Grayish-black (N 2) clay with scattered vague discoloration of moderate reddish-brown (10R 4/6) algae(?) |
| 67.6 | .9 | Clay and gaylussite. Grayish-black (N 2) to greenish-gray (5G 6/1) to olive-gray (5Y 3/2) to grayish-yellow (5Y 8/4) clay with 40 percent disseminated euohedral gaylussite crystals averaging 1 mm in length; a few vague streaks of moderate reddish-brown (10R 4/6) algae(?). |
| 68.3 | .7 | Clay and gaylussite. Grayish-black (N 2) to greenish-gray (5G 6/1) clay with 5 percent disseminated gaylussite silt; intermixed vague moderate reddish-brown (10R 4/6) algae(?) discolorations. |
| 68.6 | .3 | No core. |
| 68.9 | .3 | Clay and northupite*. Black (N 1) to grayish-black (N 2) clay with seams, averaging 2 mm in width, of 75 percent disseminated euohedral northupite octahedra, averaging 1 mm in length, in upper 0.1 ft. Clay 97 percent, northupite 3 percent. |

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| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 69.3 | 0.4 | Clay and pirssonite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (<i>5GY</i> 2/1) clay with 35 percent disseminated euhedral pirssonite crystals from sand size to 5 mm in length, averaging 2 mm; a few vague discolorations moderate reddish-brown (<i>10R</i> 4/6) algae(?). |
| 69.4 | .1 | Clay. Black (<i>N</i> 1) clay with faint streaks of intermixed moderate reddish-brown (<i>10R</i> 4/6) algae(?). |
| 70.1 | .7 | Clay and pirssonite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay, locally greenish-gray (<i>5G</i> 6/1) to dusky-yellow (<i>5Y</i> 6/4) in upper 0.1 ft, with 35 percent disseminated euhedral pirssonite crystals 1 mm in length. |
| 70.5 | .4 | Trona, clay, borax, and pirssonite. Fractured core. Fragments of well-consolidated moderately vuggy colorless fibrous trona, locally stained dusky yellow-green (<i>5GY</i> 5/2), with streaks and pockets of medium-gray (<i>N</i> 5) massive trona; single fragments containing subhedral borax crystals 20 mm in length; other fragments with seams of black (<i>N</i> 1) clay containing 30 percent disseminated euhedral pirssonite sand. Trona 95 percent, clay 3 percent, borax 1 percent, pirssonite 1 percent. |
| 71.1 | .6 | Clay and pirssonite. Greenish-black (<i>5GY</i> 2/1) clay with 40 percent disseminated euhedral pirssonite crystals averaging 5 mm in length. |
| 71.2 | .1 | Clay. Black (<i>N</i> 1) clay with very faint very light gray (<i>N</i> 8) to moderate greenish-yellow (<i>10Y</i> 7/4) laminae. |
| 72.5 | 1.3 | Clay, gaylussite*, and borax. Black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1) to olive-gray (<i>5Y</i> 3/2) clay with 30 percent disseminated euhedral to subhedral gaylussite* crystals from 1 to 10 mm in length, averaging 5 mm; a few disseminated anhedral borax crystals averaging 20 mm in length; seam, 15 mm wide, of euhedral gaylussite sand between 72.2 and 72.3 ft. Clay 69 percent, gaylussite 30 percent, borax 1 percent. |
| 72.7 | .2 | Clay and pirssonite*. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with 30 percent disseminated euhedral pirssonite* sand. |
| 73.0 | .3 | No core. |
| 73.3 | .3 | Trona, clay, and halite. Poorly consolidated colorless soft fine fibrous trona discolored dark greenish-gray (<i>5G</i> 4/1) by 3 percent intermixed clay; scattered clay fragments; 5 percent intermixed colorless halite sand. Probably cuttings, not core. |
| 73.8 | .5 | Trona and clay. Well-consolidated aggregate of colorless to grayish-yellow (<i>5Y</i> 8/4) fine fibrous trona with irregular pockets and streaks of intermixed dark greenish-gray (<i>5G</i> 4/1) clay. Trona 98 percent, clay 2 percent. |
| 74.1 | .3 | Trona and halite. Well-consolidated greenish-gray (<i>5GY</i> 6/1) to very pale orange (<i>10YR</i> 8/2) massive trona with seams of grayish-orange (<i>10YR</i> 7/4) massive trona; seam, 20 mm wide, of colorless halite cubes modified by octahedron, |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| | | averaging 3 mm in length, containing moderate reddish-brown (10R 4/6) algae(?) inclusions at 74.9 ft. Trona 78 percent, halite 22 percent. |
| 75.0 | 0.9 | Halite and trona. Moderately friable aggregate of colorless halite cubes modified by octahedron, averaging 2 mm in length, with irregular pockets, streaks, and interstitial massive to colorless fibrous trona, locally discolored dark-gray (N 3) by intermixed clay; seam, 3 mm wide, of intermixed moderate reddish-brown (10R 4/6) algae(?) at base. Halite 85 percent, trona 15 percent. |
| 75.2 | .2 | Trona. Core fractured. Fragments of well-consolidated white (N 9) to greenish-gray (5GY 6/1) massive trona, locally discolored moderate reddish-brown (10R 4/6) by intermixed algae(?). |
| 75.7 | .5 | Clay and gaylussite*. Black (N 1) to grayish-black (N 2) clay, locally moderate olive-brown (5Y 4/4), with 50 percent disseminated subhedral gaylussite* crystals averaging 3 mm in length. |
| 77.6 | 1.9 | No core. |
| 79.0 | 1.4 | Clay, pirssonite, and borax. Black (N 1) to greenish-black (5GY 2/1) clay with 35 percent disseminated euhedral to subhedral pirssonite crystals averaging 3 mm in length; a few disseminated anhedral borax crystals averaging 20 mm in length. |
| 79.2 | .2 | Trona, clay, and pirssonite. Fragments of fine fibrous trona with 50 percent interstitial black (N 1) clay containing disseminated euhedral pirssonite crystals averaging 1 mm in length. Trona 50 percent, clay 35 percent, pirssonite 15 percent. |
| 79.4 | .2 | Halite and trona. Well-consolidated white (N 9) massive trona with pockets of intermixed colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length, with interstitial fine fibrous trona. Trona 90 percent, halite 10 percent. |
| 79.9 | .5 | Halite. Friable aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length, with trace of interstitial colorless fibrous trona. |
| 80.4 | .5 | Halite and trona. Friable aggregate of colorless halite cubes modified by octahedron and subhedra averaging 2 mm in length, with 5 percent interstitial greenish-gray (5GY 6/1) massive to colorless fibrous trona. |
| 82.2 | 1.8 | No core. |
| 82.7 | .5 | Halite. Moderately friable aggregate of colorless halite cubes modified by octahedron and subhedra averaging 3 mm in length. |
| 83.5 | .8 | Trona and halite. Well-consolidated aggregate of yellowish-gray (5Y 8/1) to light olive-gray (5Y 6/1) massive to fine fibrous trona with irregular streaks, pockets, and disseminated crystals of colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length. Trona 65 percent, halite 35 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 83.6 | 0.1 | Trona. Well-consolidated white (N 9) massive trona. |
| 84.2 | .6 | Halite. Friable aggregate of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 3 mm in length, up to 10 mm; trace of interstitial yellowish-gray (5Y 8/1) massive trona in lower 0.1 ft. |
| 84.4 | .2 | Trona. Well-consolidated slightly vuggy white (N 9) to yellowish-gray (5Y 8/1) massive trona, with vugs lined with fine colorless fibrous trona. |
| 84.9 | .5 | Halite. Friable aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 3 mm in length, with trace of interstitial white (N 9) massive and colorless fibrous trona. |
| 85.4 | .5 | Halite and trona. Well-consolidated aggregate of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 3 mm in length, with 40 percent white (N 9) to dusky yellow-green (5GY 5/2) massive trona in wavy seams, streaks, and interstices of halite; seam, 2 mm wide, of interstitial black (N 1) clay at 85.3 ft. |
| 86.2 | .8 | Halite, burkeite, and trona. Well-consolidated slightly vuggy aggregate of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 2 mm in length, with 15 percent very pale orange (10YR 8/2) to light gray (N 7) massive to colorless fibrous trona in irregular pockets and streaks interstitial to halite; numerous irregular pockets, up to 2 inches wide by 6 inches long, of very pale orange (10YR 8/2) to grayish-orange (10YR 7/4) hard dense slightly vuggy massive burkeite. Halite 45 percent, burkeite 40 percent, trona 15 percent. |
| 86.3 | .1 | No core. |
| 86.7 | .4 | Halite. Friable aggregate of colorless halite cubes and subhedra, averaging 3 mm in length, with trace of interstitial colorless fibrous trona. |
| 87.1 | .4 | Halite and trona. Well-consolidated aggregate of colorless halite cubes and subhedra, averaging 3 mm in length, with 25 percent interstitial medium light-gray (N 6) massive trona; a few moderate reddish-brown (10R 4/6) algae(?) inclusions in halite crystals. |
| 88.7 | 1.6 | Halite, trona, and burkeite*. Friable aggregate of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 3 mm in length, with 10 percent greenish-gray (5GY 6/1) to white (N 9) massive trona in interstices and irregular streaks throughout; seam, 10 mm wide, of slightly vuggy pockets of dense hard grayish-yellow (10YR 7/4) massive burkeite* at 88.1 ft. Halite 88 percent, trona 10 percent, burkeite 2 percent. |
| 88.8 | .1 | Clay and pirssonite. Black (N 1) clay with 25 percent disseminated euhedral pirssonite crystals averaging 5 mm in length. |
| 89.0 | .2 | Trona and halite. White (N 9) to greenish-gray (5GY 6/1) soft massive trona, locally discolored dark-gray (N 3) by |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| | | trace of intermixed clay; 10 percent disseminated colorless halite cubes and subhedra, averaging 3 mm in length. |
| 89.1 | 0.1 | Halite and trona. Poorly consolidated aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length, with 5 percent interstitial greenish-gray (5GY 6/1) soft massive trona. |
| 89.4 | .3 | Halite and trona. Well-consolidated aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 2 mm in length, with 40 percent white (N 9) massive trona in seams and streaks throughout. |
| 89.7 | .3 | Clay, borax, and pirssonite. Well-consolidated grayish-black (N 2) to greenish-black (5GY 2/1) clay with very faint fine very light gray (N 8) laminae; seam, 10 mm wide, of 75 percent disseminated prismatic borax crystals, averaging 10 mm in length at 89.6 ft, with a few disseminated borax crystals to base; 30 percent disseminated euhedral pirssonite sand in lower 15 mm; irregular moderate reddish-brown (10R 4/6) algae(?) stains in upper and lower 10 mm. Clay 87 percent, borax 8 percent, pirssonite 3 percent. |
| 90.2 | .5 | Trona. Well-consolidated slightly vuggy white (N 9) massive trona with 0.1-ft seam of colorless fibrous trona 10 mm from top and scattered pockets of colorless fibrous trona throughout. |
| 90.4 | .2 | Burkeite. Well-consolidated vuggy seam of irregular width consisting of yellowish-gray (5Y 8/1) to grayish-orange (10YR 7/4) dense hard massive burkeite; a few moderate reddish-orange (10R 6/6) algae(?) stains. |
| 90.7 | .3 | Clay, borax, northupite, and gaylussite. Grayish-black (N 2) to greenish-black (5GY 2/1) clay with very faint fine dusky yellow-green (5GY 5/2) to very light gray (N 8) laminae; seam, 10 mm wide, of 25 percent disseminated round to oval nodules of white massive northupite 10 mm from top; single large subhedral borax crystal, 65 mm in length, embedded in clay; a few seams, 1 mm wide, of disseminated gaylussite sand and pliable thin clay seams in lower 0.1 ft. Clay 91 percent, borax 5 percent, northupite 3 percent, gaylussite 1 percent. |
| 90.9 | .2 | Clay and gaylussite*. Grayish-black (N 2) to greenish-black (5GY 2/1) clay with 50 percent disseminated subhedral gaylussite crystals averaging 5 mm in length. |
| 91.1 | .2 | Clay, gaylussite, borax, and burkeite*. Grayish-black (N 2) clay with 40 percent disseminated clear colorless euhedral gaylussite crystals averaging 5 mm in length and grading to sand size in lower 0.1 ft; single large subhedral crystal, 50 mm in length, embedded in clay with white (N 9) to very pale orange (10YR 8/2) massive burkeite* partially rimming borax crystal, rim up to 2 mm thick. |
| 91.5 | .4 | Clay. Grayish-black (N 2) clay with faint fine very light gray (N 8) laminae. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 92.2 | 0.7 | Trona, clay, borax, northupite. Well-consolidated densely packed aggregate of trona blades 20 to 60 mm in length, averaging 50 mm, locally radiating, with 5 percent interstitial grayish-black (<i>N</i> 2) clay; irregular contorted seam, averaging 2 mm in width, of moderate orange-pink (5YR 8/4) massive northupite at 91.8 ft with scattered pockets, averaging 1 in. in length, of very pale orange (5YR 8/4) dense hard massive northupite; a few disseminated anhedral to subhedral borax crystals averaging 20 mm in length. Trona 88 percent, clay 5 percent, borax 5 percent, northupite 2 percent. |
| 92.5 | .3 | Clay and trona. Fractured core. Fragments of black (<i>N</i> 1) to medium bluish-gray (5B 5/1) clay with 25 percent disseminated colorless trona blades averaging 10 mm in length; a few disseminated pinpoints of moderate reddish-brown (10R 4/6) algae(?). |
| 93.0 | .5 | Trona. Well-consolidated slightly vuggy aggregate of colorless fibrous trona with streaks and pockets of white (<i>N</i> 9) massive trona; trace of intermixed dark-gray (<i>N</i> 3) clay. |
| 95.1 | 2.1 | No core. |
| 95.3 | .2 | Clay, northupite, and trona. Black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with a few lenticular pockets of colorless trona blades averaging 5 mm in length; seam, 10 mm wide, of grayish-orange (10YR 7/4) soft massive northupite at top. Clay 73 percent, northupite 17 percent, trona 10 percent. |
| 95.5 | .2 | Clay and northupite. Black (<i>N</i> 1) clay with very faint fine very light gray (<i>N</i> 8) laminae; disseminated round to oval nodules, averaging 1 mm in length, of white (<i>N</i> 9) massive northupite in upper 10 mm. Clay 98 percent, northupite 2 percent. |
| 95.7 | .2 | Clay and gaylussite. Black (<i>N</i> 1) clay with 35 percent disseminated euhedral clear colorless gaylussite crystals averaging 1 mm in length at top and grading to fine sand size at base. |
| 96.0 | .3 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with very faint fine very light gray (<i>N</i> 8) laminae. |
| 98.0 | 2.0 | Trona, northupite, and clay. Well-consolidated porous aggregate of colorless trona blades, averaging 5 mm in length, with pockets and irregular streaks of white (<i>N</i> 9) to very light gray (<i>N</i> 8) massive trona; seams, 5 mm wide, of 50 percent interstitial yellowish-gray (5Y 8/1) to grayish-orange (10YR 7/4) soft massive northupite at 97.5 and 97.6 ft; 5 percent interstitial grayish-black (<i>N</i> 2) clay in lower 0.3 ft. Trona 99 percent, northupite 1 percent. |
| 98.9 | .9 | Clay, gaylussite*, northupite, and schairerite*. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with seams, 10 mm wide, of 25 percent disseminated round to oval nodules, averaging 0.3 mm in length, of white (<i>N</i> 9) massive northupite at 98.2 and 98.5 ft; faint fine very light gray (<i>N</i> 8) laminae in lower 0.4 ft with scattered nodules, averaging 5 mm in |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| | | length, of white (N 9) finely crystalline pulverulent schairerite*; 5 percent disseminated gaylussite* silt in lower 0.2 ft, with seam, 15 mm wide, of 60 percent disseminated subhedral gaylussite crystals averaging 2 mm in length at base. Clay 93 percent, northupite 2 percent, gaylussite 5 percent. |
| 99.0 | 0.1 | No core. |
| 99.5 | .5 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) to grayish-green (10GY 5/2) clay with 40 percent disseminated subhedral gaylussite crystals averaging 5 mm in length. |
| 99.7 | .2 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) clay with 40 percent disseminated euhedral gaylussite sand. |
| 100.3 | .6 | Clay. Black (N 1) to grayish-black (N 2) to very light gray (N 8) finely laminated clay; traces of disseminated gaylussite silt throughout. |
| 100.4 | .1 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) clay with 30 percent disseminated gaylussite sand. |
| 100.6 | .2 | Clay. Black (N 1) clay with scattered very faint blackish-red (5R 2/2) algae(?) discolorations. |
| 101.1 | .5 | Trona and clay. Well-consolidated densely packed aggregate of colorless trona blades, locally in radiating clusters averaging 25 mm in length, with horizontal lenticular pockets of greenish-gray (5GY 6/1) hard massive trona from 100.8 to 100.9 ft; 10 percent interstitial black (N 1) clay throughout. |
| 101.4 | .3 | No core. |
| 101.5 | .1 | Clay. Black (N 1) clay with a few disseminated trona blades averaging 5 mm in length. |
| 101.8 | .3 | Clay. Black (N 1) to grayish-black (N 2) to greenish-black (5GY 2/1) to very light gray (N 8) faintly finely laminated clay with traces of disseminated gaylussite silt. |
| 103.5 | 1.7 | Clay and gaylussite. Grayish-black (N 2) to dusky yellowish-brown (10YR 2/2) to moderate olive-brown (5Y 4/4) clay, locally finely laminated greenish-gray (5GY 6/1) to dusky-yellow (5Y 6/4) to dark-gray (N 3) clay, with 35 percent disseminated euhedral to subhedral gaylussite crystals from 5 to 20 mm in length, averaging 10 mm. |
| 104.3 | .8 | Clay and gaylussite. Olive-gray (5Y 3/2) to dark-gray (N 3) to greenish-gray (5GY 6/1) to dusky-yellow (5Y 6/4) to light bluish-gray (5B 7/1) finely laminated clay with scattered pockets and disseminated crystals of anhedral gaylussite. Clay 90 percent, gaylussite 10 percent. |
| 105.4 | 1.1 | Clay and gaylussite. Olive-black (5Y 2/1) to dusky yellowish-brown (10YR 2/2) to dark-gray (N 3) to greenish-gray (5G 6/1) to dark greenish-gray (5GY 4/1) to grayish-yellow (5Y 8/4) to dusky-yellow (5Y 6/4) finely laminated clay with 20 percent disseminated euhedral gaylussite crystals averaging 10 mm in length and a few pockets of anhedral gaylussite. |

Searles drill hole GS-23

LOCATION: Searles Lake, Calif., 20 ft northeast of common cor., secs. 10, 11, 14, and 15, in sec. 11, T. 26 S., R. 43 E., Mount Diablo base line and Meridian.

ELEVATION AT TOP OF HOLE: 1,624 ft.

ELEVATION AT BOTTOM OF HOLE: 1,541.9 ft.

TOTAL DEPTH: 82.1 ft.

DATES DRILLED: June 17-30, 1955.

CASING USED: 31.4 ft of 16-in. casing; 58.2 ft of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 12.0 | 12.0 | Overburden mud, not cored. Moderate yellowish-brown (10YR 5/4) tenacious slightly silty clay. |
| 14.6 | 2.6 | Overburden mud, not cored. Dusky yellow-green (5GY 5/2) clay. |
| 24.0 | 9.4 | Overburden mud, not cored. Black (N 1) to grayish-black (N 2) tenacious clay with irregular streaks of dusky yellow-green (5GY 5/2) to moderate yellowish-brown (10YR 5/4) clay. |
| 30.0 | 6.0 | Overburden mud, not cored. Black (N 1) clay. |
| 31.1 | 1.1 | Overburden mud, not cored. Black (N 1) clay with a few disseminated colorless halite subhedra averaging 2 mm in length. |
| 32.3 | 1.2 | Clay and gaylussite*. Black (N 1) clay with local irregular streaks of dusky yellow-green (5GY 5/2) clay; pockets of disseminated anhedral gaylussite* crystals averaging 1 mm in length. Clay 95 percent, gaylussite 5 percent. |
| 32.4 | .1 | Trona. Fractured core. Fragments of well-consolidated dark-gray (N 3) fine fibrous to massive trona discolored by trace of intermixed clay, with fragments consisting of vuggy aggregate of colorless trona blades averaging 5 mm in length. |
| 32.7 | .3 | Thenardite, trona, and clay. Fractured core. Well-consolidated vuggy aggregate of colorless transparent blades of thenardite averaging 15 mm in length, with streaks and pockets of yellowish-gray (5Y 8/2) dense massive trona; local interstitial black (N 1) clay. Thenardite 78 percent, trona 20 percent, clay 2 percent. |
| 33.0 | .3 | Thenardite and trona. Well-consolidated seams of densely packed colorless thenardite blades, averaging 15 mm in length, intimately associated with lenticular pockets of massive yellowish-gray (5Y 8/1) trona; single 2-in. pocket of white (N 9) massive trona and local interstitial light-gray (N 7) massive trona. Thenardite 80 percent, trona 20 percent |
| 33.8 | .8 | Trona. Well-consolidated white (N 9) to yellowish-gray (5Y 8/1) massive trona with irregular slightly vuggy seams and pockets of colorless trona blades averaging 5 mm in length, locally stained grayish-yellow (5Y 8/4). |
| 34.3 | .5 | Trona and clay. Well-consolidated slightly vuggy aggregate of white (N 9) massive trona, locally discolored dark-gray (N 3), in irregular streaks by intermixed clay; irregular |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| | | vuggy streaks and pockets of colorless fine fibrous to colorless bladed trona, locally stained grayish-yellow (5Y 8/4). Trona 99 percent, clay 1 percent. |
| 36.1 | 1.8 | Trona. Core fractured in upper 0.3 ft. Well-consolidated moderately vuggy aggregate of colorless fibrous trona, locally stained grayish-yellow (5Y 8/4); numerous streaks and pockets of medium light-gray (N 6) to dark-gray (N 3) massive trona, discolored by trace of intermixed clay. |
| 36.3 | .2 | Trona, hanksite, and clay. Well-consolidated medium-gray (N 5) to grayish-black (N 2) massive trona, discolored by 10 percent intermixed clay; irregular pockets and streaks of colorless fibrous to fine bladed trona, locally stained grayish-yellow (5Y 8/4); disseminated anhedral yellowish hanksite crystals averaging 25 mm in length; a few disseminated smoky anhedral sulfohalite* crystals. Trona 70 percent, hanksite 20 percent, clay 10 percent. |
| 36.5 | .2 | Trona. Fractured core. Fragments of colorless fibrous trona, superficially stained faint grayish-yellow (5Y 8/4). |
| 37.0 | .5 | No core. |
| 39.1 | 2.1 | Trona. Well-consolidated aggregate of colorless fibrous trona, locally discolored medium-gray (N 4) by trace of interstitial clay; irregular streaks and pockets of massive trona in lower 0.4 ft. |
| 40.8 | 1.7 | No core. |
| 42.9 | 2.1 | Trona. Well-consolidated white (N 9) to yellowish-gray (5Y 8/1) soft porous massive trona. |
| 44.2 | 1.3 | No core. |
| 44.3 | .1 | Borax and clay. Poorly consolidated friable aggregate of colorless subhedral borax crystals averaging 1 mm in length; lower 10 mm consists of colorless subhedral borax crystals averaging 10 mm in length, with 30 percent interstitial black (N 1) clay. Borax 90 percent, clay 10 percent. |
| 44.9 | .6 | Clay and gaylussite. Grayish-black (N 2) to dark greenish-gray (5G 4/1) to olive-gray (5Y 3/2) to dusky-yellow (5Y 6/4) finely laminated clay with 25 percent disseminated subhedral to anhedral gaylussite crystals, averaging 10 mm in length. |
| 45.1 | .2 | Clay and gaylussite*. Black (N 1) to olive-gray (5Y 3/2) clay with 50 percent disseminated subhedral gaylussite* crystals averaging 10 mm in length. |
| 45.8 | .7 | Clay and gaylussite. Grayish-black (N 2) to olive-black (5Y 3/2) to grayish-yellow (5Y 3/4) to very light gray (N 8), locally finely laminated clay, with 30 percent disseminated subhedral gaylussite crystals averaging 10 mm in length. |
| 46.8 | 1.0 | Clay and gaylussite*. Grayish-black (N 2) to olive-gray (5Y 3/2) to greenish-gray (5GY 6/1) to dark greenish-gray (5G 4/1) to yellowish-gray (5Y 8/1) finely laminated clay with a few 1- to 2-in. pockets and irregular streaks of subhedral gaylussite* crystals averaging 10 mm in length. Clay 99 percent, gaylussite, 1 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 48.0 | 1.2 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with fine widely spaced very light gray (<i>N</i> 8) to grayish-yellow (5Y 8/4) laminae. |
| 48.3 | .3 | Clay and aragonite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with laminae, averaging 1 mm wide, of very light gray (<i>N</i> 8) to light gray (<i>N</i> 7) soft massive finely crystalline aragonite. Clay 95 percent, aragonite 5 percent. |
| 50.4 | 2.1 | Clay and gaylussite*. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-gray (5G 6/1) to dark greenish-gray (5G 4/1) to dusky-yellow (5Y 6/4) to grayish-yellow (5Y 8/4) to very light gray (<i>N</i> 8) finely laminated clay with scattered pockets of disseminated subhedral gaylussite* crystals up to 20 mm in length, averaging 10 mm. Clay 99 percent, gaylussite 1 percent. |
| 51.0 | .6 | No core. |
| 52.6 | 1.6 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-gray (5G 6/1) to dark greenish-gray (5G 4/1) to dusky-yellow (5Y 6/4) to grayish-yellow (5Y 8/4) to very light gray (<i>N</i> 8) finely laminated clay with pockets of disseminated subhedral to anhedral gaylussite crystals averaging 10 mm in length. Clay 85 percent, gaylussite 15 percent. |
| 52.8 | .2 | Clay and aragonite. Grayish-black (<i>N</i> 2) clay with widely spaced laminae, averaging 1 mm in width, of yellowish-gray (5Y 8/1) to very light gray (<i>N</i> 8) to white (<i>N</i> 9) soft finely crystalline massive aragonite. Clay 95 percent, aragonite 5 percent. |
| 55.3 | 2.5 | Clay and gaylussite*. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-gray (5G 6/1) to dark greenish-gray (5G 4/1) to grayish olive-green (5GY 3/2) to dusky yellow-green (5GY 5/2) to dusky-yellow (5Y 6/4) to olive-gray (5Y 3/2) coarsely laminated clay revealed by color differences; seams and pockets of subhedral to anhedral gaylussite* crystals averaging 5 mm in length; a few faint moderate reddish-brown (10R 4/6) algae(?) discolorations in clay. Clay 90 percent, gaylussite 10 percent. |
| 55.6 | .3 | No core. |
| 56.3 | .7 | Clay and gaylussite. Greenish-gray (5G 6/1) to dark greenish-gray (5G 4/1) to grayish-black (<i>N</i> 2) coarsely laminated clay revealed by color differences, with seams of disseminated subhedral to anhedral gaylussite crystals, averaging 10 mm in length. Clay 90 percent, gaylussite 10 percent. |
| 56.8 | .5 | Clay and gaylussite*. Grayish-black (<i>N</i> 2) to dark greenish-gray (5G 4/1) to grayish olive-green (5GY 3/2) clay with 30 percent disseminated subhedral gaylussite* crystals averaging 1 mm in length; local moderate reddish-brown (10R 4/6) algae(?) inclusions in clay and gaylussite crystals. |
| 57.0 | .2 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with faint local moderate reddish-brown (10R 4/6) algae(?) inclusions. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 57.2 | 0.2 | Clay and gaylussite*. Dark greenish-gray (5G 4/1) to grayish olive-green (5GY 3/2) to grayish-black (N 2) faintly coarsely laminated clay revealed by color differences, with 20 percent disseminated euhedral to subhedral gaylussite* crystals averaging 1 mm in length. |
| 57.4 | .2 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) clay with scattered pockets and streaks of disseminated euhedral gaylussite sand; irregular moderate reddish-brown (10R 4/6) algae(?) streaks in lower 0.1 ft. Clay 98 percent, gaylussite 2 percent. |
| 57.8 | .4 | Trona and clay. Well-consolidated white (N 9) to light gray (N 7) soft massive trona, locally discolored dark-gray (N 3) in pockets and streaks by 1 percent intermixed clay. |
| 59.7 | 1.9 | Clay and gaylussite*. Black (N 1) to grayish-black (N 2) to moderate olive-brown (5Y 4/4) to greenish-gray (5GY 6/1) clay with 50 percent disseminated subhedral gaylussite* crystals averaging 5 mm in length and anhedral gaylussite. |
| 60.0 | .3 | No core. |
| 60.6 | .6 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) clay with 45 percent disseminated euhedral to anhedral gaylussite crystals averaging 3 mm in length. |
| 60.8 | .2 | Clay and gaylussite. Black (N 1) clay with 1 percent disseminated gaylussite silt; trace of intermixed moderate reddish-orange (10R 6/6) algae(?). |
| 63.2 | 2.4 | Trona and clay. Well-consolidated moderately vuggy yellowish-gray (5Y 8/1) massive trona, locally discolored dark-gray (N 3) by intermixed clay in streaks and pockets; colorless fibrous trona in small pockets, irregular seams, and lining vugs; distinct orange algae(?) discolorations in seams, 5 mm wide, at 61.9 and 62.4 ft. Trona 99 percent, clay 1 percent. |
| 63.3 | .1 | Clay. Black (N 1) clay with very faint fine dusky yellow-green (5GY 5/2) laminae. |
| 64.1 | .8 | Clay and gaylussite*. Black (N 1) to greenish-black (5GY 2/1) clay with 40 percent disseminated subhedral gaylussite* crystals averaging 2 mm in length. |
| 64.2 | .1 | No core. |
| 65.8 | 1.6 | Clay and gaylussite. Black (N 1) to greenish-black (5GY 2/1) clay with 40 percent disseminated subhedral to euhedral gaylussite crystals averaging 10 mm in length. |
| 66.0 | .2 | Clay. Dark greenish-gray (5G 4/1) to medium bluish-gray (5B 5/1) to dusky yellow-green (5GY 5/2) to grayish-yellow (5Y 8/4) to grayish-black (N 2) finely laminated clay. |
| 66.2 | .2 | Clay and gaylussite. Black (N 1) clay with irregular pockets and streaks of disseminated euhedral colorless gaylussite crystals averaging 1 mm in length; trace of moderate reddish-brown (10R 4/6) algae(?) discolorations. Clay 90 percent, gaylussite 10 percent. |

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| Depth ¹ (feet) | Unit thick- ness (feet) | Description |
|------------------------------|----------------------------|--|
| 67.9 | 1.7 | Trona, clay, and northupite*. Well-consolidated white (N 9) to grayish-yellow (5Y 8/4) massive trona with numerous pockets and streaks of colorless fine fibrous trona; local intermixed black (N 1) to grayish-black (N 2) clay with irregular seam of black (N 1) to grayish-black (N 2) clay at 66.4 to 66.5 ft, varying from 15 mm to 30 mm in width, and containing irregular streaks of moderate reddish-brown (10R 4/6) algae(?); seam, 10 mm wide, of yellowish-gray (5Y 8/1) to grayish-orange (10YR 7/4) soft massive northupite* at base, containing 10 percent intermixed fine fibrous trona and 5 percent black (N 1) clay. Trona 93 percent, clay 5 percent, northupite 2 percent. |
| 68.3 | .4 | Clay and trona. Black (N 1) to grayish-black (N 2) clay with irregular pockets of white (N 9) to colorless fine fibrous trona in lower 0.1 ft; distinct laminae, 0.3 mm wide, of moderate reddish-brown (10R 4/6) algae(?) at 68.0 and 68.1 ft. Clay 95 percent, trona 5 percent. |
| 69.1 | .8 | No core. |
| 69.7 | .6 | Clay, northupite, and trona. Black (N 1) to grayish-black (N 2) clay with very fine faint very light gray (N 8) laminae; disseminated round to oval nodules of massive white (N 9) to yellowish-gray (5Y 8/1) northupite up to 3 mm in length, averaging 1 mm, arranged in layers; seam, 5 mm wide, of 50 percent grayish-orange (10YR 7/4) soft massive northupite, 30 percent colorless fibrous trona, and 20 percent intermixed clay at top, with a few radiating clusters of colorless trona blades averaging 20 mm in length in upper 0.1 ft. Clay 94 percent, northupite 5 percent, trona 1 percent. |
| 69.9 | .2 | Clay. Black (N 1) to grayish-black (N 2) clay with fine very light gray (N 8) laminae; a few laminae, averaging 1 mm wide, of disseminated colorless gaylussite silt. |
| 70.0 | .1 | Clay and gaylussite. Greenish-black (5GY 2/1) clay with 50 percent disseminated euhedral to subhedral gaylussite crystals averaging 5 mm in length. |
| 70.9 | .9 | Clay, northupite, and gaylussite. Black (N 1) to grayish-black (N 2) clay with faint fine very light gray (N 8) laminae; irregular streaks and laminae of disseminated gaylussite silt in upper 0.4 ft; seam, 5 mm wide, of intermixed grayish-orange (10YR 7/4) massive northupite and black clay at 70.7 ft, with seam, 2 mm wide, of yellowish-gray (5Y 8/1) massive northupite at 70.8 ft. Clay 97 percent, northupite 2 percent, gaylussite 1 percent. |
| 71.3 | .4 | Trona and clay. Well consolidated slightly vuggy aggregate of colorless trona blades averaging 20 mm in length, with pockets of white (N 9) to yellowish-gray (5Y 8/1) massive trona; 10 percent interstitial black (N 1) to greenish-black (5GY 2/1) clay in upper 0.1 ft and locally present throughout. Trona 97 percent, clay 3 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 71. 6 | 0. 3 | Clay and northupite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with faint fine very light gray (<i>N</i> 8) laminae; disseminated massive northupite nodules, averaging 0.5 mm in length, chiefly confined to upper 0.1 ft. Clay 95 percent, northupite 5 percent. |
| 71. 9 | . 3 | Clay and gaylussite. Black (<i>N</i> 1) clay with 40 percent disseminated clear colorless euhedral gaylussite crystals averaging 1 mm in length. |
| 72. 2 | . 3 | Clay and trona. Grayish-black (<i>N</i> 2) clay with 50 percent disseminated colorless trona blades up to 30 mm in length, averaging 10 mm, in lower 0.1 ft. Clay 83 percent, trona 17 percent. |
| 73. 9 | 1. 7 | No core. |
| 74. 1 | . 2 | Trona. Well-consolidated porous aggregate of colorless trona blades averaging 5 mm in length; scattered irregular pockets and streaks of white (<i>N</i> 9) massive trona; trace of interstitial dark gray (<i>N</i> 3) clay. |
| 74. 8 | . 7 | No core. |
| 75. 3 | . 5 | Clay and northupite. Grayish-black (<i>N</i> 2) to olive-gray (5Y 3/2) clay with faint fine very light gray (<i>N</i> 8) laminae; disseminated nodules, averaging 0.3 mm in length, of white (<i>N</i> 9) massive northupite in upper 0.1 ft. Clay 99 percent, northupite 1 percent. |
| 75. 6 | . 3 | Gaylussite and clay. Friable aggregate of subhedral gaylussite crystals, averaging 15 mm in length, with 25 percent interstitial black (<i>N</i> 1) clay. |
| 76. 4 | . 8 | Clay and gaylussite. Black (<i>N</i> 1) to olive-gray (5Y 3/2) clay with 35 percent disseminated clear colorless euhedral gaylussite crystals averaging 1 mm in length. |
| 76. 6 | . 2 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to grayish-olive (10Y 4/2) to greenish-gray (5G 6/1) to dusky-yellow (5Y 6/4) poorly laminated clay with irregular streaks of gaylussite sand and silt. Clay 95 percent, gaylussite 5 percent. |
| 77. 0 | . 4 | Clay and trona. Grayish-black (<i>N</i> 2) clay with irregular pockets, streaks, and seams, averaging 3 mm in width, of white (<i>N</i> 9) to medium light gray (<i>N</i> 6) massive trona, locally intermixed with clay. Clay 60 percent, trona 40 percent. |
| 77. 3 | . 3 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) to dusky-yellow (5Y 6/4) faint finely laminated clay with seam, 5 mm wide, of 40 percent disseminated euhedral gaylussite crystals, averaging 1 mm in length, at base. Clay 98 percent, gaylussite 2 percent. |
| 77. 9 | . 6 | Clay and gaylussite. Olive-gray (5Y 3/2) to moderate olive-brown (5Y 4/4) clay, locally greenish-gray (5G 6/1) to dark greenish-gray (5G 4/1) to dusky-yellow (5Y 6/4) finely laminated clay, with 45 percent disseminated euhedral to subhedral gaylussite crystals up to 30 mm in length, averaging 15 mm. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 78.6 | 0.7 | No core. |
| 79.4 | .8 | Clay. Olive-gray (5Y 3/2) to moderate olive-brown (5Y 4/4) to greenish-gray (5G 6/1) to dark greenish-gray (5G 4/1) to dusky-yellow (5Y 6/4) finely laminated clay. |
| 82.0 | 2.6 | Clay and gaylussite. Dark greenish-gray (5G 4/1) to greenish-gray (5G 6/1) to grayish-black (N 2) to dark-gray (N 3) to olive-gray (5Y 3/2) to moderate olive-brown (5Y 4/4) to dusky-yellow (5Y 6/4) to grayish-yellow (5Y 8/4) to very light gray (N 8) finely laminated clay with scattered pockets of subhedral to anhedral gaylussite crystals averaging 15 mm in length. Clay 95 percent, gaylussite 5 percent. |
| 82.1 | .1 | No core. |

Searles drill hole GS-26

LOCATION: Searles Lake, Calif., about 800 ft S. 74° E. of center sec. 30, T. 25 S., R. 44 E., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,617 ft.

ELEVATION AT BOTTOM OF HOLE: 1,532 ft.

TOTAL DEPTH: 85.0 ft.

DATES DRILLED: July 27 to Aug. 12, 1955.

CASING USED: 20.0 ft of 16-in. casing; 58.8 ft of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 0.2 | 0.2 | Overburden mud, not cored. Grayish-olive (10Y 4/2) to dusky-yellow (5Y 6/4) soft tenacious clay. |
| 1.5 | 1.3 | Overburden mud, not cored. Poorly consolidated aggregate of colorless anhedral to subhedral halite crystals up to 80 mm in length, averaging 50 mm, with 10 percent interstitial grayish-olive (10Y 4/2) clay. |
| 9.2 | 7.7 | Overburden mud, not cored. Dusky yellow-green (5GY 5/2) clay with irregular streaks of grayish-black (N 2) clay. |
| 11.0 | 1.8 | Overburden mud, not cored. Black (N 1) to grayish-black clay with irregular streaks of dusky yellow-green (5GY 5/2) clay. |
| 15.8 | 4.8 | Overburden mud, not cored. Black (N 1) dense tenacious clay. |
| 17.9 | 2.1 | Overburden mud, not cored. Black (N 1) clay with local dusky yellowish-green (10GY 3/2) clay streaks; a few streaks and pockets of disseminated anhedral pirssonite* crystals averaging 1 mm in length; pocket, 10 mm wide, of 75 percent disseminated colorless trona blades averaging 2 mm in length at 17.4 ft. Clay 95 percent, pirssonite 5 percent. |
| 18.2 | .3 | Overburden mud, not cored. Fragments of well-consolidated densely packed very slightly vuggy colorless to yellowish-gray (5Y 8/1) fibrous to fine-bladed trona, blades averaging 2 mm in length, locally discolored dark-gray (N 3) by trace of interstitial clay. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 19.0 | 0.8 | Trona, clay, and sulfohalite. Fractured core. Fragments of well-consolidated moderately vuggy white (<i>N</i> 9) massive to colorless trona blades averaging 3 mm in length, generally discolored dark-gray (<i>N</i> 3) to grayish-black (<i>N</i> 2) by 5 percent interstitial clay; numerous lenticular horizontal vugs lined with colorless trona blades; a few loose yellowish sulfohalite octahedra 4 mm in length. |
| 19.6 | .6 | Trona and clay. Well-consolidated slightly vuggy aggregate of colorless trona blades averaging 2 mm in length, generally discolored dark-gray (<i>N</i> 3) by 1 percent interstitial clay; seam, 5 mm wide, of black (<i>N</i> 1) clay with 10 percent disseminated colorless trona blades, averaging 2 mm in length, at base. Trona 96 percent, clay 4 percent. |
| 19.8 | .2 | Trona and clay. Well-consolidated very light gray (<i>N</i> 8) to light-gray (<i>N</i> 7) slightly vuggy massive trona, discolored dark gray (<i>N</i> 3) by 5 percent intermixed clay in upper 10 mm; lenticular horizontal vugs and pockets lined with colorless fine trona blades averaging 2 mm in length. |
| 21.9 | 2.1 | Hanksite and halite. Well-consolidated vuggy aggregate of subhedral to euhedral yellowish to colorless hanksite crystals from 2 to 25 mm in length, averaging 15 mm; irregular 4-in. pocket, at 21.3 to 21.5 ft, of colorless halite cubes and cubes modified by octahedron, averaging 3 mm in length. Hanksite 98 percent, halite 2 percent. |
| 24.1 | 2.2 | No core. |
| 24.6 | .5 | Halite and hanksite. Well-consolidated moderately vuggy aggregate of colorless glassy halite subhedra from 5 to 45 mm in length, averaging 25 mm, with seam, 20 mm wide, consisting of aggregates of anhedral to subhedral dense colorless to moderate-brown (5YR 4/4) hanksite crystals at top, with scattered irregular pockets of similar hanksite crystals throughout; vugs lined with colorless euhedral hanksite crystals, up to 12 mm in length, averaging 5 mm. Halite 80 percent, hanksite 20 percent. |
| 25.1 | .5 | Hanksite. Well-consolidated slightly vuggy dense aggregate of subhedral colorless to light-smoky hanksite crystals averaging 4 mm in length, with vuggy pockets lined with euhedral hanksite crystals up to 10 mm in length. |
| 25.5 | .4 | Hanksite and halite. Well-consolidated moderately vuggy aggregate of dark-smoky anhedral to subhedral hanksite crystals, averaging 4 mm in length; irregular streaks and pockets of friable colorless halite cubes and subhedra, averaging 2 mm in length; vugs lined with colorless to light-smoky euhedral hanksite crystals up to 15 mm in length, averaging 5 mm; trace of interstitial black (<i>N</i> 1) clay. Hanksite 95 percent, halite 5 percent. |
| 26.3 | .8 | Halite and hanksite. Well-consolidated moderately vuggy dense aggregate of anhedral colorless halite crystals averaging 3 mm in length, with vuggy pockets of colorless faint-yellowish euhedral hanksite crystals averaging 10 mm in length; local traces of interstitial black (<i>N</i> 1) clay. Halite 90 percent, hanksite 10 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 27.6 | 1.3 | Hanksite and sulfohalite*. Well-consolidated moderately vuggy dense aggregate of anhedral to subhedral faint-yellowish to dark-smoky hanksite approaching granular texture, with vuggy pockets lined with euhedral hanksite crystals averaging 10 mm in length; single subhedral transparent pale yellowish-orange (10YR 8/6) sulfohalite* crystal 21 mm in length, at 26.7 ft. |
| 28.8 | 1.2 | No core. |
| 31.8 | 3.0 | Hanksite, halite, and trona. Well-consolidated vuggy dense granular aggregate of light- to dark-smoky anhedral to subhedral hanksite crystals, averaging 4 mm in length, with large vuggy pockets lined with euhedral light-smoky hanksite crystals up to 20 mm in length, averaging 10 mm; irregular 6-in. pockets of friable aggregate of colorless halite cubes averaging 2 mm in length, with 10 percent interstitial white trona in upper 0.4 ft; fine colorless fibrous to white (N 9) massive trona locally present in vugs; large euhedral hanksite crystals up to 40 mm in length from 30.0 to 30.4 ft. Hanksite 96 percent, halite 3 percent, trona 1 percent. |
| 32.5 | .7 | Hanksite, trona, and sulfohalite. Well-consolidated slightly vuggy aggregate of euhedral to subhedral to anhedral light-smoky hanksite crystals averaging 5 mm in length, with 10 percent interstitial fine colorless fibrous to yellowish-gray (5Y 8/2) massive trona; a few scarce sulfohalite octahedra up to 7 mm in length. |
| 32.8 | .3 | Hanksite and trona. Fractured core. Fragments of slightly vuggy euhedral to anhedral light-smoky hanksite crystals averaging 5 mm in length, with 10 percent interstitial colorless fine fibrous to yellowish-gray (5Y 7/2) massive trona; fragments of white (N 9) soft massive trona containing 15 percent disseminated anhedral colorless hanksite crystals averaging 1 mm in length. Hanksite 85 percent, trona 15 percent. |
| 37.0 | 4.2 | No core. |
| 37.9 | .9 | Halite, trona, and hanksite. Unconsolidated aggregate of colorless halite sand with 10 percent interstitial white (N 9) to yellowish-gray (5Y 8/1) massive trona; scattered fragments of well-consolidated dense anhedral to subhedral light-smoky hanksite crystal aggregates. Probably cuttings, not core. |
| 38.1 | .2 | Trona. Well-consolidated white (N 9) porous massive trona. |
| 38.4 | .3 | Trona. Well-consolidated colorless to white (N 9) slightly vuggy porous fine fibrous trona. |
| 39.6 | 1.2 | Trona. Well-consolidated white (N 9) porous massive trona with a few seams from 2 to 20 mm wide discolored pale olive (10Y 6/2) to grayish-olive (10Y 4/2) to light olive-gray (5Y 5/2) by trace of intermixed clay. |
| 41.8 | 2.2 | No core. |
| 41.9 | .1 | Borax and clay. Friable aggregate of colorless euhedral to subhedral borax crystals from 1 to 5 mm in length, averaging 3 mm, with 10 percent interstitial black (N 1) clay chiefly confined to lower 10 mm. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 42.1 | 0.2 | Clay and pirssonite. Black (<i>N</i> 1) clay with 20 percent disseminated euhedral pirssonite crystals averaging 1 mm in length. |
| 42.6 | .5 | Clay and pirssonite. Grayish-black (<i>N</i> 2) to grayish olive-green (<i>5GY</i> 3/2) to grayish-green (<i>5G</i> 5/2) to dusky-yellow (<i>5Y</i> 6/4) to moderate olive-brown (<i>5Y</i> 4/4) to medium bluish-gray (<i>5B</i> 5/1) to finely laminated clay with irregular seams and pockets of anhedral to subhedral pirssonite crystals averaging 5 mm in length. Clay 90 percent, pirssonite 10 percent. |
| 43.4 | .8 | Clay and pirssonite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay, locally grayish-green (<i>10GY</i> 5/2) to dusky yellow-green (<i>5GY</i> 5/2) to olive-gray (<i>5Y</i> 3/2) finely laminated clay with 35 percent disseminated subhedral pirssonite crystals 5 to 20 mm in length, averaging 10 mm. |
| 44.2 | .8 | Clay and gaylussite*. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to grayish-yellow (<i>5Y</i> 8/4) to dusky-yellow (<i>5Y</i> 6/4) to olive-gray (<i>5Y</i> 3/2) to greenish-gray (<i>5G</i> 6/1) to grayish yellow-green (<i>5GY</i> 7/2) finely laminated clay with large pockets of disseminated subhedral gaylussite* crystals up to 30 mm in length, averaging 15 mm. Clay 80 percent, gaylussite 20 percent. |
| 45.7 | 1.5 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to grayish olive-green (<i>5GY</i> 3/2) clay with fine widely spaced dusky yellow-green (<i>5GY</i> 5/2) to grayish-yellow (<i>5Y</i> 8/4) to very light gray (<i>N</i> 8) laminae. Core fractured in upper 0.4 ft. |
| 46.1 | .4 | Clay, gaylussite*, and aragonite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with laminae, averaging 1 mm wide, of very light gray (<i>N</i> 8) soft massive finely crystalline aragonite; 40 percent disseminated subhedral gaylussite* crystals averaging 10 mm in length. Clay 55 percent, gaylussite 40 percent, aragonite 5 percent. |
| 48.2 | 2.1 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to dusky-yellow (<i>5Y</i> 6/4) to grayish-yellow (<i>5Y</i> 8/4) to olive-gray (<i>5Y</i> 3/2) to greenish-gray (<i>5GY</i> 6/1) to very light gray (<i>N</i> 8) finely laminated clay with scattered 1- to 3-in. pockets of disseminated anhedral to subhedral gaylussite* crystals averaging 5 mm in length; seam, 20 mm wide, of disseminated gaylussite crystals at 47.8 ft; laminae wavy to contorted and faulted in lower 0.2 ft. Clay 95 percent, gaylussite 5 percent. |
| 48.8 | .6 | No core. |
| 50.4 | 1.6 | Clay and gaylussite*. Greenish-gray (<i>5G</i> 6/1) to dark greenish-gray (<i>5G</i> 4/1) to grayish-black (<i>N</i> 2) to grayish-olive (<i>10Y</i> 4/2) to dusky-yellow (<i>5Y</i> 6/4) to grayish-yellow (<i>5Y</i> 8/4) to very pale gray (<i>N</i> 8) finely laminated clay with 2- to 3-in. pockets of subhedral to anhedral gaylussite* crystals averaging 10 mm in length; seam, 3 mm wide, of 75 percent disseminated euhedral gaylussite sand at 50.0 ft. Clay 95 percent, gaylussite 5 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 50.8 | 0.4 | Clay, gaylussite, and aragonite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with laminae, averaging 1 mm wide, of dusky-yellow (5Y 6/4) to very light gray (<i>N</i> 8) soft finely crystalline massive aragonite; seams, averaging 5 mm in width, of disseminated subhedral to anhedral gaylussite crystals averaging 10 mm in length. Clay 80 percent, gaylussite 15 percent, aragonite 5 percent. |
| 51.3 | .5 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) to greenish-gray (5G 6/1) coarsely laminated clay revealed by color differences, with 20 percent disseminated anhedral to subhedral gaylussite crystals averaging 10 mm in length; a few distinct laminae, averaging 0.3 mm in width, of moderate reddish-brown (10R 4/6) algae(?) discolored clay. |
| 51.7 | .4 | Clay, gaylussite, and borax. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with 5 percent disseminated gaylussite silt; vague light-brown (5YR 5/6) algae(?) discolorations; irregular wavy streak, 5 mm wide, of massive anhedral borax in lower 0.1 ft. Clay 92 percent, gaylussite 5 percent, borax 3 percent. |
| 53.2 | 1.5 | No core. |
| 54.8 | 1.6 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-black (5GY 2/1) to greenish-gray (5G 6/1) to dark greenish-gray (5G 4/1) coarsely laminated clay revealed by color differences, with 30 percent disseminated euhedral clear colorless gaylussite crystals from medium-sand size to 10 mm in length, averaging 5 mm; distinct laminae, 2 mm in width, of intermixed moderate reddish-brown (10R 4/6) algae(?) at top with faint laminae and streaks at 53.9 and 54.5 ft. |
| 56.4 | 1.6 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-gray (5GY 6/1 and 5G 6/1) coarsely laminated clay revealed by color differences, with 3 percent disseminated gaylussite silt chiefly confined to upper 0.2 ft; faint moderate reddish-brown (10R 4/6) algae(?)—discolored laminae at 55.6 to 55.7 ft. |
| 57.0 | .6 | Clay, pirssonite, and trona. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with 40 percent disseminated euhedral pirssonite crystals from fine sand size to 5 mm in length, averaging 3 mm; embedded fractured fragments of white (<i>N</i> 9) soft massive trona to well-consolidated vuggy aggregates of trona blades, averaging 10 mm in length, in lower 0.1 ft. Clay 52 percent, pirssonite 40 percent, trona 8 percent. |
| 57.4 | .4 | Trona and clay. Well-consolidated slightly vuggy aggregate of yellowish-gray (5Y 8/1) massive trona, generally discolored medium light-gray (<i>N</i> 6) to dark-gray (<i>N</i> 3) by intermixed clay; vuggy pockets of trona blades, averaging 5 mm in length, with trace of interstitial black (<i>N</i> 1) clay throughout. Trona 95 percent, clay 5 percent. |
| 57.5 | .1 | Borax. Vuggy aggregate of colorless euhedral to subhedral borax crystals from 20 to 80 mm in length. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 57.8 | 0.3 | Trona and clay. Well-consolidated vuggy porous aggregate of colorless trona blades from 10 to 35 mm in length, averaging 15 mm, with irregular streaks of yellowish-gray (5Y 8/1) hard massive trona; 5 percent interstitial black (N 1) clay. |
| 58.4 | .6 | Clay and pirssonite. Black (N 1) to olive-gray (5Y 3/2) clay with 35 percent disseminated euhedral pirssonite crystals averaging 4 mm in length. |
| 58.5 | .1 | Clay and pirssonite. Black (N 1) to grayish-black (N 2) clay with streaks of disseminated euhedral pirssonite sand. Clay 90 percent, pirssonite 10 percent. |
| 60.2 | 1.7 | Clay, pirssonite, and borax. Black (N 1) to greenish-black (5GY 2/1) moist poorly consolidated clay with a few greenish-gray (5G 6/1) to dusky yellow-green (5GY 5/2) clay streaks; 35 percent disseminated euhedral pirssonite crystals from 1 to 15 mm in length, averaging 10 mm; a few disseminated subhedral borax crystals averaging 40 mm in length. Clay 62 percent, pirssonite 35 percent, borax 3 percent. |
| 60.8 | .6 | Trona. Well-consolidated white (N 9) to yellowish-gray (5Y 8/1) soft massive to colorless fine fibrous trona, locally discolored dark-gray (N 3) by trace of intermixed clay. |
| 62.2 | 1.4 | No core. |
| 62.6 | .4 | Trona and clay. Poorly consolidated dark greenish-gray (5GY 4/1) to dark-gray (N 3) soft massive to colorless fine fibrous trona, discolored by 1 percent intermixed black (N 1) clay. May be cuttings, not core. |
| 62.8 | .2 | Trona. Well-consolidated white (N 9) massive trona, locally discolored dark-gray (N 3) in streaks by trace of intermixed clay; distinct moderate reddish-orange (10R 6/6) algae(?) - discolored seams, 3 mm in width, at 62.7 ft. |
| 63.1 | .3 | Trona. Well-consolidated white (N 9) to dark greenish-gray (5G 4/1) slightly vuggy massive trona, locally discolored dark-gray (N 3) by trace of intermixed clay; vugs lined with colorless fine fibrous trona. |
| 64.9 | 1.8 | Clay, gaylussite*, and borax. Black (N 1) to grayish-black (N 2) to greenish-black (5GY 2/1) moist poorly consolidated clay with numerous seams, 0.5 to 1 mm thick, of pale greenish-yellow (10Y 8/2) anhedral gaylussite*; 35 percent disseminated euhedral to subhedral gaylussite crystals averaging 5 mm; a few disseminated subhedral borax crystals averaging 40 mm throughout. Clay 59 percent, gaylussite 40 percent, borax 1 percent. |
| 65.2 | .3 | Clay and pirssonite*. Clay as in preceding unit with 40 percent disseminated subhedral pirssonite* crystals. |
| 65.3 | .1 | Clay and pirssonite. Well-consolidated black (N 1) clay with 20 percent disseminated euhedral pirssonite sand. |
| 66.0 | .7 | Trona. Well-consolidated colorless fibrous trona with streaks and pockets of white (N 9) to dark greenish-gray (5GY 4/1) massive trona. |
| 67.7 | 1.7 | No core. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 68. 1 | 0. 4 | Halite and trona. Moderately friable aggregate of colorless halite cubes, cubes modified by octahedron, and subhedra, averaging 3 mm in length, with irregular lenticular streaks, up to 0.1 ft wide, of greenish-gray (5GY 6/1) massive trona in upper 0.1 ft. Halite 80 percent, trona 20 percent. |
| 68. 3 | . 2 | Halite and trona. Well-consolidated aggregate of colorless halite cubes, cubes modified by octahedron, and subhedra, up to 10 mm in length, averaging 3 mm, with 30 percent interstitial greenish-gray (5GY 6/1) massive to fine colorless fibrous trona; a few moderate reddish-orange (10R 6/6) algae(?) inclusions in halite crystals at base. |
| 69. 2 | . 9 | No core. |
| 69. 5 | . 3 | Halite and trona. Moderately friable aggregate of colorless halite cubes modified by octahedron and subhedra, averaging 3 mm in length, with 20 percent yellowish-gray (5Y 8/1) to light-olive (5Y 6/1) massive trona to fine colorless fibrous trona in irregular streaks and interstices of halite; numerous moderate reddish-orange (10R 6/6) pinpoint inclusions of algae(?) in halite; trace of interstitial black (N 1) clay locally. |
| 69. 8 | . 3 | Trona, halite, and clay. Well-consolidated yellowish-gray (5Y 8/1) slightly vuggy soft massive trona to fine fibrous trona; seam, 15 mm wide, of trona discolored dark-gray (N 3) by 5 percent intermixed clay containing 20 percent disseminated colorless halite subhedra averaging 3 mm in length at 69.6 ft. Trona 96 percent, halite 3 percent, clay 1 percent. |
| 70. 6 | . 8 | Halite and trona. Friable aggregate of colorless halite cubes modified by octahedron and subhedra, 2 to 10 mm in length, averaging 5 mm, with 5 percent interstitial fine fibrous trona; trace of black (N 1) clay in upper 0.1 ft. |
| 70. 7 | . 1 | Clay, halite, and trona. Black (N 1) to grayish-black (N 2) clay with faint traces of moderate reddish-brown (10R 4/6) algae(?) discolorations; embedded colorless halite cubes modified by octahedron in upper 10 mm and fine colorless fibrous trona at base. Clay 75 percent, halite 20 percent, trona 5 percent. |
| 71. 1 | . 4 | Trona, clay, and halite. Well-consolidated slightly vuggy white (N 9) massive trona, locally discolored medium dark gray (N 4) by trace of intermixed clay, with irregular pockets and streaks of colorless fibrous trona; 20 percent black (N 1) to grayish-black (N 2) clay in streaks in upper 0.1 ft; seam, 5 mm wide, of 90 percent disseminated colorless halite subhedra averaging 4 mm in length at 71.0 ft. Trona 91 percent, clay 5 percent, halite 4 percent. |
| 71. 5 | . 4 | Halite and trona. Moderately friable aggregate of colorless halite cubes and subhedra, averaging 2 mm in length, with 15 percent interstitial light-gray (N 7) massive trona and a few seams, 3-5 mm wide, of white (N 9) trona. Halite 75 percent, trona 25 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 72.2 | 0.7 | Trona, halite, and burkeite. Well-consolidated slightly vuggy aggregate of yellowish-gray (5Y 8/1) to light-gray (N 8) massive trona in lenticular seams and pockets of colorless halite cubes modified by octahedron and subhedra, averaging 3 mm in length; a few vuggy pockets, 1/2 to 1 in. long, of colorless fibrous trona; irregular pockets, 1-4 in. long, of light grayish-yellow (5Y 8/4) hard massive dense burkeite in lower 0.3 ft; trace of interstitial grayish-black (N 2) clay locally. Trona 50 percent, halite 35 percent, burkeite 15 percent. |
| 72.6 | .4 | Clay, sulfohalite*, northupite*, and tychite*. Well-consolidated black (N 1) to grayish-black (N 2) to dusky-yellow (5Y 6/4) to dusky yellow-green (5GY 5/2) finely laminated clay with a few fine laminae of moderate reddish-brown (10R 4/6) to moderate-red (5R 4/6) algae(?) in upper 0.2 ft; seam, 5 mm wide, at base, containing 75 percent clay, 20 percent grayish-orange (10YR 7/4) soft massive northupite in thin streaks, 1-2 mm wide, and 5 percent crystals, averaging 7 mm in length, of sulfohalite* containing microscopic crystals of northupite* and tychite*. |
| 72.9 | .3 | Trona, borax, and clay. Complex core consisting of seams as follows from top to base: seam, 20 mm wide, of friable colorless euhedral prismatic borax crystals averaging 2 mm in length, with some intermixed fine borax sand; seam, 10 mm wide, of grayish-black (N 2) to very light gray (N 8) finely faintly laminated clay; seam, 20 mm wide, of dusky yellow-green (5GY 5/2) hard massive dense trona with clay seam, 2 mm wide, containing 30 percent euhedral prismatic borax crystals, averaging 2 mm in length, at top, with distinct moderate reddish-brown (10R 4/6) algae(?) discoloration in clay; seam, 20 mm wide, of black (N 1) clay with 50 percent intermixed fibrous trona and 25 percent disseminated euhedral borax crystals averaging 2 mm in length; seam, 20 mm wide, of compact colorless fine fibrous trona. Trona 55 percent, borax 28 percent, clay 17 percent. |
| 74.5 | 1.6 | No core. |
| 75.2 | .7 | Trona. Poorly consolidated yellowish-gray (5Y 8/1) to greenish-gray (5GY 6/1) soft massive trona. May be cuttings, not core. |
| 75.3 | .1 | Burkeite, trona, and northupite. Fractured core. Well-consolidated intermixed irregular streaks of colorless to moderate orange-pink (5YR 8/4) dense hard transparent burkeite, white (N 9) massive trona, and thin seams, averaging 2 mm in width, of yellowish-gray (5Y 8/1) to light-brown (5YR 6/4) massive northupite; a few disseminated colorless subhedral hanksite crystals averaging 4 mm in length. Burkeite 50 percent, trona 35 percent, northupite 15 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 75.7 | 0.4 | Trona and clay. Well-consolidated slightly vuggy aggregate of colorless fine fibrous trona with pockets of white (<i>N</i> 9) massive trona, locally discolored dark-gray (<i>N</i> 3) by trace of intermixed clay; irregular seam, 5 mm wide, containing faint light-brown (5YR 6/4) algae(?) discoloration at 75.5 ft; 10 percent black (<i>N</i> 1) soft moist clay in irregular streaks in lower 0.1 ft. Trona 97 percent, clay 3 percent. |
| 75.8 | .1 | Northupite, clay, trona, and hanksite. Well-consolidated grayish-orange (10YR 7/4) to yellowish-gray (5Y 7/2) soft massive northupite in irregular seam locally mixed with streaks of grayish-black (<i>N</i> 2) clay, colorless fibrous trona, and white (<i>N</i> 9) massive trona; a few disseminated hanksite crystals with basal pinacoid, averaging 3 mm in length, at base. Northupite 70 percent, clay 15 percent, trona 10 percent, hanksite 5 percent. |
| 76.1 | .3 | Clay, hanksite, northupite, and borax. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with disseminated irregular masses, up to 35 mm in length, of granular massive hanksite; a few disseminated euhedral hanksite crystals with basal pinacoid averaging 3 mm in length, frequently intergrown in clusters; a few disseminated anhedral to subhedral borax crystals averaging 10 mm in length; trace of seam, 10 mm wide, of grayish-orange (10YR 7/4) soft massive northupite at base. Clay 55 percent, hanksite 40 percent, northupite 4 percent, borax 1 percent. |
| 76.2 | .1 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to light olive (10Y 5/4) to very light gray (<i>N</i> 8) faintly finely laminated clay; numerous laminae of gaylussite silt. Clay 90 percent, gaylussite 10 percent. |
| 76.6 | .4 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with 50 percent disseminated euhedral to subhedral gaylussite crystals averaging 7 mm in length; seam, 15 mm wide, of 50 percent disseminated euhedral gaylussite crystals averaging 1 mm in length at base. |
| 77.0 | .4 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to very light gray (<i>N</i> 8) faintly finely laminated clay with 5 percent disseminated gaylussite silt. |
| 77.7 | .7 | Clay, trona, and northupite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with 49 percent disseminated colorless trona blades averaging 20 mm in length; irregular wavy streaks of grayish-orange (10YR 7/4) massive northupite in seam, 3 mm wide, at 77.3 ft; traces of moderate reddish-brown (10R 4/6) algae(?) in faint laminae in clay. Clay 50 percent, trona 49 percent, northupite 1 percent. |
| 78.1 | .4 | Trona. Well-consolidated dense aggregate of colorless trona blades averaging 20 mm in length, with interstitial white (<i>N</i> 9) to greenish-gray (5GY 6/1) massive trona. |
| 78.3 | .2 | Trona and northupite. Well-consolidated aggregate of colorless trona blades averaging 20 mm in length, locally in radiating clusters, with irregular wavy seams, from 5 to 20 mm in width, of yellowish-gray (5Y 8/1) to grayish-orange (10YR |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| | | 7/4) massive northupite. Trona 50 percent, northupite 50 percent. |
| 78.6 | 0.3 | Clay, trona, and northupite. Black (N 1) to grayish-black (N 2) clay with faint fine very light gray (N 8) laminae; disseminated round to oval nodules, averaging 0.3 mm in length, of white (N 9) massive northupite arranged in layers; disseminated colorless trona blades, averaging 5 mm in length, in upper 10 mm. Clay 93 percent, trona 5 percent, northupite 2 percent. |
| 78.8 | .2 | Clay and gaylussite. Black (N 1) clay with 50 percent disseminated euhedral gaylussite crystals averaging 1 mm in length, with predominantly fine gaylussite sand in lower 10 mm; soft pliable greenish-black (5GY 2/1) clay seams, averaging 0.5 mm in thickness, in upper 0.1 ft. |
| 78.9 | .1 | Clay. Grayish-black (N 2) to very light gray (N 8) finely laminated clay; laminae wavy and locally contorted. |
| 79.1 | .2 | Trona and clay. Well-consolidated dense aggregate of colorless trona blades, averaging 25 mm in length, with 30 percent interstitial grayish-black (N 2) clay in upper 20 mm. |
| 79.3 | .2 | Trona and clay. Well-consolidated white (N 9) massive to colorless fine fibrous trona with irregular seam, 5 mm wide, of 25 percent grayish-black (N 2) clay at 79.2 ft. Trona 98 percent, clay 2 percent. |
| 79.5 | .2 | No core. |
| 79.9 | .4 | Clay, trona, northupite*, and hanksite*. Black (N 1) to grayish-black (N 2) clay with seam, 5 mm wide, of very pale orange (10YR 8/2) soft massive northupite* at top and seam, 2 mm wide, of pale olive (10Y 6/2) soft massive northupite at 79.6 ft; a few scattered 1/2- to 1-in. pockets of colorless to grayish-yellow (5Y 8/4) fine fibrous trona associated with colorless to light-smoky subhedral to anhedral hanksite* crystals averaging 5 mm in length; irregular seam, 5-15 mm wide, of fine fibrous trona at base; core fractured in lower 0.2 ft. Clay 83 percent, trona 10 percent, northupite 6 percent, hanksite 1 percent. |
| 80.0 | .1 | Clay. Black (N 1) to grayish-black (N 2) clay. |
| 80.2 | .2 | Clay and northupite. Grayish-black (N 2) clay with faint fine very light gray (N 8) laminae; numerous disseminated round to oval nodules, averaging 0.2 mm in length of white (N 9) massive northupite arranged in layers. Clay 90 percent, northupite 10 percent. |
| 80.5 | .3 | Clay. Grayish-black (N 2) to very light gray (N 8) finely laminated clay. |
| 81.1 | .6 | Clay and gaylussite. Olive-gray (5Y 3/2) to moderate olive-brown (5Y 4/4) to grayish-black (N 2) clay with 50 percent disseminated euhedral to subhedral gaylussite crystals averaging 10 mm in length. |
| 81.8 | .7 | Clay. Grayish-black (N 2) to dark greenish-gray (5GY 4/1) to dusky yellow-green (5GY 5/2) to dusky-yellow (5Y 6/4) to very light gray (N 8) finely laminated clay; laminae faulted with measured 10-mm displacement down dip; a few seams of disseminated gaylussite silt. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 82.0 | 0.2 | Clay. Grayish-black (<i>N</i> 2) clay. |
| 82.2 | .2 | Clay and trona*. Grayish-black (<i>N</i> 2) clay with 50 percent disseminated white (<i>N</i> 9) to dusky yellow-green (<i>5GY</i> 5/2) sugary-textured massive trona* in irregular streaks and ¼- to ½-in. pockets; traces of moderate reddish-brown (<i>10R</i> 4/6) clay discolored by algae(?). |
| 82.6 | .4 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to greenish-gray (<i>5G</i> 6/1) to very light gray (<i>N</i> 8) faintly finely laminated clay with 10 percent disseminated gaylussite silt in lower 0.1 ft. |
| 84.5 | 1.9 | Clay and gaylussite. Greenish-gray (<i>5GY</i> 6/1 and <i>5G</i> 6/1) to dark greenish-gray (<i>5GY</i> 4/1 and <i>5G</i> 4/1) to olive-gray (<i>5Y</i> 3/2) to moderate olive-brown (<i>5Y</i> 4/4) to dusky-yellow (<i>5Y</i> 6/4) to grayish-black (<i>N</i> 2) finely laminated clay with 35 percent disseminated euhedral to subhedral gaylussite crystals from 0.5 to 30 mm in length, averaging 20 mm. |
| 85.0 | .5 | No core. |

Searles drill hole GS-39

LOCATION: Searles Lake, Calif., 20 ft southwest of ¼ sec. marker for secs. 9 and 10, in sec. 9, T. 25 S., R. 43 E., Mount Diablo base line and meridian.

ELEVATION AT TOP OF HOLE: 1,621 ft.

ELEVATION AT BOTTOM OF HOLE: 1,538.2 ft.

TOTAL DEPTH: 82.8 ft.

DATES DRILLED: Oct. 6-19, 1955.

CASING USED: 24.0 ft of 16-in. casing; 54.7 ft of 3-in. pipe.

MINERAL DETERMINATIONS: Minerals identified microscopically are denoted by an asterisk (*).

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 7.0 | 7.0 | Overburden mud, not cored. Moderate yellowish-brown (<i>10YR</i> 5/4) sandy clay; clayey sand at 2.0 to 3.0 ft. |
| 11.0 | 4.0 | Overburden mud, not cored. Dark greenish-gray (<i>5G</i> 4/1) clay. |
| 23.5 | 12.5 | Clay and trona, not cored. Black (<i>N</i> 1) clay with hard seam of trona blades beginning at 22.5 ft. |
| 24.1 | .6 | No core. |
| 25.5 | 1.4 | Trona and clay. Well-consolidated slightly vuggy aggregate of colorless trona blades averaging 3 mm in length, locally discolored medium light-gray (<i>N</i> 6) to dark-gray (<i>N</i> 3) by 1 percent interstitial black (<i>N</i> 1) clay; irregular seam, up to 0.1 ft wide, of black (<i>N</i> 1) clay at 24.5 to 24.6 ft. Trona 95 percent, clay 5 percent. |
| 27.5 | 2.0 | Trona*, clay, sulfahalite*, and pirssonite*. Well-consolidated slightly vuggy aggregate of colorless fibrous trona, locally discolored medium-gray (<i>N</i> 5) by trace of interstitial clay; seam, 15 mm wide, of black (<i>N</i> 1) clay with streaks of yellowish-gray (<i>5Y</i> 8/1) massive trona at 27.1 ft, with 10 percent disseminated crystal silt consisting mainly of trona* with intermediate amounts of sulfahalite* and pirssonite*. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 28.0 | 0.5 | Trona and clay. Fractured core. Fragments of loosely consolidated porous colorless fibrous trona, discolored medium dark-gray (N 4) by 1 percent interstitial clay. |
| 31.7 | 3.7 | Trona. Well-consolidated white (N 9) soft massive trona with a few seams, 3-40 mm wide, discolored light olive-gray (5Y 6/1) by trace of intermixed clay; moderately vuggy in upper 0.4 ft, with lenticular horizontal vugs lined with colorless fine fibrous trona. |
| 34.0 | 2.3 | No core. |
| 34.4 | .4 | Trona and borax. Fractured core. Well-consolidated seams, 2-10 mm wide, of white (N 9) massive trona with seams, 1-2 mm wide, of light olive-gray (5Y 6/1) trona discolored by trace of intermixed clay; seams are wavy in lower 0.2 ft; 10 percent disseminated anhedral colorless borax crystals, averaging 30 mm in length, in lower 0.1 ft. Trona 97 percent, borax 3 percent. |
| 35.5 | 1.1 | No core. |
| 36.8 | 1.3 | Clay, pirssonite*, and borax. Black (N 1) to grayish-black (N 2) clay with 35 percent disseminated anhedral pirssonite crystals averaging 5 mm in length; single subhedral borax crystal 60 mm in length at base. |
| 37.2 | .4 | Clay and borax. Grayish-black (N 2) to dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/1) to very light gray (N 8) finely laminated clay; single embedded euhedral borax crystal 60 mm in length, at 37.1 ft. |
| 37.6 | .4 | Clay and pirssonite. Black (N 1) to olive-black (5Y 2/1), locally dusky yellow-green (5GY 5/2) to grayish olive-green (5GY 3/2) to very light gray (N 8), finely laminated clay with 40 percent disseminated subhedral pirssonite crystals up to 25 mm in length, averaging 5 mm. |
| 37.8 | .2 | Clay. Grayish-black (N 2) to olive-black (5Y 2/1) to dusky yellow-green (5GY 5/2) to very light gray (N 8) finely laminated clay. |
| 39.2 | 1.4 | Clay. Black (N 1) to grayish-black (N 2) clay with widely separated fine pale greenish-yellow (10Y 8/2) laminae. |
| 39.9 | .7 | Clay and aragonite. Black (N 1) to grayish-black (N 2) clay coarsely laminated with very light gray (N 8) to pale greenish-yellow (10Y 8/2) to greenish-gray (5GY 6/1) laminae up to 1 mm wide, averaging 0.5 mm, of finely crystalline massive aragonite. Clay 95 percent, aragonite 5 percent. |
| 41.1 | 1.2 | Clay and gaylussite*. Grayish-black (N 2) to olive-gray (5Y 3/2) to dusky-yellow (5Y 6/4) to grayish-yellow (5Y 8/4) to very light gray (N 8) finely laminated clay; laminae contorted in lower 0.4 ft; 40 percent disseminated subhedral gaylussite* crystals 10-30 mm in length, averaging 10 mm, in irregular pockets in lower 0.2 ft. Clay 93 percent, gaylussite 7 percent. |
| 41.5 | .4 | No core. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 42.9 | 1.4 | Clay and borax. Grayish-black (N 2) to dark greenish-gray (5GY 4/1) to greenish-gray (5GY 6/1) to dusky-yellow (5Y 6/4) to grayish-orange (10YR 7/4) to very light gray (N 8) finely laminated clay; 10 percent disseminated subhedral borax crystals, averaging 15 mm in length, in irregular pockets from 41.8 to 41.9 ft. |
| 43.4 | .5 | Clay and aragonite. Grayish-black (N 2) to olive-black (5Y 2/1) to yellowish-gray (5Y 8/1) clay, moderately coarsely laminated, with laminae up to 1 mm wide, of very light-gray (N 8) soft massive finely crystalline aragonite. |
| 44.3 | .9 | No core. |
| 44.5 | .2 | Pirssonite and clay. Black (N 1) clay with 60 percent anhedral to subhedral pirssonite seams averaging 1 mm in width. |
| 44.8 | .3 | Clay and aragonite. Grayish-black (N 2) to dark greenish-gray (5GY 4/1) moderately coarsely laminated clay with seams of very light gray (N 8) soft massive finely crystalline aragonite. |
| 45.0 | .2 | Clay. Black (N 1) to grayish-black (N 2) to dusky yellow-green (5GY 5/2) to dark greenish-gray (5G 4/1) to dusky-yellow (5Y 6/4) finely laminated clay. |
| 45.2 | .2 | Clay and aragonite. Grayish-black (N 2) to dark greenish-gray (5GY 4/1) moderately coarsely laminated clay with laminae of very light gray (N 8) soft massive finely crystalline aragonite. |
| 45.5 | .3 | Clay. Black (N 1) to grayish-black (N 2) to dusky yellow-green (5GY 5/2) to dark greenish-gray (5G 4/1) to dusky-yellow (5Y 6/4) finely laminated clay. |
| 47.0 | 1.5 | Clay. Grayish-black (N 2) to dark greenish-gray (5GY 4/1) to grayish olive-green (5GY 3/2) to dusky-yellow (5Y 6/4) to moderate olive-brown (5Y 4/4) coarsely laminated clay revealed by color differences. |
| 47.6 | .6 | No core. |
| 51.1 | 3.5 | Clay, gaylussite*, and borax*. Grayish-black (N 2) to dark greenish-gray (5GY 4/1 and 5G 4/1) faintly laminated clay with scattered 2- to 3-in. pockets and disseminated crystals of anhedral gaylussite*; disseminated pockets of colorless subhedral borax* crystals up to 35 mm in length; a few faint moderate reddish-brown (10R 4/6) algae(?)-discolored laminae averaging 0.3 mm wide. Clay 90 percent, gaylussite percent, borax 5 percent. |
| 52.4 | 1.3 | Clay and gaylussite. Grayish-black (N 2) to dark greenish-gray (5GY 4/1 and 5G 4/1) clay with seams, up to 0.2 ft wide, of disseminated euhedral gaylussite crystals from 1 to 15 mm in length, averaging 10 mm; a few faint moderate reddish-brown (10R 4/6) algae(?) -discolored laminae. Clay 75 percent, gaylussite 25 percent. |
| 53.2 | .8 | No core. |
| 53.4 | .2 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) clay with 25 percent disseminated euhedral to subhedral gaylussite crystals from 1 to 10 mm long. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 53.5 | 0.1 | Trona and clay. Well-consolidated porous aggregate of colorless fibrous trona with 20 percent black (N 1) clay in irregular streaks and pockets. |
| 53.7 | .2 | Clay and gaylussite. Black (N 1) clay with 10 percent disseminated gaylussite silt. |
| 54.4 | .7 | Clay and gaylussite. Black (N 1) to olive-gray (5Y 3/2) to dusky-yellow (5Y 6/4) to dusky yellow-green (5GY 5/2) clay with 50 percent disseminated subhedral gaylussite crystals averaging 5 mm in length. |
| 54.9 | .5 | Clay and gaylussite. Dusky yellow-green (5GY 5/2) to grayish-black (N 2) to greenish-gray (5G 6/1) faintly laminated clay with 20 percent disseminated subhedral gaylussite crystals 1-10 mm in length, averaging 5 mm. |
| 56.4 | 1.5 | Clay and gaylussite. Black (N 1) to olive-gray (5Y 3/2) to dark greenish gray (5GY 4/1) clay with 50 percent disseminated euhedral to subhedral gaylussite crystals 1-15 mm in length, averaging 10 mm; faint moderate reddish-brown (10R 4/6) algae(?)-discolored laminae and irregular discolorations from 56.1 to 56.2 ft. |
| 56.9 | .5 | Clay and gaylussite. Grayish-black (N 2) clay with 20 percent disseminated gaylussite silt in fine streaks and seams throughout; faint moderate reddish-brown (10R 4/6) algae(?)-discolored seams and irregular discolorations throughout. |
| 57.2 | .3 | Trona and clay. Well-consolidated aggregate of colorless to white (N 9) fine fibrous to massive trona with 5 percent black (N 1) clay in irregular thin interstitial streaks. |
| 58.2 | 1.0 | Trona. Well-consolidated white (N 9) to light olive-gray (5Y 6/1) to greenish-gray (5GY 6/1) massive trona with irregular vuggy pockets and streaks of colorless fibrous trona, fibers up to 20 mm in length, averaging 5 mm; traces of interstitial black (N 1) clay locally present in vugs with fibrous trona. |
| 58.7 | .5 | No core. |
| 59.7 | 1.0 | Trona and clay. Well-consolidated slightly vuggy aggregate of white (N 9) to yellowish-gray (5Y 8/1) massive trona, locally discolored medium light gray (N 6) by trace of intermixed clay; pockets and irregular streaks and thin seams, 2-3 mm wide, of colorless fibrous trona with local interstitial black (N 1) clay; faint to distinct moderate reddish-brown (10 R 4/6) to orange algae(?)-discolored seams from 59.0 to 59.4 ft. Trona 99 percent, clay 1 percent. |
| 60.5 | .8 | Clay, gaylussite and northupite. Black (N 1) soft friable clay with 40 percent disseminated fine to coarse euhedral gaylussite sand; irregular seam, up to 15 mm wide, of yellowish-gray (5Y 8/1) to very pale orange (10YR 8/2) soft massive northupite at top. Clay 56 percent, gaylussite 40 percent, northupite 4 percent. |

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| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|---|
| 63.7 | 3.2 | Clay, gaylussite, and borax. Friable black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1) clay, locally dusky yellow-green (<i>5GY</i> 5/2) to dusky-yellow (<i>5Y</i> 6/4) to dark greenish-gray (<i>5G</i> 4/1) to grayish-black (<i>N</i> 2) finely laminated clay in upper 0.4 ft, with 50 percent disseminated euhedral to subhedral gaylussite crystals 2-10 mm in length, averaging 5 mm; a few seams, 1-2 mm wide, of anhedral pale greenish-yellow (<i>10Y</i> 8/2) gaylussite; scattered 2- to 3-in. pockets of disseminated colorless anhedral borax. Clay 49 percent, gaylussite 49 percent, borax 2 percent. |
| 64.0 | .3 | No core. |
| 64.2 | .2 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-gray (<i>5G</i> 6/1) coarsely laminated clay revealed by color differences, with 5 percent disseminated gaylussite silt. |
| 64.3 | .1 | Clay and gaylussite. Dark greenish-gray (<i>5G</i> 4/1) to black (<i>N</i> 1) clay with 50 percent disseminated euhedral gaylussite crystals averaging 1 mm in length. |
| 64.7 | .4 | Clay and gaylussite. Black (<i>N</i> 1) to greenish-black (<i>5GY</i> 2/1) clay with 20 percent disseminated gaylussite silt; faint blackish-red (<i>5R</i> 2/2) algae(?) discolorations throughout. |
| 65.1 | .4 | Trona and clay. Well-consolidated locally densely packed slightly vuggy aggregate of colorless trona blades averaging 10 mm in length, with 50 percent interstitial black (<i>N</i> 1) clay in upper 20 mm and traces of black (<i>N</i> 1) clay throughout. |
| 65.3 | .2 | Trona. Well-consolidated yellowish-gray (<i>5Y</i> 8/1) densely packed fibrous trona with irregular vuggy streaks and pockets of colorless fibrous trona. |
| 65.4 | .1 | Clay and trona. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with irregular streaks of colorless fine fibrous trona; faint to distinct moderate reddish-brown (<i>10R</i> 4/6) algae(?) discolorations. Clay 75 percent, trona 25 percent. |
| 65.8 | .4 | Trona and clay. Fractured core. Well-consolidated white (<i>N</i> 9) massive trona, locally discolored medium light gray (<i>N</i> 6) to intermixed clay; scattered pockets of colorless fine fibrous trona. Trona 99 percent, clay 1 percent. |
| 66.7 | .9 | Trona and clay. Well-consolidated porous aggregate of colorless fibrous trona, locally discolored medium gray (<i>N</i> 5) to dark gray (<i>N</i> 4) by intermixed clay; seam, 20 mm wide, of yellowish-gray (<i>5Y</i> 8/1) massive trona at base. Trona 99 percent, clay 1 percent. |
| 67.2 | .5 | Clay, trona, and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to very light gray (<i>N</i> 8) faintly finely laminated clay with numerous moderate reddish-brown (<i>10R</i> 4/6) algae(?) discolored laminae; lenticular horizontal pocket of colorless fine fibrous trona in lower 0.1 ft; 50 percent disseminated euhedral gaylussite crystals in upper 10 mm. Clay 84 percent, trona 13 percent, gaylussite 3 percent. |
| 67.4 | .2 | Trona and clay. Well-consolidated colorless fibrous trona with seams and irregular streaks of interstitial black (<i>N</i> 1) clay. Trona 97 percent, clay 3 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 67.6 | 0.2 | Trona and clay. Well-consolidated white (N 9) massive to fine fibrous trona, locally discolored orange by intermixed algae(?); thin seams of intermixed black (N 1) clay in lower 0.1 ft with trace of anhydrous borax. Trona 98 percent, clay 2 percent. |
| 68.0 | .4 | Trona and clay. Fractured core. Fragments of white (N 9) massive to colorless fine fibrous trona, locally discolored orange by algae(?); with 35 percent interstitial black (N 1) soft clay. |
| 68.2 | .2 | Trona, northupite, and clay. Colorless to white (N 9) fine fibrous trona with irregular streaks of interstitial yellowish-gray (5Y 8/1) to grayish-orange (10YR 7/4) soft massive northupite chiefly confined to lower 20 mm, associated with 10 percent intermixed streaks of black (N 1) clay. Trona 81 percent, northupite 17 percent, clay 2 percent. |
| 68.9 | .7 | Clay and northupite. Black (N 1) to grayish-black (N 2) to very light gray (N 8) finely laminated clay with 10 percent disseminated round to oval nodules, from 0.2 to 3 mm in length, averaging 1 mm, of white (N 9) massive northupite. |
| 69.1 | .2 | Clay and gaylussite. Black (N 1) to grayish-black (N 2) to very light gray (N 8) finely laminated clay with 20 percent disseminated euhedral gaylussite silt. |
| 70.3 | 1.2 | No core. |
| 70.7 | .4 | Clay, gaylussite, trona, and northupite. Black (N 1) to grayish-black (N 2) to very light gray (N 8) faintly finely laminated clay with 5 percent disseminated gaylussite silt in small 1/4-in. pockets and seams; 5 percent disseminated colorless trona blades up to 80 mm in length; irregular seam, 1-2 mm wide, of grayish-orange (10YR 7/4) massive northupite at 70.6 ft. Clay 89 percent, gaylussite 5 percent, trona 5 percent, northupite 1 percent. |
| 71.2 | .5 | Trona, clay, and gaylussite. Well-consolidated slightly vuggy aggregate of colorless trona blades averaging 30 mm in length, locally in radiating clusters, with 20 percent interstitial grayish-black (N 2) clay containing 10 percent disseminated gaylussite silt; seam, 10 mm wide, of yellowish-gray (5Y 8/1) to medium gray (N 5) hard massive trona at base. |
| 71.6 | .4 | Trona, northupite, and clay. Well-consolidated slightly vuggy porous aggregate of colorless trona blades up to 20 mm in length, averaging 8 mm, with 2- to 3-in. pockets of white (N 9) sugary-textured massive trona; 2 percent interstitial black (N 1) to grayish-black (N 2) clay; lower 20 mm consists of seams of yellowish-gray (5Y 8/1) to grayish-orange (10YR 7/4) soft massive northupite with intermixed very thin streaks and seams of black (N 1) clay. Trona 81 percent, northupite 16 percent, clay 3 percent. |

| Depth (feet) | Unit thick- ness (feet) | Description |
|-----------------|----------------------------|--|
| 72.1 | 0.5 | Clay, gaylussite, and northupite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to dusky yellow-green (5GY 5/2) to very light gray (<i>N</i> 8) finely laminated clay with 10 percent disseminated gaylussite silt; disseminated round to oval nodules, averaging 0.5 mm in length, of white (<i>N</i> 9) to grayish-orange (10YR 7/4) massive northupite chiefly confined to interval 71.8 to 71.9 ft. Clay 87 percent, gaylussite 10 percent, northupite 3 percent. |
| 72.3 | .2 | Gaylussite and clay. Consolidated aggregate of colorless clear euhedral gaylussite crystals, grading from 1 mm in length at top to fine-sand size at base, with 40 percent interstitial black (<i>N</i> 1) clay. |
| 72.6 | .3 | Clay, trona, and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to very light gray (<i>N</i> 8) very finely laminated clay with 1 percent disseminated gaylussite silt in small streaks; 10 percent colorless trona blades averaging, 20 mm in length, disseminated in lower 0.1 ft. Clay 96 percent, trona 3 percent, gaylussite 1 percent. |
| 72.9 | .3 | Trona and clay. Fractured core. Rounded fragments of well-consolidated slightly vuggy white (<i>N</i> 9) to yellowish-gray (5Y 8/1) massive trona with pockets of colorless fibrous trona containing interstitial black (<i>N</i> 1) clay. Trona 99 percent, clay 1 percent. |
| 73.1 | .2 | Clay, trona, and northupite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay; seam, 3 mm wide, at top of fibrous to bladed trona associated with yellowish-gray (5Y 8/1) massive northupite. Clay 96 percent, trona 4 percent, northupite 1 percent. |
| 73.4 | .3 | Clay and northupite. Black (<i>N</i> 1) to greenish-black (5GY 2/1) clay with 10 percent disseminated round to oval nodules, averaging 0.5 mm in length, of white (<i>N</i> 9) massive northupite. |
| 73.7 | .3 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to olive-gray (5Y 3/2) to very light gray (<i>N</i> 8) faintly finely laminated clay with 10 percent disseminated gaylussite silt. |
| 73.8 | .1 | Clay. Poorly consolidated greenish-black (5GY 2/1) soft moist clay, locally finely laminated dark greenish-gray (5G 4/1) to dusky-yellow (5Y 6/4) clay. |
| 73.9 | .1 | Clay and gaylussite. Black (<i>N</i> 1) clay with 50 percent disseminated euhedral gaylussite sand. |
| 74.1 | .2 | Clay. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) to very light gray (<i>N</i> 8) finely laminated clay. |
| 74.4 | .3 | Clay and gaylussite. Black (<i>N</i> 1) to grayish-black (<i>N</i> 2) clay with irregular pockets of fine euhedral gaylussite sand. Clay 95 percent, gaylussite 5 percent. |
| 74.6 | .2 | Clay and gaylussite. Grayish-black (<i>N</i> 2) to greenish-gray (5G 6/1) to dusky-yellow (5Y 6/4) to olive-gray (5Y 3/2) faintly finely laminated clay; 10 percent disseminated gaylussite silt. |

| <i>Depth (feet)</i> | <i>Unit thick- ness (feet)</i> | <i>Description</i> |
|-------------------------|------------------------------------|--|
| 75.0 | 0.4 | Clay and gaylussite. Olive-gray (5Y 3/2) to moderate olive-brown (5Y 4/4) clay with 50 percent disseminated euhedral to subhedral gaylussite crystals up to 50 mm in length, averaging 20 mm. |
| 77.5 | 2.5 | No core. |
| 78.9 | 1.4 | Clay and gaylussite. Grayish-black (N 2) to olive-gray (5Y 3/2) to dusky yellowish-brown (10YR 2/2) clay with 35 percent disseminated euhedral to subhedral gaylussite crystals 5 to 50 mm in length, averaging 25 mm; locally finely laminated greenish-gray (5G 6/1) to dark greenish-gray (5G 4/1) to grayish-black (N 2) to dusky-yellow (5Y 6/4) to dark yellowish-orange (10YR 6/6) clay without gaylussite crystals. |
| 81.9 | 3.0 | Clay, gaylussite, and calcite*. Grayish-black (N 2) to olive-gray (5Y 3/2) to greenish-gray (5GY 6/1) to dark greenish-gray (5GY 4/1) to dusky yellowish-brown (10YR 2/2) to dusky-yellow (5Y 6/4) to dark yellowish-orange (10YR 6/6) to grayish-yellow (5Y 8/4) to very light gray (N 8) finely laminated clay; 5 percent disseminated euhedral gaylussite crystals from sand size to 20 mm in length, averaging 0.5 mm, in thin seams, 3 mm wide, locally cross-cutting laminae; 5 percent disseminated finely crystalline white (N 9) massive calcite* in lenticular pockets 0.5 to 2 mm long, at 81.1 to 81.2 ft. |
| 82.8 | .9 | No core. |

