

CELANESE CHEMICAL COMPANY
Chemcel Plant
Bishop, Texas

PLAINTIFF'S
EXHIBIT

tabbles

CEL-10

To: Dr. R. R. Graham

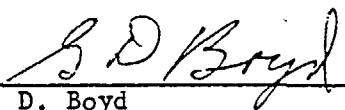
From: G. D. Boyd

GDB-153-81

December 8, 1981

Laboratory Department Summary - November 1981

Attached is the Laboratory's monthly summary for November. The summaries are by groups. A table listing priorities, justifications, and estimated completion dates of Special Problems projects is also included.


G. D. Boyd

GDB:jr

Distribution

Chemical

J. J. Fritsch
W. H. Brough
J. B. Brown
G. L. Cade
R. R. Carpenter
M. W. Clifton
F. R. Dow
R. S. Hahn
W. A. Heenan
B. C. Kerr
C. W. Lee
D. E. Lockwood
A. G. McGehee
W. H. Meyer
A. A. Miller
D. G. Pausky
J. C. Rubiano
G. R. Scholz
D. D. Siemonsma
W. L. Sharp
K. R. Stelts
H. H. Thigpen
L. M. Harvey

Plastics

A. C. Abshier
R. L. Bunkley
H. L. Davis
D. A. Reck
E. J. Heinz

CCCTC

G. J. Fisher
W. E. Heinz
W. T. McNair
Central Files (2)

J. N. Gann, Bay City
J. E. Sanborn, Bayport
J. L. Paul, Clear Lake
D. W. Harris, Pampa
T. H. Golson, Dallas

003618

No: 303.3
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Highlights

- ° Residue in the 37% unstabilized HCHO (TIC-2603 on 11-18-81) was identified as sodium formate. Corrective action was taken by Production.
- ° The Metronics Dynacalibrator has been received and is in operation. Validation of methods for determining formaldehyde exposure has begun. This work is being done in cooperation with the Formaldehyde Institute.
- ° The study to characterize vacuum truck contents has been delayed until a program is established to verify the cleanliness of the trucks upon entering the Plant.
- ° Polyol effluent (13 volume percent in river water) is being successfully treated aerobically. Outfall COD's from the activated sludge system range from 140-250 ppm after a 17-day detention time.

003619

I. ANALYTICAL GROUP

Methanol Oxidation (MO)

The Analytical Section supplied analytical support and manpower for the MO IV start-up. Technicians from the Laboratory were provided for Unit Lab support and training.

Paraform Area

Extensive support was provided by the Analytical Section for the recent Paraform Unit problem. Analyses revealed no abnormal contaminants. The unit was able to operate after switching to MO IV feed exclusively.

Current production of butyl acetate does not meet manufacturing control specs. for butyl propionate. (Levels - ~0.05% compared to 0.01% max. spec.) This is a result of excessive propionic acid in the acetic acid feed recently received from Pampa. Pampa acetic acid was purchased in lieu of Clear Lake acid which was in short supply. Current shipments are being made under waivers from Dallas QC.

Customer Complaints

None this month.

Quality Waivers

11-3-81 - Methylal to Celanese, Bayport Terminal - MeOH content 1.75 wt.% vs. 1.0 wt.% max. - 42,950 lbs. - QD.

11-5-81 - Iso-butyl acetate to Celanese, Newark Terminal - iso-butyl propionate at 0.02 vs. 0.01 wt.% max. - 193,110 lbs. - QD.

11-6-81 - Methylal to Celanese, Bayport Terminal - MeOH content at 1.4 vs. 1.0 wt.% max. - 73,970 lbs. - QD.

11-16-81 - Iso-butyl acetate to Celanese, Celriver Terminal - iso-butyl propionate at 0.02 vs. 0.01 wt.% max. - 194,910 lbs. - QD.

11-16-81 - Para flake 95% to Mobay Chemical Corp., Kansas City, Mo. - Assay 94.6 wt.% vs. 95.0 min. - 45,000 lbs. - SQD.

11-16-81 - Iso-butyl acetate to Celanese, Argo Terminal - iso-butyl propionate at 0.02 vs. 0.01 wt.% max. - 192,560 lbs. - QD.

11-19-81 - n-Butyl acetate to Celanese, Bayport Terminal - n-butyl propionate at 0.04 vs. 0.01 wt.% max. - 299,770 lbs. - SQD.

003620

GDB-153-81
Page Four
December 8, 1981

11-19-81 - Para fine powder to Dycho Co., Inc. Niota, Tn. - Iron content at 2.6 vs. 2.0 ppm max. - 2500 lbs. - SQD.

11-20-81 - n-Butyl acetate to Celanese, Bayport Terminal - n-butyl propionate at 0.05 vs. 0.01 wt.% max. - 192,010 lbs. - QD.

11-23-81 - n-Butyl acetate to Celanese, Bayport Terminal - n-butyl propionate at 0.05 vs. 0.01 wt.% max. - 388,320 lbs. - QD.

11-23-81 - n-Butyl acetate to PPG Stanchem Div., Toronto, Canada - n-butyl propionate at 0.05 vs. 0.01 wt.% max. - 74,500 lbs. - QD.

11-24-81 - n-Butyl acetate to Celanese, Bayport Terminal - n-butyl propionate at 0.05 vs. 0.01 wt.% max. - 192,320 lbs. - QD.

11-25-81 - As above - 193,200 lbs. - QD.

11-25-81 - n-Butyl acetate to Celanese, Newark Terminal - n-butyl propionate at 0.04 vs. max of 0.01 wt.% - 192,310 lbs. - QD.

Product	% QD ¹ Month	% QD YTD	% SQD ² Month	% SQD YTD
Para Fine Powder	0	0.8	0.6	2.1
Para Coarse Powder	0		0	4.5
Diacetone Alcohol	0	1.0	0	0
Formaldehyde	0	0.2	0	0
Sodium Formate	0	0	0	1.1
Pentaerythritol-Tech*	0	0	0	1.2
*(Lube Grade as Tech)				
<u>n</u> -Butyraldehyde	0	0	0	0.3
Para 95% Flake	0	0	78.9	11.1
Methylal	79.5	6.3	0	0
<u>iso</u> -Butyl Acetate ³	100.0	23.3	0	0
<u>n</u> -Butyl Acetate ³	43.8	7.4	0	1.2
<u>n</u> -Propyl Acetate	0	0	0	<0.1

1. Lbs. of product shipped out of Manufacturing Control Specification vs. total lbs. of that product shipped for month and YTD.
2. Lbs. of product shipped out of Sales Specification vs. total lbs. of that product shipped for month and YTD.
3. Ester production out of M.C.S. due to the use of lower quality acetic acid raw material.

003621

Analytical Statistics

	<u>Nov.</u>	<u>Nov. YTD</u>	<u>Previous YTD</u>
<u>Sample Count</u>			
Chemical Section	4477	50391	49746
Instrument Section	<u>2417</u>	<u>29392</u>	<u>25457</u>
Total	6894	79783	75203
<u>Technician Overtime</u>			
Chemical Section	94	632	667
Instrument Section	<u>36</u>	<u>366</u>	<u>398</u>
Total	130	998	1065
<u>Sample Shipping</u>			
Domestic	60	653	695
Export	6	58	30
Plastics	0	11	77
Others	<u>13</u>	<u>115</u>	<u>83</u>
Total	79	837	885
<u>QA Statistics</u>			
Shipments	566	7045	7967
Waivers (QD)	15	39	23
Waivers (SQD)	2	15	25
Complaints	0	15	29

003622

II. STAFF CHEMISTS

Process Technology B. C. Kerr

Technology Manual Revision - Draft copies of the revised Chemcel Plant Technology Manual have been distributed for comments and corrections.

Groundwater Contamination - A preliminary draft for the final ECD report section on Environmental Impact has been submitted to Mr. G. Wallace. Work on text revisions and final report preparation is scheduled for the week ending 12-6-81. A one day trip was made to Austin to discuss some of the details of data analysis with URM, Inc.

Di-PE Recovery Project - No significant progress has been made on this project. Work is continuing.

Preparation of Anhydrous Polyol Solutions of PE - Pentaerythritol is usually marketed as a crystalline or prilled product. However, it has been found that PE has a significant solubility in polyols at elevated temperatures. Test solutions of PE stored at 105-108°C indicate that 14 wt.% PE is stable in TMP and 20 wt.% PE is stable in ethylene glycol. Since it is generally much easier to ship and store liquid products, it is hoped that a market may exist for a properly formulated PE-polyol solution which can be stored and shipped at moderately elevated temperatures. Work is continuing on this project.

Special Analytical F. R. Dow

Formaldehyde Color Problem (Dow, Wise) - During November, MO formaldehyde products have had APHA colors of >5. Methylene chloride extractions and capillary column scans of the products and some related streams have not shown any information that will identify the components causing the color problem.

This is a continuing investigation.

Polyol Feed to BOD II (Dow, Wise) - Polyol effluent was added to the BOD II test pond on November 10, 1981. Capillary and packed column GC analysis was performed to monitor the polyol components as they were added. Very few polyol components have been detected to date, however, TMP has been down and a slight increase may occur when all units are operational.

During November the BOD test pond had a COD of up to 18,000, however, the high COD was due to methanol not the polyol effluent.

Evaluation of an Automatic Sample Injector (Dow, Wise) - A Dynatech Precision Sampling Corp. automatic sample injector has been purchased by the Bishop Laboratory. Use of this autosample injector significantly improves the repeatability of the sample size injected into a capillary column GC. This automatic sample injector does not have a "carousel" for unattended sample injections (it can be purchased with the sample tray), but it is the ideal injector system for lab development projects.

003623

A letter will be written detailing the automatic injector systems and a comparison of the system with Glenco and Kloebe syringes.

Briefly, the standard deviations for sample size (total raw area) of the automatic injector is 1-5% as compared to the Glenco and Kloebe syringe manual injection of 3-35%.

III. SPECIAL PROBLEMS - H. H. Thigpen, O. W. Schnellenberger

Methanol Oxidation, Formaldehyde Blending

J. F. Glenister, T. A. Jasek, R. L. Day

Color in MO Units (Glenister) - The MO Units have experienced a color fluctuation beginning November 9th. Since MO I was scheduled to shutdown, and MO II product is sent to Plastics, experiments treating the color were concentrated on MO III and IV. The "colored" formaldehyde from MO III and IV was treated by: filtration (using different pore size filter membranes), the addition of ethylenediamine-tetraacetic acid (EDTA, metal complexing agent) and adsorption onto activated carbon. Results of this series of experiments indicate the color is not due to iron contamination, and the nature of the colored component is probably organic which does not adsorb onto carbon. The Laboratory is continuing a more extensive investigation to attempt to isolate the source and components causing the presence of higher color (>5) in the formaldehyde product.

Precipitate in Unstabilized 37% Formaldehyde, Tank 2603 (Glenister) - The Analytical Group noted a precipitate in a routine check for metolose in 37% unstabilized HCHO from Tank 2603 on 11-18-81. The precipitate was present in larger quantities than previously noted and appeared as a white crystalline salt. The precipitate was soluble in water and an IR spectrum of the unknown precipitate confirmed it as sodium formate. A probable cause for the precipitate formation was incomplete washing of the weak base anion exchange beds following regeneration with caustic. Operations was informed of the results and proper action was taken to eliminate the NaFo formation.

Evaluation of Possible Liquid Cleaning Agents for Tank Car Cleanings (Glenister) - The Laboratory evaluated four liquid soap samples provided by Coastal Aqua-Chem Inc. for a possible liquid soap replacement for the powdered cleaning agent presently used for tank car cleaning. The liquid detergents were evaluated with respect to pH, biodegradability, foaming height and duration, and residue deposited on drying. These samples were found acceptable in pH, biodegradability, and no residue on drying, but all failed to meet the foam characteristics necessary to process the tank car washing through the BOD system. Coastal Aqua-Chem added antifoam to the liquid sample which showed the most promise and a one gallon sample was sent to the tank car cleaning rack for an in-car trial.

MO IV Startup (Jasek) - The MO IV startup was followed. Also, the Westphal specific gravity balance was recalibrated and tested with "live" samples. Good agreement was experienced between the Westphal balance and the picometer method for determining specific gravity.

HCHO Stability Variability Study (Day) - Studies are continuing in efforts to correlate large variations in HCHO stability to small variations in HCHO assay, acid, color, sodium, iron, and age. These studies do not look promising. Another approach that is being investigated is to correlate HCHO stability with organic impurities in the HCHO. Instrument problems have hampered these studies.

Monsanto HCHO recently received for resale and internal use has been sampled for competitive analyses relative to quality and stability. Monsanto HCHO was found to have a much longer stability time with significant differences in organic impurity levels. Efforts to isolate the Monsanto stabilizer and evaluate it in our HCHO are in progress

Pentaerythritol
L. M. Harvey, B. K. Huelle

Recover PE From VCI Waste Stream (Harvey) - A simple batch flashing procedure was used to remove varying amounts of 2-ethylhexylamine (2EHA) in the extract from VCI's proposed extraction of PE "A" Mother Liquor (AML). This procedure was used to simulate VCI's proposed 2EHA recovery using a wiped-film evaporator. The residues from these experiments were used in shake-out experiments with PE WIP recycle to determine the minimum amount of 2EHA required in VCI's wiped-film evaporator (WFE) residue to facilitate PE recovery. Shake-outs were performed at 100°C with WIP recycle to residue ratios of 3:1, 2:1 and 1:1. Analyses of these experiments is still in progress. A report should be issued in December.

Potential for PE Dust (Harvey) - At the request of Dallas Quality Assurance, two samples of PE having high di-PE contents were sent to Emery Industries, Inc. (Cincinnati, Ohio). One sample was obtained directly from hopper #4 (baghouse dust recycle) and had a di-PE content of 18.0 wt.%. The other sample from the same source was enriched in di-PE by adding another fraction of hopper #4 material which passed through a 200-mesh screen. This sample had a di-PE content of 25.1 wt.%. Celanese personnel involved in customer evaluation of high di-PE blends have been reminded that there is no high di-PE stream available for marketing at this time.

Evaluation of Filter Cloths for the A and B Belts (Huelle) - The evaluation of eight filter cloths from our present supplier has been completed. Two filter cloths, one of which is light-weight in comparison to our present filter cloth, were as efficient as our present cloth. A letter will be published this month recommending that inquiries be made into other cloths with even greater porosities.

1,3-Butylene Glycol
J. E. Russell

T-219 Analytical Method - The development of an analytical method to analyze T-219 overhead and T-219 residue for acetaldehyde, crotonaldehyde, and acetaldol was delayed due to an instrument problem. The instrument problem has been corrected, but the development will still be delayed due to priorities.

003625

Paraformaldehyde
J. E. Russell

Unit Support - The Paraform Unit experienced trouble trying to run on 51% HCHO from tanks 2586 and 2587 beginning November 7th. These tanks contained product from both MO I and MO III. The Laboratory set up an apparatus to run cloud times according to previous work done on paraform feed suitability. The cloud time tests showed mixed results and no conclusion could be drawn by comparing cloud times of different feeds. There may be a stronger correlation of feed suitability to other characteristics of the paraliquid made during the cloud time test. The Laboratory will run a series of experiments to determine if there is a better test for paraform feed suitability. Further experiments will be planned according to the results of the first series of experiments.

BOD - Utilities

P. W. Young, D. R. Akin, J. C. Bustabad, G. R. Stasney

BOD II Support (Young) - Continued support was provided to BOD II operations.

Polyol Treatability in BOD II (Young, Stasney) - A laboratory anaerobic-aerobic system (#3) was acclimated to 7-8% steady state polyol effluent (COD = 10,000-30,000 ppm). Steady state VCI effluent (COD = 4,000-10,000) was added to the feed (OL = 0.28 lbs COD/ft³/day. Aerobic detention time = 2.9 days). The aerobic outfall COD rose to 300-500 ppm. After a month of ~300 ppm COD at an aerobic detention time of 5 days and OL of ~0.18. The VCI was removed from the feed. The OL was lowered to ~0.1 to help with recovery of the system. This reactor will be brought back up to former steady state polyol levels and used to further study only polyol treatability.

VCI Waste Treatability (Young Stasney) - High concentration VCI effluent from their plant washdown (COD ~18,000-35,000 ppm) was fed to the laboratory anaerobic-aerobic system at a concentration of 5.5% of the feed. The outfall rose to 270-380 ppm. This study has been discontinued. Currently, the system is being fed 5.5% steady state VCI and 1% steady state polyol at an OL ~0.1 lbs. COD/ft³/day and aerobic detention time of 5 days. The OL will be raised to ~0.2 and detention time lowered to 2.9 days. Steady state polyol will be slowly added to the equalization basin/VCI feed over the next few months.

Calgon M-502 Flocculant (Bustabad) - The COD of Calgon M-502 flocculant is ~300,000 (as is). The recommended use of the flocculant is at a 10 ppm concentration; thus, the contribution to overall COD is negligible. Information on the discharging of Calgon M-502 shows it not to be a problem; it is potable.

Calgon M-502 Flocculant Evaluation on a Sample From the Aerobic Tank (III)
Fed Polyol and VCI Wastes (Bustabad) - Use of 10 ppm Calgon M-502 flocculant with a sample from the aerobic tank (#3) fed polyol and VCI wastes showed an evident decrease in settling time of solids. Also, the clarity of the supernatant in the sample with flocculant was much improved.

003626

Screening of Polymers for Reducing Total Suspended Solids (TSS) in Clarifier Outfall (Bustabad) - A screening of polymers available from different vendors has begun. Among the polymers from Nalco Chemical Company that functioned most effectively with aeration basin wastes in reducing total suspended solids were 7735, 7135, and P425 in a concentration of ~10 ppm. The polymer available from Betz Chemical Company that functioned most effectively with aeration basin wastes in reducing total suspended solids was Betz polymer #1180 in a concentration of ~10 ppm.

ATP Evaluation (Bustabad) - Various methods for ATP extraction have been evaluated. The method giving best results involves use of a boiling tris buffer solution. Routine ATP analyses were completed for a two week period on aerobic tanks fed VCI (II) and VCI and polyol (III) wastes. This period of data collection was adequate only for gathering base case data.

Aerobic Treatment of Polyol Sump (Akin, Stasney) - A study is under way to determine the feasibility of treating polyol effluent by aerobic methods. A laboratory unit is removing ~95% of COD from a feed with a COD concentration of ~4200 ppm. This feed is 13% by volume polyol effluent and 87% by volume river water. Therefore all of the COD is contributed by polyol effluent. The detention time is at ~15 days with the outfall COD ranging from 160-240 ppm.

Oxygen Uptake Rates in Aerobic Systems (Akin, Stasney) - The oxygen uptake rates (OUR) versus mixed liquor volatile suspended solids (MLVSS) ratios of three laboratory units and the aeration basins at BOD II continue to be followed. Results and recommendations for the use of OUR/MLVSS trends will be published shortly. This study will continue.

Vacuum Truck Content Characterization (Akin, Gonzalez) - In order to develop a system for disposal of vacuum truck wastes, a study was begun in late September to characterize vacuum truck contents. Analyses of these contents include pH, temperature, % solids, % oil layer, and ppm COD. The study has been delayed since the first week in November due to a problem with the cleanliness of the trucks. A program is being developed by S.H.E. for inspection of the trucks before filling. In order to develop an accurate characterization of solids the trucks must be clean before entering the Plant. This study will continue once a procedure has been developed for checking the cleanliness of the trucks.

Lime Pit Hazardous Waste Determination (Akin) - Lime pit material is to be tested to determine if it is a hazardous waste by EPA definitions. The corrosivity, toxicity, and ignitability are all being tested. Results of this determination will be published.

Methanol Synthesis J. C. Bustabad

MEA Corrosion Inhibitor Plant Trial of Solid Sodium Metavanadate - A meeting was attended on November 6th in which Operations, Process Engineering, and Laboratory personnel were represented. A Plant trial was planned in which solid sodium metavanadate will be used as a MEA corrosion inhibitor.

003627

Oxo, Butanol
J. C. Bustabad, J. D. Presley

Phosphate Concentration in Oxo Reactor Solution (Bustabad) - The phosphate concentration in the Oxo reactor solution was determined in a November 5th sample to be 780 ppm. The water extraction was done in triplicate; phosphates were determined by ion chromatography.

Reactor Stability/Accountability (Presley) - Some progress has been made on improvement of the TPP analysis. It is believed that triphenylphosphite is interfering.

Rhodium Accountability (Presley) - Accountability is at least 85%. Reactor level readings are the biggest part of the problem. Accurate reading can only be taken when the unit is down. Exceptionally high rousing is believed to be the reason. T-210 residue rhodium losses to date total 9.96 pounds.

Improved Rhodium Recovery (Presley) - No progress due to priorities.

OSHA
C. E. Gary, K. V. Parker

Noise Exposure Monitoring (Parker) - Noise exposures are being obtained on Maintenance and ABI personnel.

HCHO Methods Validation (Gary) - The Metronics Dynacalibrator 450 has been set up. The Plant air supply was determined to be acceptable, thus eliminating the necessity of using a manifold of bottled air. Work has begun to compare the several chromatropic acid methods that have been or are now being used to obtain previous data. These methods will be compared and evaluated against the CEAS55 and Monsanto DNPH methods.

Esters
B. K. Huelle

Analysis of T-103 Feed and Residue - Process Engineering (D. Estes) has requested composition data around T-103 in order to verify the possible energy savings of eliminating T-103 during butyl acetate production. At present, one week's samples have been completed. Preliminary data show 2.0 wt.% organics in the feed stream and up to .5 wt.% organics in the T-103 residue on certain days. The same data will be collected during a propyl acetate run.

General

• Hub Thigpen visited Dow Chemical in Freeport, Texas (along with Sales, Marketing and Quality Assurance personnel) on November 4th to discuss quality problems associated with our 37% stabilized HCHO.

003628

GDB-153-81
Page Twelve
December 8, 1981

- Hub Thigpen visited Acme Resins in Chicago, Ill. (along with Sales and Quality Assurance personnel) on November 17th to discuss HCHO assay discrepancies between Acme Resins and Celanese.

- Hub Thigpen visited the University of Texas at San Antonio on November 23rd to interview December Chemistry graduates as potential candidates for positions in Celanese.

- Belinda Huelle attended a seminar on liquid chromatography in Houston on November 17-19.

- Frank Dow and Blaine Wise attended a Hewlett-Packard "Capillary Column" seminar in Corpus Christi on November 20, 1981.

- On November 16th and 17th there was technical interchange with the MS chemist from the Celcan Plant in Canada.

003629

Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
Monitor Conversion in the PE Reaction System	Huelle	1	MOB	March, 1982
Support Process Engineering Evaluation of T-103 Elimination	↓	1	Cost Reduction	January, 1982
Recover PE From VCI Waste Stream	Harvey	1	Cost Reduction	March, 1982
Support Efforts to Resolve Paraform Operational Problems	Russell	1	MOB	January, 1982
TMP - Extractor Optimization	Day	2	Raw Material Savings	January, 1982
Formaldehyde Stability	↓	1	MOB	January, 1982
Recover TMP From Formals in TMP Heavy Ends (V-778 residue) Via Alcoholysis	↓	2	Raw Material Savings	March, 1982
Methanol Personal Exposure Monitoring	Gary	1	MOB (Environmental Health)	September, 1982
Area Surveys for Misc. Organics		2	" " "	February, 1983
Industrial Health Formaldehyde Methods Validation		1	" " "	June 1, 1982
Maintenance Noise Exposure Monitoring	↓	1	" " "	January, 1982

003630

Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
Support Polyol Waste Treatment Trial	Young	1	MOB	March, 1982
Conduct Anaerobic Reactor Pulse Test		1	MOB	January, 1982
Polyol/VCI Treatability		1	MOB	March, 1982
Formaldehyde Color Problem	Glenister Jasek	1	MOB	March, 1982
Stability of 37% Unstabilized HCHO (For Dow Chemical)	Glenister	1	MOB	January, 1982
Evaluate Liquid Cleaning Agents for Tank Cars		2	MOB	December, 1981
MO Catalyst Screening	Jasek	1	To Establish Alternate Catalyst	Continuing
GC Methanol Oxidation Reactor Optimization		2	Catalyst Evaluation for Possible	November, 1982
Modified Silver Catalyst		1	Catalyst Efficiency Improvements	February, 1982
Vacuum Truck Characterization	Akin	1	WMSTF Support	January, 1982
TPP, P ₂ O ₅ Emissions		2	Emissions Quantification	April 1, 1982

003631

Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
BOD II Aerobic Optimization	Akin	1	MOB	April, 1982
Evaluate PAC for Aerobic Optimization	↓	2	MOB/Cost Reduction	February, 1982
Document Solar Pond Treatability Study	Akin Young	1	WMSTF Support	January, 1982
Evaluate OUR, ATP, Dehydrogenase Methods	Akin	2	MOB	February, 1982
Support Flocculant Plant Trial	↓	2	MOB	January, 1982
Ni(CO) ₄ Method Evaluation	Bustabad	1	Evaluate Current Shutdown and Analytical Procedure.	December, 1981
Run VI Oxo Trial Extraction	↓	1	Cost Reduction	December, 1981
Extend Run VII Catalyst Life	↓	1	Raw Materials Savings	December 31, 1981

003632