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# SPEED MEMO

To *Paul Eimon* At *Jucron*

Subject *Alkylation Acid Tests. Dr. Bhappu* Date *9/5/72*

*Bhappu reports that he had an interesting and productive talk with Geo. Roseware on an academic level. Roseware gave Bhappu some data on his testing of the alkylation acid in question. He also gave Bhappu a sample of the acid. Tests can be made at your convenience.*

**PLEASE REPLY TO**



Signed

*Clyde Osborn*

At

Date

Signed

SENDER'S COPY

8/24 8/28/11

51 YES.

SOME OF THE PARTICULATES SUCH AS CARBON AND TAIL ARE DEPOSITED, OR FILTERED OUT, IN THE <sup>IMPLICITIES</sup> SLURRY, OTHERS REPORT OUT IN THE LEACHING SOLUTION.

52 (2) THE EXACT NATURE OF THE HYDROCARBONS IN ALKYLATION OF THE HYDROLYZABLE ACIDS IS NOT KNOWN, BUT MANY ARE SOLUBLE IN ACID AND WATER. SULFATE ESTERS AND VARIOUS SULFONIC ACIDS, (AEROSOL) (SULFATE ESTER  $O_2SO_3H$ ) (SURFACE-ACTIVE AGENTS). WHICH OF THESE INHIBITS LEACHING OF COPPER IS NOT KNOWN, BUT IT IS COMMONLY KNOWN THAT CERTAIN OXIDE ORES DO NOT RESPOND AS WELL TO ALKYLATION ACID-LEACHING AS THEY DO TO VIRGIN ACID-LEACHING.

(a) PROBABLY THE SULFATE ESTERS AND SULFONIC ACIDS

(c) ESSEX HAS NOT MADE ANY TESTS. DONT KNOW

(d) DONT KNOW.

IT IS COMMONLY KNOWN AMONG HYDRO-METALLURGISTS THAT CERTAIN OXIDE COPPER ORES DO NOT RESPOND TO LEACHING BY ALKYLATION ACIDS TO THE SAME DEGREE THAT THEY RESPOND TO LEACHING BY VIRGIN ACID.

53. THE POSSIBLE PRESENCE OF AEROSOL MIGHT BE BENEFICIAL.

THE AEROSOL ACTING AS A WETTING AGENT COULD BRING THE ACID INTO SURFACE CONTACT MORE EFFECTIVELY THAN SOLUTIONS NOT CONTAINING AEROSOL.

54. YES.

55. (a) COMMERCIAL ACID KNOWN AS Virgin Acid

(The only evidence I have is the test work that Clem Chene did. He gave me this data 2 years ago).

(b) Names and addresses. --?

(c) No specific tests were made by Esser (if Clem's reports can be submitted the answer would be - 15%)

(Nothing has been published that I can find in a brief library search).

(Bhopper is searching also - he is going to talk to Rosemary).

(d) Did Tony Krohn have any info.

Inspiration  $19^{\circ}$ /<sub>700</sub>

(e) # 2850 (El Paso - Emerald Dale operation - where did they get acid?). (Ted Runkel).

(f) Rail or truck (highway).

(g) The same as for alkylated acid and virgin acid

(h) No.

56 Don't know what the effect would be.

57. It would not have any appreciable effect on the <sup>quantity of</sup> make-up water.

58 No tests have been made by Essex

59 No tests have been made by Essex

60 (a) " " " " " " " "

(b) " " " " " " " "

(c) " " " " " " " "

(d) " " " " " " " "

(e) " " " " " " " "

61 ~~If this question refers to recovery of copper  
minerals the answer is yes.~~  
see next page

Examine for Leo.

see next page for 62

63 No tests have been run <sup>by Essex</sup> on Pmc ores  
with either virgin acid or alkylation acid,  
however, Essex has run tests on several  
other ores using virgin acid.

64 No tests have been made by Essex on  
Pmc ores.

65. No.

→ 66. An acid containing carbon and hydrocarbons,  
such as sulphate esters, and sulphonic acids.

67. Yes.

actually there is no such thing  
as a reducing acid

61. If this question refers to copper minerals Essel contends that recovery of copper is lowered by the impurities but not rendered completely unrecoverable.

62. (a) The recovery of ~~all of the~~ copper from all of the minerals is adversely affected by the impurities, especially Chalcocite and cuprite.

(b) Essel has not made any tests on the ore.

(c) Clyde Osborn

Dr. Phipps, et al?

(d) No tests or analysis have been made

(1) (1) No tests made

(2) " " "

(3) " " "

(4) " " "

(5) " " "

(6) " " "

---

65. (b) The typical analysis of spent acetylation acid, which we contend is a "reducing acid" is as follows:

85% - 90%  $H_2SO_4$

1% - 3% Carbon / HYPOCARBON

3% - 7% Ash

Balance is water

(a) Not known.

(c) Not known.

(d) Essel doesn't understand what is meant by

(c) - what is meant by "recovery rate"?

If "recovery of copper" is meant in solids and  
(a) Essel contends that the final recovery of copper would be lower.

"Recovery rate" would be more of a function of other features of the operation but the impure acid, <sup>would</sup> contribute to a slower "recovery rate".

69. As much as 15%.

70. The leaching solution is generally an dilute acid, made by adding acid to water or to plant solutions. The soluble impurities (hydrocarbons) in the acid will also be found in the leaching solutions. The chemical composition is not known.

71. No.

72. No.

73. Yes. Especially carbonates, such as limestone.

74. ?

FOR LEO SMITH

8/30/72

Reference Books:

1. SULFURIC ACID

Copyright 1965. MCGRAW HILL, INC

AUTHOR OSCAR T. FASULLO

CONSOLIDATED CHEMICAL DIVISION

STAUFFER CHEMICAL COMPANY

HOUSTON TEXAS

2. MANUFACTURE OF SULFURIC ACID

REINHOLD PUBLISHING COMPANY

DEPT. B 335

430 PARKER AVE

NEW YORK NY

AUTHORS WERNER W DUECKER

JAMES R. WEST

66° Baumé Acid is 93.17% H<sub>2</sub>SO<sub>4</sub>

CEO

~~Ed Frohling - Safford~~

Mountain States

Interviewed Creider

~~Cre~~

Nothing wrong with acid.

Tar should have been removed.

They were trying to clean it up but failed.

Cobre mines owes C.P.C.

~~Motion September 5~~

~~Fernandez - new judge~~

DATE \_\_\_\_\_  
FROM PAUL EIMON \_\_\_\_\_  
TO \_\_\_\_\_



GENERAL INFORMATION  
PRODUCERS CHEMICAL CORPORATION

375 Park Avenue  
New York, N.Y.  
Phone: (212) 688-1990

Subsidiaries:

Chemical Producers Corporation  
6854 Market Avenue  
El Paso, Texas 79915  
(915) 778-8363

Producers Mineral Corporation  
North San Juan Road  
Safford, Arizona 85546  
(602) 428-1465

Chemical Producers Corporation Officers - El Paso

Reuben Moulds, President  
Arthur J. Parton, Vice President  
E.J. Creider, Plant Manager

Johnathan Schwartz of El Paso, is reportedly a major stockholder and possibly an officer in Chemical Producers Corporation. Schwartz is said to be a very responsible El Paso businessman and head of the SEC Corporation at 10033 Humble Street, El Paso, Texas. The SEC Corporation manufactures dry ice, liquid carbon dioxide, wholesale agricultural industrial chemicals and other commodities. One report suggested connections between SEC Corporation and Chemical Producers Corp., but this does not appear to be more than the association of Schwartz with both corporations.

Acid Operations, El Paso, Texas

The El Paso plant of Producers Chemical Corp. presently operating in El Paso, Texas, has between 40 and 60 employees and is producing 260 tons of 98-99% H<sub>2</sub>SO<sub>4</sub> for sale to the Chevron and Texaco refineries by burning sulfur purchased in West Texas and from waste gases off the Chevron refinery. The acid is reportedly sold to

Texaco and Chevron for \$19.00 per ton and the company is required to buy back the "spent" acid for \$2.00 per ton. Producers Chemical Corp. then disposes of the "spent" or "black" acid in a variety of ways including sale to Producers Mineral Corp. at Safford, Arizona, for leaching copper ore.

In December of 1972 a new ASARCO acid plant in El Paso is scheduled to come on stream and will produce a presumably low-cost acid for marketing in the El Paso area. If and when the Producers Chemical Corp. contract expires, ASARCO will probably undercut Moulds on the sale of acid to these refineries. There is a possibility that Moulds could market the ASARCO acid under his present contract.

#### Labor

Although originally under a union contract (union unknown), Chemical Producers Corp. is presently unorganized. However, on June 29, 1972 a vote will be held of all drivers and other workers in the plant as to whether the plant will become unionized under the Teamsters. An estimated 25-40 employees will vote, and management-labor relationship at the plant are reportedly somewhat touchy because Reuben Moulds has made a number of past promises to the employees which he has not kept. The Teamsters Union has an interest in organizing Producers because of the rather extensive truck haulage of acid.

#### General

Chemical Producers Corp. has not registered in the city-county corporation registration list. No information has yet been obtained on interstate commerce franchise, permits, or leases necessary to haul acid. They have had some past problems with the El Paso Pollution Control Board because of sulfuric acid escaping from their acid plant. A member of the El Paso Pollution Control Board stated that the problem is not now serious and he anticipates that Chemical Producers Corp. will be able to meet future pollution control requirements. There have been past legal conflicts due to damage to paint on cars surrounding the Producers plant, and reportedly Aetna Insurance Company made a \$300,000 settlement with the car owners. It is rumored that Aetna has cancelled this policy and that Chemical Producers Corp. is presently without liability insurance for this type of damage.

### Sales of Spent Acid

Spent acid shipped out of El Paso is reported to have been sold to Cobre Mines, Silver City, New Mexico, at a cost of \$3.00 per ton f.o.b. El Paso. More information on this might be obtained from Paul Johnson, engineer at Cobre Mines in Silver City. Also, before USNR ceased operation at Tyrone, they purchased some acid from USNR at the same price. Inspiration reportedly has bought both virgin acid and spent acid. Virgin acid was reportedly sold to Inspiration in 1970 at a price of \$19.00 per ton f.o.b. Ted Dodge may have information on acid purchased for Inspiration tests at Safford.

Reportedly the virgin acid is +99% H<sub>2</sub>SO<sub>4</sub> and the spent acid 97% H<sub>2</sub>SO<sub>4</sub> or less.

Wellman Lord, process design contractors of Wellman Power Gas Company of Lakeland, Florida, designed the acid plant for Chemical Producers Corp. in El Paso.

### Freight Rates

Freight rates on acid transport from El Paso to Safford can be obtained from:

Whitfield Transportation Inc.  
P.O. Drawer 9897  
El Paso, Texas 79989  
Marion F. Smith, Sales Manager  
(see Local Tariff No. 25-B, Page 64,  
covering Item 4500)

Calculating a distance of about 236 miles from El Paso to Safford, in estimating rates, the haulage rate for acid, El Paso to Safford, should be about \$9.00 per ton. If the acid value is \$2.00 a ton it should be delivered in Safford for \$11-\$12 per ton.

### Financial Condition

It appears that Chemical Producers Corp. is in sound financial condition and as long as they have a contract with the refineries their position should remain strong. It is essential to the petroleum refineries that they maintain a supply of acid. Chemical Producers Corp. should be a profitable enterprise, but its future could be in doubt because of the forthcoming acid source at the ASARCO El Paso smelter. All reports indicate that Producers Mineral Corp. has a questionable credit rating and, at best, is slow in making payments.

The legal implications of the above information will be discussed with Leo Smith and further data will be acquired. Key questions appear at present to be the financial viability of all three corporations, the relationship of the corporations, the actual pricing and value of the acids as traded, and past history of pricing and the disposition of spent acid. Reportedly Chemical Producers has dumped acid on the Texas and El Paso desert. The head of the El Paso Pollution Control Board stated that acid could be dumped on private property if there was no leakage to the groundwater or surrounding areas. He stated that he felt acid could be dumped in areas of caliche where the carbonates would fix all of the acid.

Paul Eimon

PE:td

NOTE: Not all of the above information has been verified.

BY CEO DATE 7/31/72 SUBJECT FEED PREPARATION SHEET NO. 1 OF 2  
CHKD. BY \_\_\_\_\_ DATE \_\_\_\_\_ FLOW SHEET AT JOB NO. \_\_\_\_\_  
PRODUCERS MINERALS - SAFFORD AZ.

OPEN PIT MINE  
DRILL, BLAST,  
FRONT END LOADER  
to DUMP TRUCKS

ORE POCKET  
PAN FEEDER - 36"

JAW CRUSHER

BELT CONVEYOR

6"  
4' SYMONS CONE  
CRUSHER

1/2"  
BELT CONVEYOR

THREE-DECK  
VIBRATING SCREEN

+1 1/2"    1 1/2" x 3/4"    3/4" x 1/4"    1/4" x 0 FINES

BELT CONVEYOR

BELT CONVEYOR

BELT CONVEYOR

2-36" CONE CRUSHERS

3/4"  
BELT CONVEYOR

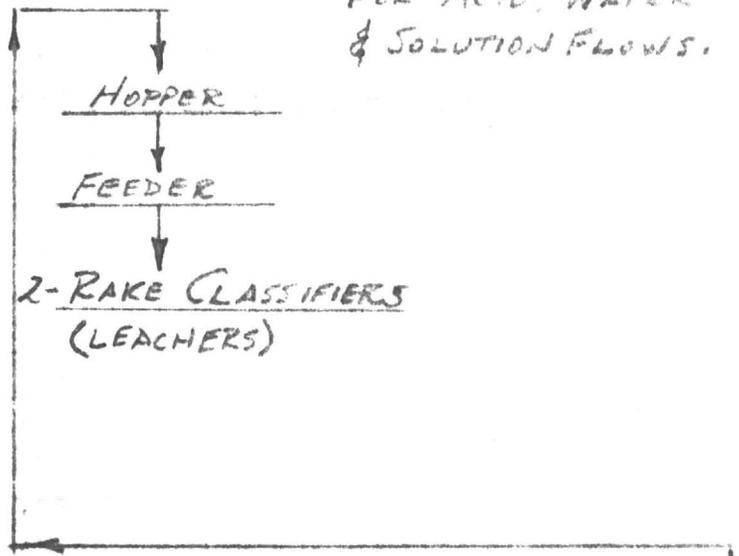
STOCK PILE

STOCK PILE  
FRONT END LOADER

FRONT END LOADER



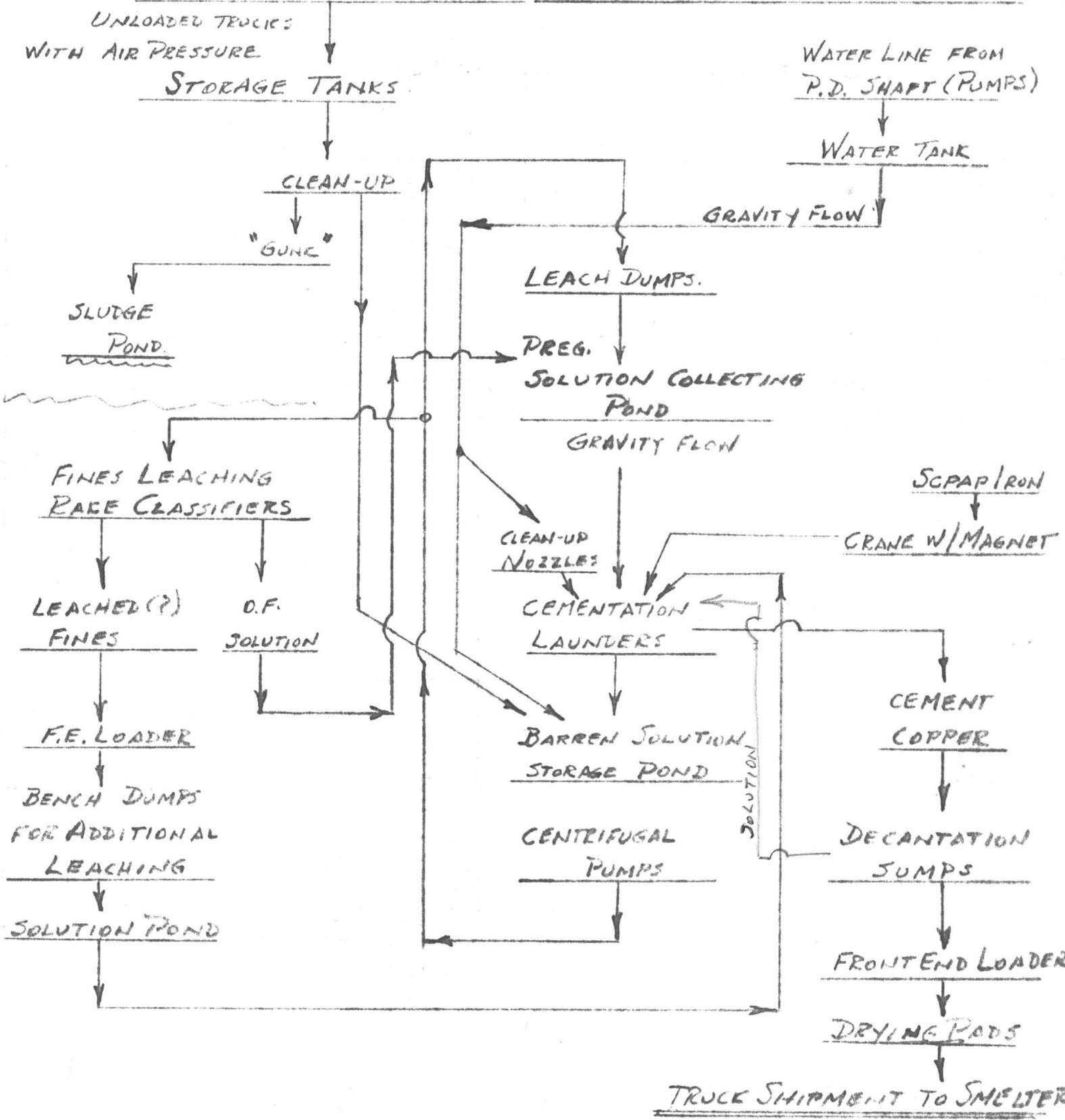
SEE SHEET NO. 2  
FOR ACID, WATER  
& SOLUTION FLOWS.



BY CEO DATE 7/31/74  
CHKD. BY \_\_\_\_\_ DATE \_\_\_\_\_

CALCULATION SHEET SHEET NO. 2 OF 2  
SUBJECT LEACH SOLUTION  
FLOW SHEET AT PRODUCERS MINERALS - SAFFORD AZ  
JOB NO. \_\_\_\_\_

ACID RECEIVED IN TRUCK TANKS - 20 TON LOAD. {ALKYLATED ACID 93% - 97%  $H_2SO_4$ }  
{CONTAMINATED WITH HYDRO CARBONS}



8/16/72

San Juan -

Pouring concentrated acid on ore heaps.

Action reported from the field.

4-5 truck tankers / day

80-100 tons / day.

Concentrated  $H_2SO_4$  is a powerful dehydrator.

Poured on broken ore - ? What happens??

It could be a mess.

Could it be recovered by flushing with water?

- R. Blapp -

Sulphonates

Sulphonites

SO<sub>2</sub>

} complex Cu - are insoluble

120 Tons - / day.

Ron Schuck - at Safford

8/17/72 - no answer 5 PM

Home 428 - 0297

of 428 - 3749 - Inspiration

Paul Eimon

Tucson, Arizona

C.E. Osborn

" "

Sept. 14, 1972

I talked to Mr. Royal Mersener, Supt. of Technical Service for American Oil Company of Salt Lake City, about alkylation acid.

He said it is 89% acid.

American Oil has a contract with K.K.C. to sell 100% of its alkylation acid for use at McGill, Nevada for leaching dump ore there.

Mr. Robert McNally of Kennecott gave Howard and me names of consultants to contact:

1. Dr. Frederick G. Sawyer  
1580 Carriage Road  
Pasadena, Calif. 91107  
(213) 351-8161
2. Mr. Max Spealman  
994 Overlook Road  
Berkeley, Calif. 94708
3. Chemetics Int'l. Ltd.  
P.O. Box 10  
Montreal 101, Quebec, Canada  
Geo. A.A. Locke, Sales Mgr.  
(514) 874-3961

I haven't contacted any of the three listed above.

Regarding selling price of acid from Chemical Producers, Dr. Bhappu tells me that Paul Johnson was charged \$11.00/ton delivered at his operation near Tyrone, N.M., which is about 100 miles nearer El Paso.

TD:CEO

8/15/72

Discussions with Roshan Bhappu -

Mtn. States Eng. Co. - 2:30 - 4:30 Pm  
San Juan Legal - Interrogatories.

Stauffer | Ft. Worth | Spent acid

Clemat Chem. Monument N. M.

Typical analysis

How treated - cost

M<sup>c</sup>Nally - Kennicott

"From the mouths of two witnesses" - HAL

= Bibliography =

$$\begin{array}{r} 23,000 \text{ tons} \\ 30 \overline{) 700,000} \\ \underline{60} \\ 100 \end{array}$$

100 tons / day.

Paul Eimon

Tucson, Arizona

C.E. Osborn

Tucson, Arizona

Leo Smith

Alkylation Acid

Sept. 12, 1972

Conversation with Dr. R. Bhappu

Bhappu has consulted with Geo. Roseveare of the Ariz. Bureau of Mines about the use of the refinery alkylation acid for leaching copper.

Roseveare can be approached to act as an expert as an independent consultant.

Roseveare has done some testing work with alkylation acid but did not reveal the results of Bhappu. He did, however, give Bhappu his opinions on the use of the alkylation acid:

1. It is not good for dump leaching.
2. Even after settling, the so-called "clear" acid still contains considerable amounts of suspended tarry substances which tends to plug the voids in the dumps thus preventing acid solution from contacting surfaces of ore particles and in turn inhibiting the leaching processes.
3. The available acidity is okay.
4. The diluted acid containing hydrocarbons acts as a reducing agent preventing the formation of ferric iron.
5. Ferric (oxidized) iron is essential for leaching certain copper minerals, specifically, cuprite and chalcocite.

Roseveare has done some "column" leaching studies. He might make the results available if he is called in as a consultant.

"Column" leaching is a study used in determining the feasibility of vat leaching on ore.

CEO:td



INTERMOUNTAIN  
CONCRETE SPECIALTIES

425 West 17th South

Salt Lake City, Utah

466-8776

2- 769 B Trucks -

Cats

Empire Machine

40000 lbs

15

3000 gallon

x 6

18000 gallons/day

Dave Belden  
re Borman Tailing

Copper Oxide Ore  
 Tests on XXXXXXXXXX XXXXXXXXXX  
 Comparison Virgin Acid vs. Alkylated Acid

1. Using Virgin acid ....

		Recover
Leach liquor ... 330 ml. @ 1.72 gpl = 0.568 g. Cu	..	83.2%
Tailing ... 47.5 grams .24% Cu = 0.114 "	"	16.8
	0.682 "	100.00
Head sample contained 0.615 g. Cu		

2. Using Alkylation acid ...

Leach liquor ... 419 ml. @ 0.99 gpl = 0.415 g. Cu	..	67.7%
Tailing ... 47.0 grams .42% = 0.198 "	"	32.3
	0.622 "	100.0%
Head sample contained 0.615 grams Cu.		

By adding ferric sulphate to the leaching acids the recoveries were improved as follows:

1. Virgin acid .... 87.8 %
2. Alkylated " .. 86.0 %

83.2  
 67.7  
 -----  
 15.5

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## Sulfuric Acid

1. Sulfuric Acid

Copyright 1965 McGraw Hill, Inc.

Author Oscar T. Fasullo  
Consolidated Chemical Division  
Stauffer Chemical Company  
Houston, Texas

2. Manufacture of Sulfuric Acid

Reinhold Publishing Company

Dept. B 335

430 Parker Ave.

New York 22

Authors Werner W. Duecker  
James R. West

66° Baume Acid is 93.17%  $H_2SO_4$