



CONTACT INFORMATION
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The following file is part of the Walter E. Heinrichs, Jr. Mining Collection

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QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

Re: Longcott - left this on evening for J.M.M.

- 0-9 Top silty soil
- 9-28 Caliche, hard
- 28-40 Clay streaks of fine sand
- 40-58 Sand and gravel
- 53-87 Caliche in clay streaks of fine sand
- 87-123 Sand and gravel and boulders, water 100'
- 123-134 Gravel in clay
- 134-146 Sand and gravel
- 146-157 Brown silty clay
- 157-159 Gravel in caliche in clay, hard
- 159-100 Caliche in red clay
- 190-198 Brown clay and caliche some hard, salt
- 198-254 Gravel and caliche in clay
- 254-262 Red clay
- 262-326 Gravel in silty clay soft
- 326-352 Blue silty clay with red streaks of clay
- 352-354 Coarse sand and pea gravel
- 354-373 Caliche and sand very hard
- 373-397 Brown clay
- 397-421 Gypsum in clay, very hard streaks
- 421-497 Red clay, streaks of gypsum
- 497-526 Conglomerate, hard *gypsum in silty clay*
- 526-537 Gravel in clay and hard stks. of red clay
- 537-572 Conglomerate, very hard, 90% gypsum
- 572-581 Gypsum, 100%
- 581-643 Gypsum in red and blue caly
- 643-663 Brown rock, hard
- 663-682 Talc, white 100%
- 682-688 Loose clay chunks, water showing
- 688-731 Gypsum in clay, very hard
- 731-739 Talc, hard streaks 100%
- 739-744 Gypsum in clay
- 744-755 Talc, a little green in color
- 755-793 Red clay with hard streaks
- 793-818 Gypsum in brown clay

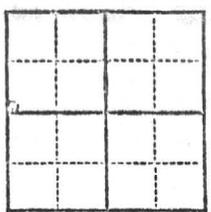
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY (L-2-1) 21k.kk ✓
WATER RESOURCES DIVISION

WELL SCHEDULE
Date July 19, 1962, 19 Field No. 20A

Record by *W. Kam and Cooneyear Farms*
Source of data *W. Kam and Cooneyear Farms*

1. Location: State Arizona County MERICOPA
Map W. Kam and Cooneyear Farms 21 T 2 NR 1 E W
2. Owner: Cooneyear Farms Address _____
Tenant Click Address _____
Driller Click Address _____

3. Topography rolling hills
4. Elevation 1065 ft. above _____
5. Type: Dug, drilled, driven bored, jetted 5 19 62
6. Depth: 102 ft. Meas. _____
7. Casing: Dism. _____ in, to _____ in, Type _____
Depth _____ ft. Finish 537-572
8. Chief Aquifer 337-357-110 From _____ ft. to _____ ft.



9. Water level 105.0 ft. Rept. July 19 day above _____ below _____
which is _____ ft. below surface

10. Pump: Type _____ Capacity _____ G. M.
Power: Kind _____ Horsepower _____
11. Yield: Flow _____ G. M., Pump _____ G. M., Meas., Rept. Est. _____ G. M.
Drawdown _____ ft. after _____ hours pumping _____ G. M.

12. Use: Dom., Stock, PS, RR., Ind., Irr., Obs.
Adequacy, permanence _____
13. Quality _____ Temp _____ °F.
Taste, odor, color _____ Samples No. _____

14. Remarks: (Log, Analyses, etc.) Soil samples collected. Log on back and attached. Soil samples collected. Log on back and attached. Soil samples collected. Log on back and attached.
G. M. R. July 19 1962 GPO 835013

log for well (B-2-1) with

DELLERS LOG

(B-2-1)21abb -- Continued Wells 20A

- 1035-1038 Conglomerate with talc showing strong
- 1038-1059 Gypsum in brown clay and cinders
- 1059-1084 Gypsum in brown clay
- 1084-1087 Brown clay with gray sandy streaks
- 1087-1091 Volcano ash in tight fine sand
- 1091-1099 Brown clay, very hard
- 1099-1105 Decomposed granite in clay, very hard
- 1105-1133 Clay and volcano ash very hard brown
- 1133-1152 Talc in clay (10-15%) Brown clay (1-2%) white
- 1152-1157 Brown clay with blue streaks
- 1157-1159 White clay
- 1159-1173 Hard red clay
- 1173-1185 Dark brown clay sticky
- 1185-1216 Hard brown clay almost rock
- 1216-1252 Hard red clay with blue streaks (salty)
- 1252-1268 Brown clay with very hard streaks
- 1268-1271 Fine pea gravel in clay
- 1271-1281 Brown clay with silty streaks (salty)
- 1281-1324 Blue and brown clay sticky (salty)
- 1324-1388 Blue sticky clay (salty)
- 1388-1428 Hard blue clay streaks of water-crystals
- 1428-1447 Blue clay, very sticky
- 1447-1452 Solid rock salt. Bottom of well.

Original depth 1452'.
Backfilled to 1044'.

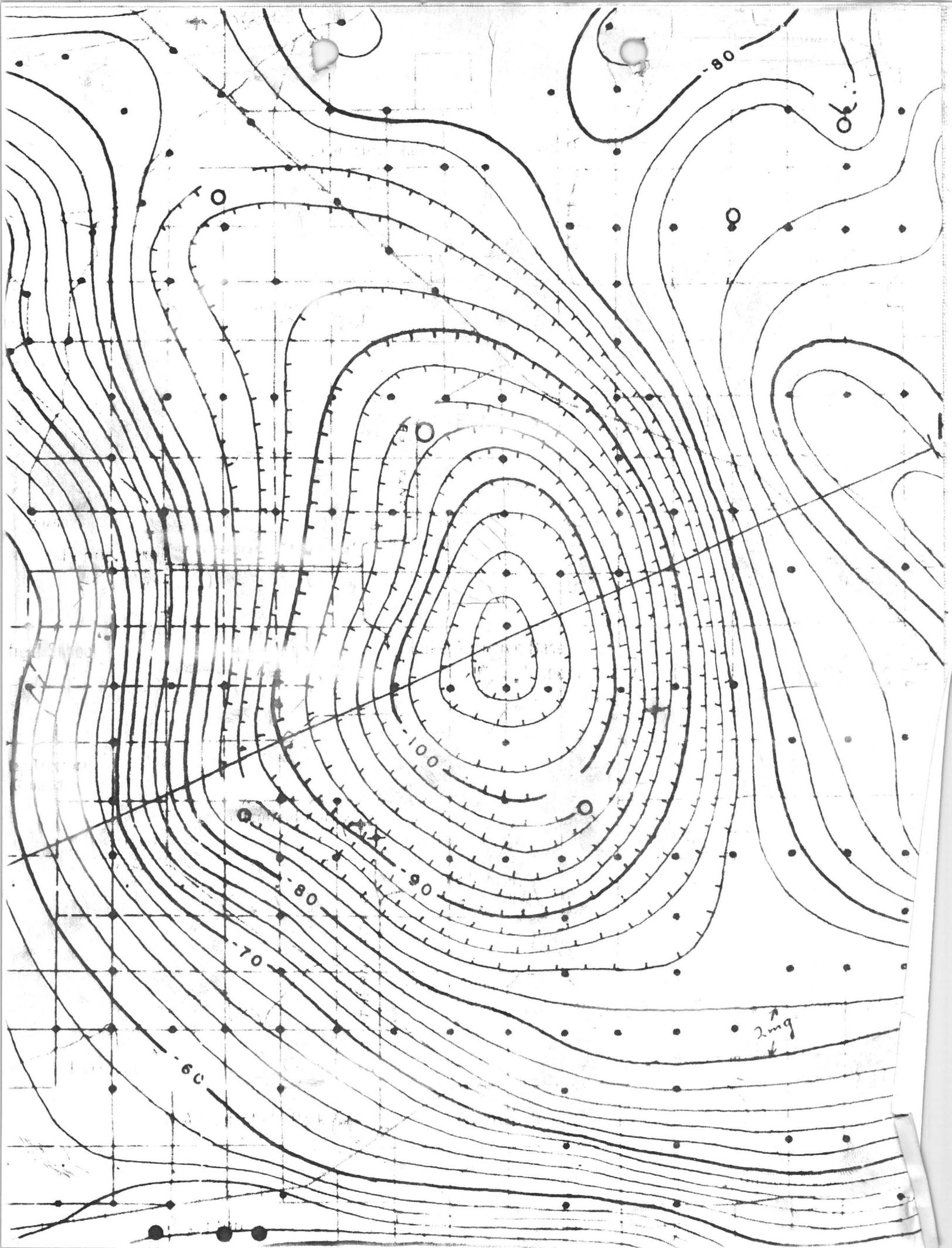
Pump test with bowls set at 300 feet produced about 240 gpm with #30' of drawdown. Specific from regional water table - not an artesian

- 818-825 Talc 100%
- 825-857 Gypsum in brown clay, hard
- 857-863 Talc white, and hard 100%
- 863-892 Brown silty clay
- 892-898 Talc white 100%
- 898-908 Brown silty clay with blue streaks
- 908-917 Gypsum in clay
- 917-919 Talc 100%
- 919-939 Brown silty clay blue streaks
- 939-941 Talc in clay
- 941-959 Gypsum in brown clay
- 959-973 Gypsum and cemented sand very hard
- 973-986 Tough brown clay
- 986-991 Cemented sand very hard
- 991-1002 Gypsum in clay very hard
- 1002-1003 Green tight clay - gypsum
- 1003-1008 Conglomerate very hard & black like lava
- 1008-1035 Conglomerate very hard & black and red, in color and getting harder as we go deeper.
- 1035-1044 Conglomerate.

This well was drilled to a depth of slightly less than 1500 feet. The quality of water at the bottom of hole was reported to be 13000 ppm. The well was plugged to 1044'.

(See attached sheet for rest of log)

1065
1078
1082

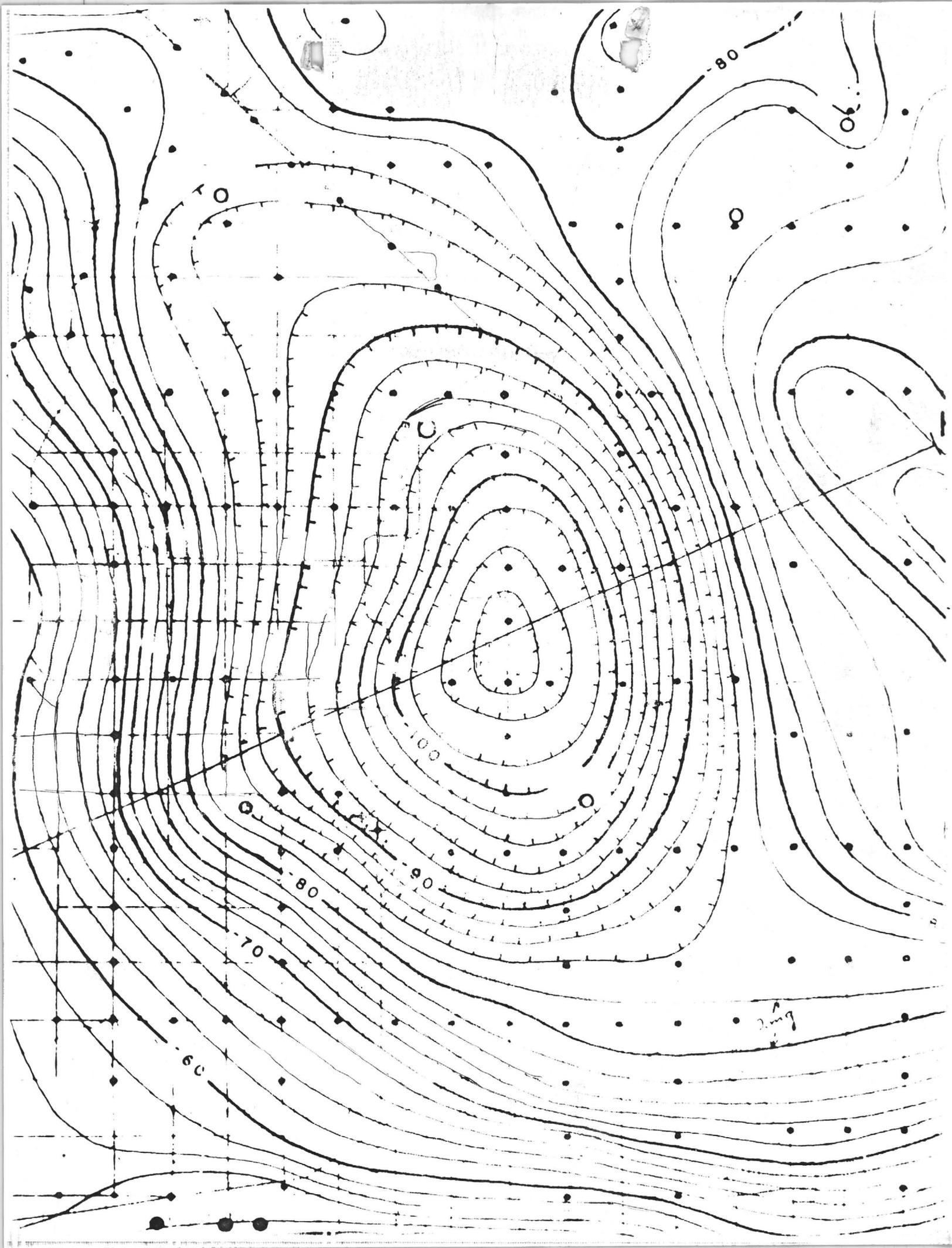


LOG OF COBBLEHAR FARM WEL 19-2

(B-2-1) 1962

0	6	Soil
6	30	Calichia
30	65	Packed sand
65	82	Clay & gravel
82	96	Boulders & sand
96	130	Sand Clay
130	170	Hard clay
170	180	Sand struck water
180	213	Sand Stone
213	230	Silt
230	248	Sand stone & gravel
248	254	Cemented gravel
254	258	Tight gravel
258	262	Loose sand & gravel
262	268	Loose sand & gravel some clay
268	295	Tight gravel
295	303	Loose gravel
303	308	Tight gravel
308	326	Loose gravel (water sample) 308-326
326	340	Loose silt sand & gravel
340	354	Tight silt
354	362	Loose gravel
362	374	Clay gravel & sand
374	394	Tight gravel
394	406	Clay some gravel
406	414	Loose gravel
414	490	Tight clay & gravel
490	504	Hard clay
504	545	Sand & gravel
545	555	Clay
555	580	Sand stone & small gravel & water
580	590	Clay
590	620	Clay & sand
620	630	Hard clay
630	815	Clay & some gravel
815	855	Clay silt & water
855	881	Dry silt
881	935	Joint clay & silt
935	970	Silt (water sample 920)
970	1178	Clay & silt dry with little streaks of sand (Water sample 1012)
1178	1192	Silt & sand stone
1192	1194	Clay & trace of sand
1194	1195	Hard sand stone
1195	1206	Clay & fine sand
1206	1246	Clay & silt
1246	1254	Soft clay & silt
1254	1260	Soft sand
1260	1296	Sticky
1296	1316	Clay
1316	1337	
1337	1340	

1058
412
646



February 12, 1968
1205 Orlando Drive
Coolidge, Arizona 85228

Mr. Grover Heinrichs
Heinrichs Geoexploration Company
P. O. Box 5671
Tucson, Arizona 85703

Dear Grover:

While this project is in an early stage, salt production from brine wells is a straight forward type of business and the location of this salt deposit in the center of a growing market allows larger than usual profits.

My prime objective in exploiting this salt development is to develop a regular income in a manner which will ultimately leave me a good bit of free time to continue as an independent prospector and developer.

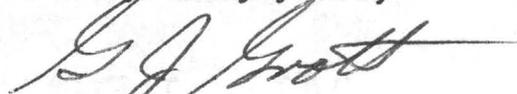
Attached is a short summary of the salt picture here together with a financing plan worked out in conjunction with Arizona Milling Company. They are the major salt customer in this marketing area and want the sales and distribution also. However, an impending merger caused much rethinking and an ultimate decision that the problems inherent in the merger would take their full attention for a few months and that they should not start a new project during the merger.

Arizona Milling Company understands the dangers in delay and has offered their assistance in my finding another partner without having attached any strings to their assistance, though they have suggested a way they can stay in the deal. I am going to accept their help. However, there is no basis on which to judge the possibilities of success and I do not wish to depend on that alone.

Perhaps one of your clients will find this of interest and we can work out a plan for financing the development.

Best regards.

Very truly yours,



Gerald J. Grott

GJG:emg

Enclosures

Organization and Financing

An Arizona Corporation will be formed with a nominal amount of capital stock. The balance of the capital will be obtained by loans by the stockholders other than myself. The loans must allow use of capital items as security for working capital loans.

Maturity of these notes or bonds will be as short as possible consistent with building the production capacity to about 100,000 tons per year before the notes are repaid.

Previous Plan

The plan worked out with Arizona Milling Company called for their receiving 81 percent of the capital stock. I, Gerald J. Grott, was to receive the balance of the stock and a consulting contract at \$2,000 per month as long as I cared to keep it. For the consulting contract, I was to provide all planning and managing supervision until the company was in profitable operation. Through this period service would be essentially full time but it was recognized that occasional absences of several days might be required.

After attaining profitable production, the duties would be reduced as fast as supervisory personnel were adequately trained to perform with only occasional checking on my part. This is the sort of operation I can direct very well on no more than a half-time basis.

Investment

Exploration Stage (three months)

Corporate Organization and Leasing including expenses to date	\$ 7,000
Expenses, three months	8,000
Contract Exploration	<u>35,000</u>
	\$ 50,000

Production⁽¹⁾

Brine well including high pressure pump	\$ 60,000
Pipelines, valves, surface pumps	20,000
Pond Preparation (leased land) 50 acres	10,000
Harvesting Equipment	10,000
Washer, Kiln, Grinder, Screens	20,000
Conveyors, Bagger, etc.	5,000
Metal Roof Building	5,000
Contingency - miscellaneous (10%)	<u>20,000</u>
	\$150,000

Construction and Start up Expenses - six months @ \$5,000/month	\$ 30,000
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(1) Individual items can vary widely depending on availability of used equipment and on the nature of the salt bed.

Production Costs

At this time information on the cost of the brine well is pretty much of a guess as the salt bed is not that well defined: it is necessary to estimate the well cost and brine cost on the high side. However, even allowing for high brine costs, a broad type engineering appraisal gives a cost for producing solar salt, Kiln Dried and Screened, at a little under \$5.00 per ton in bulk and placed in storage bins. There is a reasonable possibility of making this as low as \$4.00 per ton. The chance that the costs could go as high as \$6.00 per ton seems very remote.

These estimates include royalties on the lease(s) and amortization of exploration costs and capital investment in ten years, plus insurance, property taxes, etc.

Sales and Profits

The best Sales Policy is to maximize sales of the Kiln Dried Products. Profits are greatest because competitive products come in from San Francisco and the competitors are working on very slim margins. Minimum sales at the end of one year are expected at the rate of 80 - 90 percent of this market with a 5 - 10 percent price cut. Sales of Feed Salt are projected on a "lowest competitive price" level at half of this business by the end of the first year.

Projection: Minimum Rate at end of first year of production:

Water Softener	20,000 tons @ \$20.00/ton	\$400,000
Industrial	5,000 tons @ 15.50/ton	77,500
Stock Feed	<u>25,000 tons @ 12.50/ton</u>	<u>312,500</u>
	50,000 tons/year	\$790,000
less: freight	@ \$ 2.50 ⁽¹⁾	\$125,000
production	@ 5.00	250,000
warehousing & sales @ 12%		<u>100,000</u>
		<u>\$375,000</u>

Gross Profits before salaries and expenses

of Corporate Officers and before taxes \$315,000

The marketing area extends along the Southern Pacific east to El Paso for Kiln Dried salt and west to El Centro for all grades of salt. Sales three years from start of production, including Southern New Mexico as far as El Paso and Southern California to El Centro, and assuming a 10 percent cut in the price of feed salt, should reach about 75,000 tons/year. Gross Profits should reach \$450,000/year on the same basis as above.

(1) On Delivered to Phoenix basis - delivery to farther points is at higher prices.

Present Status

1) Arizona Milling Company wants sales and distribution and has proposed that I find a partner to finance the Exploration Stage: after this is done they will provide all further financing for half of the company stock. I am looking for such a partner with their help and also on my own.

2) This does not rule out someone taking over all of the deal essentially as Arizona Milling had it, except that Arizona Milling has assets that others might find more expensive to duplicate such as a statewide truck network and a sales and distribution setup already in operation.

3) It should be possible to work out a deal whereby I find a partner to finance production through the solar salt stage only. The solar salt would be sold to Arizona Milling Company, and perhaps others, who would take over the processing and sale thereafter. Such a straight production company offers just about maximum returns on investment with the least problems.

It would also leave the sale of industrial brine for chemical manufacturing all to my partner and myself.

Salt in Arizona

Market Survey data from two different customers, each of whom want to get into the business of salt distribution, check within a few thousand tons per year. There are no official records of salt brought into Arizona so these surveys, coupled with several spot checks, are used to estimate tonnage. Tonnage is for Central and Southern Arizona only.

Prices are for salt delivered in Phoenix, in carload or truck-load lots, at wholesale, to large users. Thus the prices given are the lowest under the present conditions.

Stock Feed	45,000-50,000 short tons/year	\$12.50-\$15.00/ton
Water Softener	22,000-25,000 short tons/year	\$21.20/ton*
Other Industrial	<u>5,000- 7,000 short tons/year</u>	\$16.70/ton
	72,000-82,000 short tons/year	

*Calculated as bagged salt less cost of bagging.

The Water Softener and Industrial Grades are kiln dried and now come from San Francisco. The feed salt is crude and comes from Carlsbad, New Mexico, from Old Mexico, and from the Danby Lake area in California.

The major advantage of the near Phoenix location is a freight saving of from \$2.00 per ton over Danby Lake, \$5.00 per ton over either New Mexico or Old Mexico, and about \$9.00 per ton over San Francisco. This advantage is estimated to be worth about \$250,000 - \$300,000 per year on the total market.

Southern Pacific feels there may be a chemical company which would like to locate at a source of low cost brine. This could be quite profitable but is still speculation.

February 12, 1968
1205 Orlando Drive
Coolidge, Arizona 85228

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Heinrichs Geoexploration Company
P. O. Box 5671
Tucson, Arizona 85703

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Gerald J. Grott
1205 Orlando Drive
Coolidge, Arizona 85228
Telephone: 723-3885

Married, 4 children
45 years old
6 feet, 195 pounds

Education: M.S., Metallurgy, 1951, M. I. T.
B.S., Business & Engineering Adm., 1949, M. I. T.

Experience

July 1964 to date. Consulting and development work including: an evaluation of manufacturing practices for cobalt-base weld rod, Crucible steel Company of America; plan for reorganizing and modernizing Superior Smelter, Magma Copper Company.

January 1962 - 1964. Arkota Steel Corporation, Coolidge, Arizona, General Manager. Pilot operation for producing sponge iron and ultra high purity pig iron. Responsible for all phases of planning, operations and sales.

January 1958 - December 1961. WaiMet Alloys Division (now Metals Division), Howmet Corporation, Dearborn, Michigan. Manufacturer of certified master alloy materials for jets, rockets, airframe and other critical applications, in form of shot and pig (ingot). Assistant General Manager and Operations Manager responsible for all company operations including labor negotiations, sales assistance, and customer consulting service and for duties of the General Manager (President) in his absence.

November 1956 - December 1957. Michigan Industries Division, Consolidated Foundry and Manufacturing Company, Detroit, Michigan. Assistant to Division President: Responsible for Technical Activities and assistance as production problem solver in the five companies in this division - a foundry, a machine shop, a fabricating shop for high alloys, a master alloy producer and a gray iron foundry. A major responsibility was Technical Director, Michigan-Standard Alloy Casting Company.

March 1955 - October 1956. Airloy, Inc., Ennis, Texas. Producer of precision steel castings for aircraft. Vice President, Manufacturing. Responsible for plant design and construction, equipment and installation, and work force recruitment and training.

April 1951 - February 1955. Unitcast Corporation, Toledo, Ohio. Producer of steel castings for the transportation and heavy equipment manufacturers. Superintendent of Standards (for Materials and Methods). Established standard manufacturing methods and specifications for purchased materials and gave technical assistance throughout the company.

September 1949 - February 1951. Steel Founders' Society - General Electric Company cooperative study "Metal Removal in the Cleaning of Steel Castings". As Research Associate, planned this program for industrial evaluation of "all known methods and all possible methods" (for metal removal), solicited manufacturers assistance, and directly supervised all activities, including the first known study of noise (sound intensity and frequency) produced by industrial tools.

Professional Societies

American Foundrymen's Society - 1948 to date.

Charter Chairman, M.I.T. Student Chapter, 1948-1949.

Treasurer, Toledo Chapter, 1951-1955.

Sand Division Technical Committee - 1952-1958.

National Officers Nominating Committee - 1954.

Publications of Technical Papers in Transactions A.F.S., 1954, 1955 and 1958.

American Society for Metals - 1949 to date.

Contributing Author, A.S.M. Correspondence Course in Steel Foundry Practice.

American Inst. of Min., Metall. and Pet. Engrs. - 1950 to date.

Electric Furnace Steel Conference Committee - 1959-1961.

Publications of Technical Papers, Transactions of E.F.S.C., A.I.M.E., 1960 and 1961.

American Society for Testing Materials, Specifications Committee A-10 (Steel), Sub-Committee VII, High Alloy Steels, 1957-1960.

Honorary Societies

Kappa Kappa Sigma - M.I.T. Honorary Society for Chemical Science.

Sigma Xi - National Honorary Society for Research in Science and Engineering.

Trade Societies

Steel Founders' Society of America

Gustav A. Lilliquist Award for Most Valuable Paper of Year in

"Steel Foundry Facts", Co-Recipient in 1953 and Recipient in 1956.

Alloy Casting Institute

Research Steering Committee, Corrosion Resistant Alloys, 1956-1958.

This Committee Authorized and evaluated society research at Battelle Memorial Institute, Columbus, Ohio.

Investment Casting Institute

Research Steering Committee, 1959-1961.

Chairman, Low Alloy Steel Specifications Committee, 1959-1961.

Other Publications

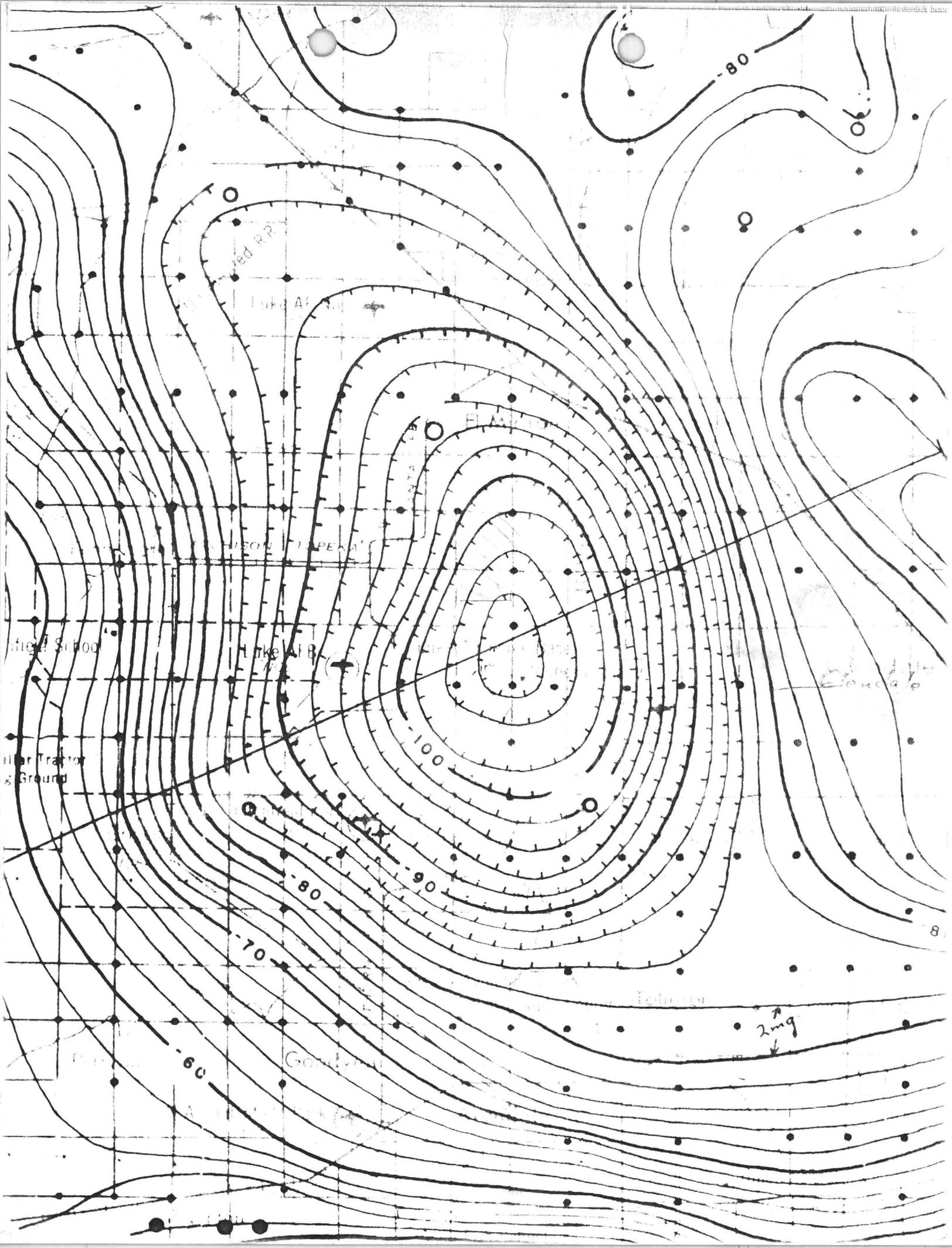
Ohio State Engineering Bulletin, 1951.

"Foundry" Magazine, 1954.

Patents

Application (1961) for new production process for hard facing and high alloy welding rod.

Applications currently in process for (a) converting autos and other miscellaneous scrap to useful products, (b) producing iron powder, (c) removing sulfurous gases from combustion gases, and (d) gasification of liquid and solid fuels. *recovery of elemental sulfur from metal sulfides*



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION (2-2-1) 2aca

WELL SCHEDULE

Date September 24, 1963 Field No. _____
 Record by Don Stalik Office No. _____
 Source of data Goodyear Farms

1. Location: State Arizona County Maricopa

Map _____
S1 1/4 NE 1/4 sec. 2 T 2 N R 1 W*

2. Owner: Goodyear Farms 2H Address Litchfield Park
 Tenant _____ Address _____
 Driller W.S. Williams Address _____

3. Topography _____

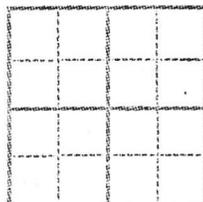
4. Elevation 1073 ft. above
 _____ ft. below

5. Type: Dug, drilled, driven, bored, jetted 19 53

6. Depth: Rept. 210 ft. Meas. _____ ft.

7. Casing: Diam. 20 in., to _____ in., Type _____

Depth 0 to 730 ft., Finish Part 252-730



8. Chief Aquifer _____ From _____ ft. to _____ ft.

Others _____

9. Water level 201.7 ft. ^{rept.} 12-30-1960 _{meas.} above
 _____ ft. below
 which is _____ ft. above surface
 _____ ft. below surface

10. Pump: Type Turbine Capacity _____ G. M.

Power: Kind Electric Horsepower _____

11. Yield: Flow _____ G. M., Pump _____ G. M., Meas., Rept. Est.

Drawdown _____ ft. after _____ hours pumping _____ G. M.

12. Use: Dom., Stock, PS., RR., Ind., Irr., Obs. _____

Adequacy, permanence _____

13. Quality _____ Temp 87 °F.

Taste, odor, color _____ Sample Yes _____ No _____

Unfit for _____

14. Remarks: (Log, Analyses, etc.) Plugged with cement from

0 to 730 because of salt.

See level 830 8-21-74

Drillers Log

(8-2-1) 2aca

0-4	Soil
4-15	Hard pan
15-22	Clay & silt
22-48	Cemented gravel
48-82	Clay & gravel
82-106	Gravel & boulders
106-124	Clay, sand & gravel
124-162	Clay & silt
162-186	Sand & clay
186-216	Clay
216-226	Silt
226-248	Silt & gravel
248-274	Gravel
274-278	Gravel & clay
278-287	Cemented silt & gravel
287-298	Silt lime sand & gravel
298-315	Clay & jyp rock
315-339	Sand & gravel
339-420	Clay & some gravel
420-428	Hard dry clay
428-484	White mountain formation
484-558	Cemented clay dry
558-598	White chalk
598-698	Green & white clay
698-703	Red lava gravel & hot water
703-724	Lava ledge
724-740	Red clay & lava rock
740-791	Clay & silt
791-827	Clay, soft
827-832	Gravel & salt
832-840	Rock salt

clay @ caliche bindings

black malapa bedrock?

1070
740
330

234	235	Tight gravel
237	262	Loose sand & gravel
242	268	Loose sand & gravel some clay
268	295	Tight gravel
285	304	Loose gravel
306	308	Tight gravel
308	326	Loose gravel (water sample) 308-326
326	340	Loose silt sand & gravel
340	354	Tight silt
354	362	Loose gravel
362	374	Clay gravel & sand
374	394	Tight gravel
394	406	Clay some gravel
406	414	Loose gravel
414	490	Tight clay & gravel
490	504	Hard clay
504	545	Sand & gravel
545	555	Clay
555	580	Sand stone & small gravel & water
580	590	Clay
590	620	Clay & sand
620	630	Hard clay
630	815	Clay & some gravel
815	855	Clay silt & water
855	881	Dry silt
881	935	Joint clay & silt
935	970	Silt (water sample 920)
970	1178	Clay & silt dry with little streaks of sand (Water sample 1012)
1178	1192	Silt & sand stone
1192	1194	Clay & trace of sand
1194	1195	Hard sand stone
1195	1206	Clay & fine sand
1206	1246	Clay & silt
1246	1254	Soft clay & silt
1254	1260	Soft sand stone
1260	1276	Sticky clay & silt — <i>plugged @ 12</i>
1296	1318	Clay
1318	1337	Clay & silt
1337	1340	Sand & silt, very fine-hot water-don't cut in.
1340	1360	Clay & silt (water sample 1270)
1360	1490	Clay very sticky some silt (Water sample 1418)
1490	1516	Silt with a clay binder
1516	1520	Fine grain rock-ledge-very hard
1520	1528	Silt
1528	1570	Silt & sand (water was cold)
1570	1586	Fine sand with <u>salt water</u> don't cut in.
1586	1597	Clay & Silt
*1597	1601	Mountain rock & sand-water hot (water sample 1596)
1601	1605	Clay silt & sand
1605	1615	Fine sand stone & clay
1615	1630	Clay & silt (water level 600'ft.)
1630	1660	Sand stone inlaid in silt, no water
1660	1689	A white mountain gravel in clay & silt
*1689	1700	White spar rock in boulder form
1700	1720	White rock in <i>anhydrite?</i> (very hot water)

1720	1729	White rock in sand-water level at 169 ft. (water sample 1729)
1729	1740	Clay & silt more clay
1740	1743	Clay
1743	1747	Hard clay
1747	1810	Clay & silt (water level 158 ft. very hot)
1810	1837	Silt sand stone-with a white line-water 158 ft.
1837	1840	Hard sand stone-water level 350 ft.
1840	1868	Clay dry
1868	1871	Fine sand & silt-water level 149 ft. (water sample 1868)
1871	1893	Hard silt stone & clay
1893	1910	Sand some gravel & clay-water good
1910	1928	Clay & silt
1928	1936	Fine sand (water sample at 1936)
1936	1968	Hard clay (water sample at 1968)
1968	2004	Soft clay & silt with hot water
2004	2040	Sand & gravel water level 147 ft.
2040	2048	Granite boulders imbedded in hard cemented sand (water sampled 2054)
2048	2054	Granite gravel-loose (water level at 147. temp. <u>124°</u>)
2054	2070	Granite gravel-tight-water level 172
2070	2073	Hard granite ledge
2073	2084	Fine sand & granite gravel-level 147 ft. <u>hot salt water temp. 114°</u>
2084	2106	Granite sand & gravel-filled up pipe 6 ft. (water sample 2098)
2106	2133	Coarse sand-water level 152 ft. temp. <u>112°</u>
2133	2142	Granite ledge very hard
2142	2155	Sand, clay & silt-water sample 2155 to 2190
2155	2218	Sand stone some clay or silt & granite imbedded
2218	2230	Red sticky clay
2230	2235	Sand, gravel & clay-water level 210 ft.
2235	2255	Hard clay, gravel & silt temp. <u>124°</u>
2255	2280	Hard clay silt & sand stone water level 160
2280	2311	Soft brown sand stone
2311	2318	Granite boulders imbedded in clay-water level 300 ft. Temp. <u>129°</u>
2318	2386	Rock salt ledge (don't cut) Water level <u>168'</u>
2386	2398	Brown sand & salt
2398	2550	Salt ledge
2550	2556	Granite ledge (Water sample 2350)
2556	2632	Salt
2632	2636	Sand
2636	2643	Salt
2643	2652	Mountain gravel & sand
2652	2656	Blue rock-
2656	2743	Salt
2743	2745	Very hard rock imbedded in salt
2745	2774	Salt
2774	2781	Large granite boulders imbedded in sand stone.
2781	2784	Salt

LV

425

466

1950 ft

2743
2318
425

395' (avg 900)
466' (avg 900)
421' (avg 900)
Salt formation

2000
1088
-946

11565 Site on Tuesday } 196aa

Lat # 207

sampled to 225' by S Schwante & R. Beer

Lab # 1729 elev. 1075 - at 1452' ~~Color~~

(B-2-1) 21abb Low color
1452' off white

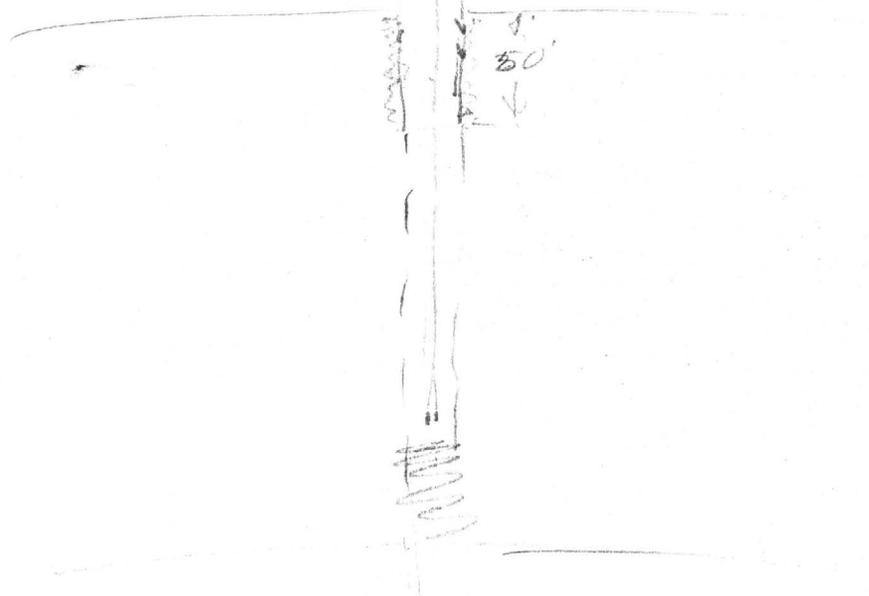
Remains
Salt Flakes

(B-2-1) 21ccb
Lat # 1858

at 1570-1580 Fine to med sand & gypsum flakes
on to 1905' no salt.

(B-2-1) 31bba
Lat # 2142 at 2100' mostly fine sand & gypsum

R.



LOG OF GOODYEAR FARMS WELL 19-3

(B-2-1) 196a

0	6	Soil
6	30	Calichia
30	65	Packed sand
65	82	Clay & gravel
82	96	Boulders & sand
96	130	Sand Clay
130	170	Hard clay
170	180	Sand struck water
180	213	Sand Stone
213	230	Silt
230	248	Sand stone & gravel
248	254	Cemented gravel
254	258	Tight gravel
258	262	Loose sand & gravel
262	268	Loose sand & gravel some clay
268	295	Tight gravel
295	303	Loose gravel
303	303	Tight gravel
303	326	Loose gravel (water sample) 303-326
326	340	Loose silt sand & gravel
340	354	Tight silt
354	362	Loose gravel
362	374	Clay gravel & sand
374	394	Tight gravel
394	406	Clay some gravel
406	414	Loose gravel
414	490	Tight clay & gravel
490	504	Hard clay
504	545	Sand & gravel
545	555	Clay
555	580	Sand stone & small gravel & water
580	590	Clay
590	620	Clay & sand
620	630	Hard clay
630	815	Clay & some gravel
815	855	Clay silt & water
855	881	Dry silt
881	935	Joint clay & silt
935	970	Silt (water sample 920)
970	1178	Clay & silt dry with little streaks of sand (Water sample 1012)
1178	1192	Silt & sand stone
1192	1194	Clay & trace of sand
1194	1195	Hard sand stone
1195	1206	Clay & fine sand
1206	1246	Clay & silt
1246	1254	Soft clay & silt
1254	1260	Soft sand
1260	1296	Sticky
1296	1318	Clay
1318	1337	
1337	1340	

1058
414
644

1058
414
644

up

mv

Gerald J. Grott
1205 Orlando Drive
Coolidge, Arizona 85228
Telephone: 723-3885

Married, 4 children
45 years old
6 feet, 195 pounds

Education: M.S., Metallurgy, 1951, M. I. T.
B.S., Business & Engineering Adm., 1949, M. I. T.

Experience

July 1964 to date. Consulting and development work including: an evaluation of manufacturing practices for cobalt-base weld rod, Crucible steel Company of America; plan for reorganizing and modernizing Superior Smelter, Magma Copper Company.

January 1962 - 1964. Arkota Steel Corporation, Coolidge, Arizona, General Manager. Pilot operation for producing sponge iron and ultra high purity pig iron. Responsible for all phases of planning, operations and sales.

January 1958 - December 1961. WaiMet Alloys Division (now Metals Division), Howmet Corporation, Dearborn, Michigan. Manufacturer of certified master alloy materials for jets, rockets, airframe and other critical applications, in form of shot and pig (ingot). Assistant General Manager and Operations Manager responsible for all company operations including labor negotiations, sales assistance, and customer consulting service and for duties of the General Manager (President) in his absence.

November 1956 - December 1957. Michigan Industries Division, Consolidated Foundry and Manufacturing Company, Detroit, Michigan. Assistant to Division President: Responsible for Technical Activities and assistance as production problem solver in the five companies in this division - a foundry, a machine shop, a fabricating shop for high alloys, a master alloy producer and a gray iron foundry. A major responsibility was Technical Director, Michigan-Standard Alloy Casting Company.

March 1955 - October 1956. Airloy, Inc., Ennis, Texas. Producer of precision steel castings for aircraft. Vice President, Manufacturing. Responsible for plant design and construction, equipment and installation, and work force recruitment and training.

April 1951 - February 1955. Unitcast Corporation, Toledo, Ohio. Producer of steel castings for the transportation and heavy equipment manufacturers. Superintendent of Standards (for Materials and Methods). Established standard manufacturing methods and specifications for purchased materials and gave technical assistance throughout the company.

September 1949 - February 1951. Steel Founders' Society - General Electric Company cooperative study "Metal Removal in the Cleaning of Steel Castings". As Research Associate, planned this program for industrial evaluation of "all known methods and all possible methods" (for metal removal), solicited manufacturers assistance, and directly supervised all activities, including the first known study of noise (sound intensity and frequency) produced by industrial tools.

Professional Societies

American Foundrymen's Society - 1948 to date.

Charter Chairman, M.I.T. Student Chapter, 1948-1949.

Treasurer, Toledo Chapter, 1951-1955.

Sand Division Technical Committee - 1952-1958.

National Officers Nominating Committee - 1954.

Publications of Technical Papers in Transactions A.F.S., 1954, 1955 and 1958.

American Society for Metals - 1949 to date.

Contributing Author, A.S.M. Correspondence Course in Steel Foundry Practice.

American Inst. of Min., Metall. and Pet. Engrs. - 1950 to date.

Electric Furnace Steel Conference Committee - 1959-1961.

Publications of Technical Papers, Transactions of E.F.S.C., A.I.M.E., 1960 and 1961.

American Society for Testing Materials, Specifications Committee

A-10 (Steel), Sub-Committee VII, High Alloy Steels, 1957-1960.

Honorary Societies

Kappa Kappa Sigma - M.I.T. Honorary Society for Chemical Science.

Sigma Xi - National Honorary Society for Research in Science and Engineering.

Trade Societies

Steel Founders' Society of America

Gustav A. Lilliquist Award for Most Valuable Paper of Year in

"Steel Foundry Facts", Co-Recipient in 1953 and Recipient in 1956.

Alloy Casting Institute

Research Steering Committee, Corrosion Resistant Alloys, 1956-1958.

This Committee Authorized and evaluated society research at Battelle Memorial Institute, Columbus, Ohio.

Investment Casting Institute

Research Steering Committee, 1959-1961.

Chairman, Low Alloy Steel Specifications Committee, 1959-1961.

Other Publications

Ohio State Engineering Bulletin, 1951.

"Foundry" Magazine, 1954.

Patents

Application (1961) for new production process for hard facing and high alloy welding rod.

Applications currently in process for (a) converting autos and other miscellaneous scrap to useful products, (b) producing iron powder, (c) removing sulfurous gases from combustion gases, and (d) gasification of liquid and solid fuels. *recovery of elemental sulfur from mineral sulfides*

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION (2-2-1) 2aca

WELL SCHEDULE

Date September 28, 1963 Field No. _____
 Record by Tom Stalik Office No. _____
 Source of data Goodyear Farms

1. Location: State Arizona County Maricopa
 Map _____

S4 1/4 13 1/4 sec. 2 T 2 N 1 R 1 W 1

2. Owner: Goodyear Farms 211 Address Litchfield Park
 Tenant _____ Address _____
 Driller W.S. Williams Address _____

3. Topography _____

4. Elevation 1073 ft. above
 _____ below

5. Type: Dug, drilled, driven, bored, jetted 8-19-53

6. Depth: Rept. 310 ft. Meas. _____ ft.

7. Casing: Diam. 20 in., to _____ in., Type _____
 Depth 310 ft., Finish Part 262-730

8. Chief Aquifer _____ From _____ ft. to _____ ft.
 Others _____

9. Water level 221.47 ft. meas. 12-30-1960 above
 _____ below surface
 which is _____ ft. below surface

10. Pump: Type Turbine Capacity _____ G. M.
 Power: Kind Electric Horsepower _____

11. Yield: Flow _____ G. M., Pump _____ G. M., Meas., Rept. Est.
 Drawdown _____ ft. after _____ hours pumping _____ G. M.

12. Use: Dom., Stock, PS., RR., Ind., Irr., Obs. _____
 Adequacy, permanence _____

13. Quality _____ Temp 87 °F.
 Taste, odor, color _____ Sample Yes _____ No _____
 Unfit for _____

14. Remarks: (Log, Analyses, etc.) Plugged with cement from
262-730 because of salt
See Card 930 8-21-59

Drillers Log

(3-2-1) 2aca

0-4	Soil
4-15	Hard pan
15-22	Clay & silt
22-48	Cemented gravel
48-82	Clay & gravel
82-106	Gravel & boulders
106-124	Clay, sand & gravel
124-162	Clay & silt
162-186	Sand & clay
186-216	Clay
216-226	Silt
226-240	Silt & gravel
240-274	Gravel
274-278	Gravel & clay
278-287	Cemented silt & gravel
287-298	Silt lime sand & gravel
298-315	Clay & jsp rock
315-339	Sand & gravel
339-420	Clay & some gravel
420-428	Hard dry clay
428-484	White mountain formation
484-550	Cemented clay dry
550-578	White chalk
578-698	Green & white clay
698-703	Red lava gravel & hot water
703-724	Lava ledge
724-740	Red clay & lava rock
740-791	Clay & silt
791-827	Clay, soft
827-832	Gravel & salt
832-840	Rock salt

-clay @ caliche binding

black malaya

10 1/2
7 1/2
2 3/4

LOG OF GOODYEAR FARMS WELL 19-E

(B-2-1) 1960

0	6	Soil
6	30	Calichia
30	65	Packed sand
65	82	Clay & gravel
82	96	Boulders & sand
96	130	Sand Clay
130	170	Hard clay
170	180	Sand struck water
180	213	Sand Stone
213	230	Silt
230	248	Sand stone & gravel
248	254	Cemented gravel
254	258	Tight gravel
258	262	Loose sand & gravel
262	268	Loose sand & gravel some clay
268	295	Tight gravel
295	303	Loose gravel
303	308	Tight gravel
308	326	Loose gravel (water sample) 303-326
326	340	Loose silt sand & gravel
340	354	Tight silt
354	362	Loose gravel
362	374	Clay gravel & sand
374	394	Tight gravel
394	406	Clay some gravel
406	414	Loose gravel
414	490	Tight clay & gravel
490	504	Hard clay
504	545	Sand & gravel
545	555	Clay
555	580	Sand stone & small gravel & water
580	590	Clay
590	620	Clay & sand
620	630	Hard clay
630	815	Clay & some gravel
815	855	Clay silt & water
855	881	Dry silt
881	935	Joint clay & silt
935	970	Silt (water sample 920)
970	1178	Clay & silt dry with little streaks of sand (Water sample 1012)
1178	1192	Silt & sand stone
1192	1194	Clay & trace of sand
1194	1195	Hard sand stone
1195	1206	Clay & fine sand
1206	1246	Clay & silt
1246	1254	Soft clay & silt
1254	1260	Soft sand
1260	1296	Sticky
1296	1318	Clay
1318	1337	
1337	1340	

1058
414
644

224	235	Tight gravel
238	242	Loose sand & gravel
252	268	Loose sand & gravel some clay
268	295	Tight gravel
295	306	Loose gravel
306	308	Tight gravel
308	326	Loose gravel (water sample) 308-326
326	340	Loose silt sand & gravel
340	354	Tight silt
354	362	Loose gravel
362	374	Clay gravel & sand
374	394	Tight gravel
394	406	Clay some gravel
406	414	Loose gravel
414	490	Tight clay & gravel
490	504	Hard clay
504	545	Sand & gravel
545	555	Clay
555	580	Sand stone & small gravel & water
580	590	Clay
590	620	Clay & sand
620	630	Hard clay
630	815	Clay & some gravel
815	855	Clay silt & water
855	881	Dry silt
881	935	Joint clay & silt
935	970	Silt (water sample 920)
970	1178	Clay & silt dry with little streaks of sand (Water sample 1012)
1178	1192	Silt & sand stone
1192	1194	Clay & trace of sand
1194	1195	Hard sand stone
1195	1206	Clay & fine sand
1206	1246	Clay & silt
1246	1254	Soft clay & silt
1254	1260	Soft sand stone
1260	1276	Sticky clay & silt — <i>plugged @ 12</i>
1296	1318	Clay
1318	1337	Clay & silt
1337	1340	Sand & silt, very fine-hot water-don't cut in.
1340	1360	Clay & silt (water sample 1350)
1360	1490	Clay very sticky some silt (Water sample 1418)
1490	1516	Silt with a clay binder
1516	1520	Fine grain rock-ledge-very hard
1520	1528	Silt
1528	1570	Silt & sand (water was cold)
1570	1586	Fine sand with <u>salt water don't cut in.</u>
1586	1597	Clay & Silt
*1597	1601	Mountain rock & sand-water hot (water sample 1596)
1601	1605	Clay silt & sand
1605	1615	Fine sand stone & clay
1615	1630	Clay & silt (water level 600'ft.)
1630	1660	Sand stone inlaid in silt, no water
1660	1689	A white mountain gravel in clay & silt
*1689	1700	White spar rock in boulder form
1700	1720	White rock in clay-spar rock 149 ft. (<i>anhydrite?</i> <u>very hot water</u>)

1720	1729	White rock in sand-water level at 169 ft. (water sample 1729)
1729	1740	Clay & silt more clay
1740	1743	Clay
1743	1747	Hard clay
1747	1810	Clay & silt (water level 158 ft. very hot)
1810	1837	Silt sand stone-with a white liase-water 158 ft.
1837	1840	Hard sand stone-water level 350 ft.
1840	1863	Clay dry
1863	1871	Fine sand & silt-water level 149 ft. (water sample 1863)
1871	1893	Hard silt stone & clay
1893	1910	Sand some gravel & clay-water good
1910	1928	Clay & silt
1928	1936	Fine sand (water sample at 1936)
1936	1958	Hard clay (water sample at 1958)
1958	2004	Soft clay & silt with hot water
2004	2040	Sand & gravel water level 147 ft.
2040	2048	Granite boulders imbeded in hard cemented sand (water sampled 2054)
2048	2054	Granite gravel-loose (water level at 147. temp. <u>124°</u>)
2054	2070	Granite gravel-tight-water level 172
2070	2073	Hard granite ledge
2073	2084	Fine sand & granite gravel-level 147 ft. <u>hot salt water temp. 114°</u>
2084	2106	Granite sand & gravel-filled up pipe 6 ft. (water sample 2098)
2106	2133	Coarse sand-water level 152 ft. temp. <u>112°</u>
2133	2142	Granite ledge very hard
2142	2155	Sand, clay & silt-water sample 2155 to 2190
2155	2218	Sand stone some clay or silt & granite imbeded
2218	2230	Red sticky clay
2230	2235	Sand, gravel & clay-water level 210 ft.
2235	2255	Hard clay, gravel & silt temp. <u>124°</u>
2255	2280	Hard clay silt & sand stone water level 180
2280	2311	Soft brown sand stone
2311	2318	Granite boulders imbeded in clay-water level 300 ft. Temp. <u>129°</u>
2318	2386	Rock salt ledge (don't cut) Water level <u>168'</u>
2386	2393	Brown sand & salt
2393	2550	Salt ledge
2550	2556	Granite ledge (Water sample 2350)
2556	2632	Salt
2632	2636	Sand
2636	2643	Salt
2643	2652	Mountain gravel & sand
2652	2656	Blue rock-
2656	2743	Salt
2743	2745	Very hard rock imbeded in salt
2745	2774	Salt
2774	2781	Large granite boulders imbeded in sand stone.
2781	2784	Salt

LV

425

466

13000
14500 psi

2743
2318
425

2000
1058
-946

395' (congruent)
425' (congruent)
466' (congruent)
500' (congruent)
535' (congruent)
570' (congruent)
605' (congruent)
640' (congruent)
675' (congruent)
710' (congruent)
745' (congruent)
780' (congruent)
815' (congruent)
850' (congruent)
885' (congruent)
920' (congruent)
955' (congruent)
990' (congruent)
1025' (congruent)
1060' (congruent)
1095' (congruent)
1130' (congruent)
1165' (congruent)
1200' (congruent)
1235' (congruent)
1270' (congruent)
1305' (congruent)
1340' (congruent)
1375' (congruent)
1410' (congruent)
1445' (congruent)
1480' (congruent)
1515' (congruent)
1550' (congruent)
1585' (congruent)
1620' (congruent)
1655' (congruent)
1690' (congruent)
1725' (congruent)
1760' (congruent)
1795' (congruent)
1830' (congruent)
1865' (congruent)
1900' (congruent)
1935' (congruent)
1970' (congruent)
2005' (congruent)
2040' (congruent)
2075' (congruent)
2110' (congruent)
2145' (congruent)
2180' (congruent)
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USGS Site in Tucson } 196aa

Lat # 207

Sampler checked to 2240' by S Schminke & RE Beer

Lab # 1729 also 1075 - at 1452' ~~off~~ color

(B-2-1) 21abb Raw color

1452' Off white

Remarks:
Silt & Shales

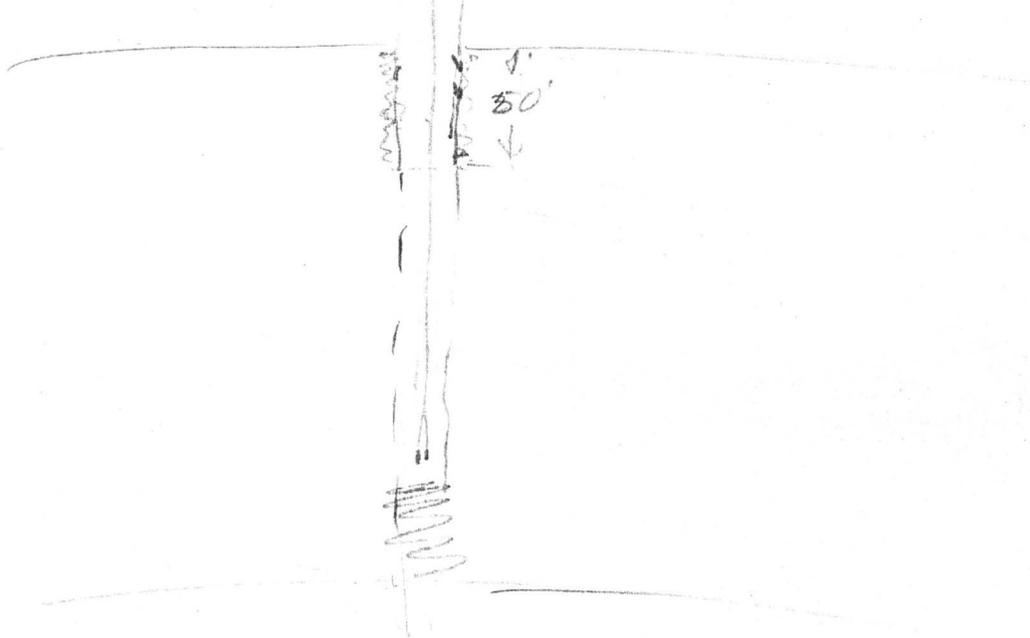
(B-2-1) 21ccb

Lat # 1858

at 1570-1580 Fine to med Sand & gypsum Flakes
on to 1905' no salt.

(B-2-1) 31bba

Lat # 2142 to 2100' mostly fine sand & pebbles @



Jerry Galt

sent this

over

5/3/68

1/2

LUKE AIR FORCE BASE

B-2-1/196aa

REAMS ROAD

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R.I.W

WEST CHINA TRACK

WEST Irrigation Ditch

Wire Fence - Wood Posts

Wire Fence - Metal Posts

Power Line

4" = 1 mile

21

B. G. Smith
5/2/68

LITCHFIELD ROAD

T2N

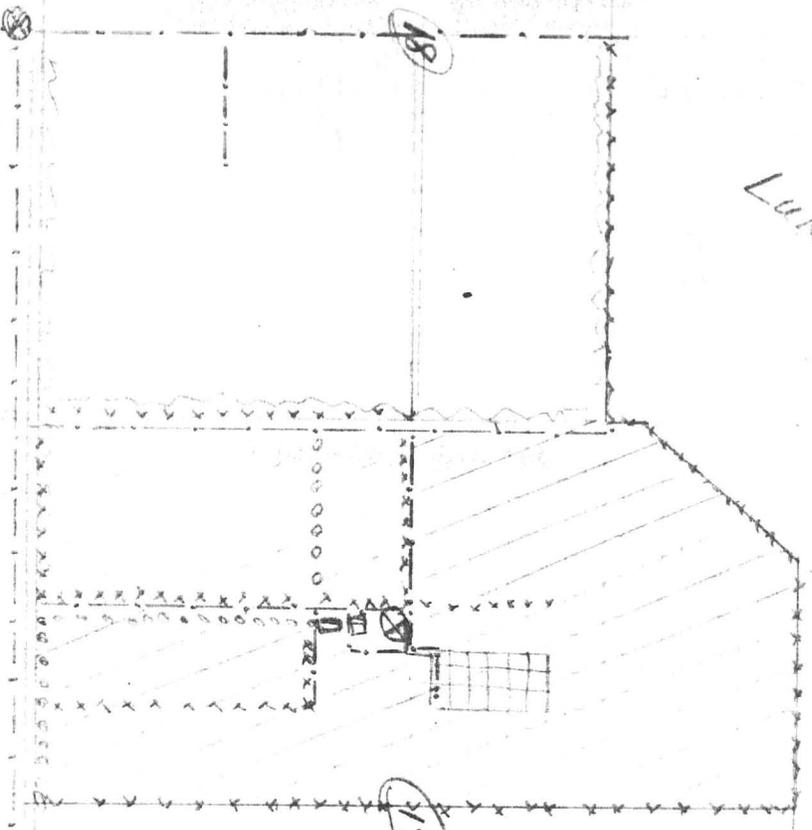
Luke Air Force Base

15

B-2-1 1962a

18

REAMS ROAD



20

R.I.W

17

21

B & F
3/2/68

16

West Irrigation Ditch
 o o o o o Wire Fence - Wood Posts
 x x x x x Wire Fence - Metal Posts
 - - - - - Power Line

WEST IRRIGATION DITCH

LITCHFIELD ROAD

T21

January 16, 1969

Mr. Jerry Grott
1205 Orlando Dr.
Coolidge, Arizona 85228

Re: Proposed Resistivity & Gravity
Surveys, Maricopa County, Ariz.

Dear Jerry:

This will confirm the conversation of January 4, 1968 with you and for our mutual understanding and agreement we propose the following :

1. A resistivity depth probe survey in the vicinity of Well B-19 located in Sec. 19, T2N, R1W, Maricopa County, Arizona. The purpose of the survey is to gain resistivity information to a depth of 2,600 feet if possible and possible resistivity correlation with salt (sodium chloride?) zones reportedly encountered in the drill hole.

If a resistivity correlation is found to exist an extension program may be recommended for future development of the adjacent areas.

2. To confirm and define a gravity low known to exist in the vicinity of Sec. 1 & 2, T 2 N, R 1 W and Sec. 35, 36, T 3 N, R 1 W. Maricopa County, Arizona by conducting a gravity survey on a closer line and station spacing than has been done to date.

3. Conduct a resistivity survey over the located gravity low to determine the possible existence of and depth of suspected salt zones.

Charges for the above will be at the following rate:

Report compilation and interpretation \$150.00/staff day.
A resistivity Survey Crew, \$250.00 / 3 man crew.
\$350.00/ 5 man crew

A gravity survey crew \$200.00/day, 2 men
\$250.00/day, 3 men.

Mr. Jerry Grott

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January 16, 1968

Expenses charged will include vehicles at \$12.00/day plus \$0.12 per mile. Directly related supplies, communications living and other directly incidental charges, at cost.

Mobilization and demobilization, travel, excessive weather delay and standby charges are one half the daily rate. Break-down of our equipment in excess of one hour per day will be made up or not charged.

Total estimate for the job as proposed above will be approximately \$4,500.00 and take about three to four weeks to complete the field work and write a report.

Others of our technical staff are involved as needed and/or are supplied as requested and mutually agreed upon.

All property permits, brushing and trespassing-liability and related costs incurred on behalf of client assumed by client. Charges for extra equipment and personnel employed if mutually desired, are extra.

GEOEX will save harmless from all Workmen's Compensation, public liability and property damage liability incurred by GEOEX employees.

Preliminary reports or copies of rough field plotting sheets will be available as work progresses.

Payments due on presentation. Billings may be submitted periodically with final statement after completion of final report.

In order to schedule a crew, since we have had no previous business relationship, an advance on account in the amount of \$2,500.00 will be required.

Indication of your understanding and approval of the above by executing as provided below on the attached copy of this letter and returning it to us, will be most appreciated.

Sincerely yours,
HEINRICHS GEOEXPLORATION CO.

EGH:jh

E. Grover Heinrichs
Vice President

Date: _____

Accepted by: _____

Title: _____

cc: Extra Encl.