CELANESE CHEMICAL COMPANY
Chemcel Plant
Bishop, Texas

To: C. W. Harrison

From: W. H. Meyer WHM-98-77 October 13, 1977

Laboratory Department Summary
September, 1977

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Laboratory Department Summary

September, 1977

The Bishop Plant Laboratory activities during September are attached. Section I contains a summary of the Analytical Group activities with a table of analytical statistics. Section II contains a Quality Assurance Summary and a table listing shipments, quality waivers, quality complaints and sample shipping statistics. Section III describes the status of Special Problems Group projects by Unit Chemist assignment. A table listing the priorities, justifications and estimated completion dates of current Special Problems projects is also included in Section III.

W. H. Meyer

W. H. Meyer

WHM/jm
Attached Report

003112

I. ANALYTICAL GROUP

Competitive Evaluation

A sample of Japanese pentaerythritol was received from Spencer-Kellogg Co. The material was similar to our technical grade PE with the exception of a high Formcel content of 10.8% (Chemcel spec is 2.0% max.), and an ash content of 0.024 (Chemcel spec is 0.01 max.).

Polyol

1,3-BG - Samples of the jet condensate and T-224 residue system were checked for ppm nickel content by atomic absorption methods. This was in search for the source of a high nickel excursion in the BOD unit test pond basins. The BG unit systems were free of nickel.

Oxo, BuH, BuOH

The Analytical Group has assumed the rhodium analysis requirements on samples of the Oxo unit reactor and T-210 residue.

Utilities and BOD

Letters were issued this month outlining the specific responsibilities of the Laboratory and Utilities Departments concerned with the EPA and TWQB outfall permit reporting requirements. (See JMS-994, WHM-90-77 and JHH-11-77)

The revised outfall monitoring and report worksheet will be put into service October 1, 1977.

See attached Analytical statistics

Analytical Statistics

Sample Count	Sept.	Sept. Y-T-D	Previous Y-T-D
Chemical Section Samples	5,232	44,773	35,859
Instrument Section Samples	2,898	21,356	18,908
Total	8,130	66,129	54,767

Technician Overtime:

Chemical	74	633	568
Instrument	60	604	447
Total	134	1,237	1,015

II. QUALITY ASSURANCE

PE Pure - A customer complaint was received from DuPont (Wilmington, Delaware) concerning three shipments of PE Pure to their Louviers, Colorado, location. The customer reported their Mono PE values to be low (in the range of 93-95%). This was their first attempt at G.C. analysis of PE. After rechecking shipment retains and analyzing the three samples returned to us from DuPont, our values originally reported were confirmed at 99.0% Mono PE. G.C. technology and operating parameters were given to inidviduals at DuPont for their use to check the PE Pure product. DuPont has now verified the analysis as reported to them, and withdrew their complaint. A full report is in preparation.

PE Dust Sample for Tenneco Chemical Co. - A special sample request for five pounds of PE Pure (dust collection fines) for Tenneco Chemical Co. has been planned (HHT-18-77). The material to be shipped will be from our hopper number 4 (isolated from the area dust collector). The type of dust originally requested in J.C. Scott's teletype number 1451, dated July 12, 1977, will not be available for shipment as formerly planned.

PE Tech Shipment to Emery Industries - On September 15, 1977, Dr. J. C. Trebellas reported a customer complaint from Emery Industries regarding PE Tech high ash content at 115-118ppm on Lot 77-217 1T. The customer also reported a high Mono PE content at 90.0%. Analysis of the Lot retain confirmed that the customer values for ash are valid. Results obtained were 120-140ppm, compared to the original value reported at 10ppm. The Mono PE content was rechecked and found to be 87.6%. Obviously, the original analysis for ash was in error, however, the Mono PE value was not as high as reported by Emery. Emery kept the material, but will not accept anymore at the high level of ash (greater than 100ppm). A detailed report has been issued (HAD-29-77).

n-Butyl Acetate - At the request of Houston Sales and New York Quality Assurance, an evaluation was made on our n-butyl acetate for Texas Instruments special specification for "residue after evaporation", 20ppm maximum. Since we now take a residue product instead of a distillate in the purification step, the need for this evaluation is apparent. The values found were less than 10ppm, and we should have no problem meeting this requirement. The data was reported in HAD-26-77.

Formaldehyde Product - Tank car CELX 13232 was shipped to Reilly Labs, Indianapolis, Indiana, with 52% formaldehyde (HCHO) on August 15, 1977. Reilly Labs reported that they off-loaded all except a heel of about 1,500 gallons. The car return was authorized by New York to be sent back to Bishop with the heel. The car arrived at Chemcel on October 3, 1977. The Shipping Service Department reported that the car contained approximately 9,000 pounds of a semi-solid Paraform mixture which they are trying to put into a water solution. The material has large lumps present. Attempts to analyze the retain were unsuccessful, as the material could not be put into solution. A report will be issued when recovery attempts are complete.

Borden Methyl Formcel - On August 25, 1977, a sample of Methyl Formcel was received from Rohm and Haas and was identified as Borden Methaform 55B. This identification immediately suggested that Borden must make a 55A. Requests were sent to New York through Dr. J. C. Trebellas for information on specifications for the two types, and for acquisition of a sample of the 55A, if possible. Mr. D. J. Foley has sent out a letter to Field Sales requesting the samples and/or specifications for these products. We are holding the report on the Borden 55B (typical of our caustic treated Methyl Formcel for American Cyanamid) until we receive the second sample.

Methyl Formcel - Uniroyal - Effective Monday, October 3, 1977, we will report to Uniroyal the quality of the 55% Methyl Formcel before the addition of acetic acid, and the calculated amount of acetic acid added as a per cent of the shipment. The blend will not be preblended to the shipping date (reference: WHM-85-77).

n-Butyl Formcel - Cook Paint and Varnish received car number CELX 4235 with a slight cloud. The retain sample of this shipment was evaluated and found to contain a slight cloud which could not be entirely cleared by heating. The customer rejected the material, and the shipment will be replaced. CELX 4235 will be brought to Argo for filtering and storage. This haze is not typical of our n-Butyl Formcel.

Lehn and Fink Products Co. - The status of this customer's complaint is unclear. On August 1, 1977, Mr. Burns of Lehn and Fink complained about two lots of Paraform flake on which they report an assay of 80.8wt. %. We pulled the retains of the two lots (189 and 194-77), and found the material to assay at 93.0%. This problem appears to be an analytical discrepancy. We agreed to do an exchange

of samples with the customer, and as per JCS-121-77, sent samples of our retains of Lots 194-77 and 189-77. To date, we have not received any samples from Lehn and Fink Products Co. to complete our part of the program.

Paraform Powder to Tennessee Eastman - On August 11, 1977, we received a complaint from Tennessee Eastman at Kingsport, Tennessee, that 200 bags shipped to them on June 7, 1977, out of Lot 2442 were causing a balling-up in their process. They stated the product was lumpy. They said they could not use the material and wanted a replacement (which they received). Evaluation of the Lot retain and a sample returned to us found the material to be specification product. During the past week, the New York Quality Assurance office reported that Tennessee Eastman has withdrawn their complaint.

Sample Shipping and Quality Assurance Statistics follow:

Sample Shipping and Quality Assurance Statistics

Sample Shipping	Sept.	Sept. Y-T-D	Previous Y-T-D
Domestic	39	824	872
Export	2	79	140
Plastics	4	63	106
Other	7	709	206
Total	52	1,675	1,324
Shipments (Number of Orders)	986	7,748	6,821
Delayed Due to Quality	2	24	29
Quality Waivers	5	38	12
Quality Complaints	5	47	18
Quality Complaints Accepted	2	14	9

Note: See attached copies of Quality Complaints and Delayed Shipments due to quality or quality waiver.

Customer Complaints Due to Quality
September, 1977

Date	Customer/Plant	Product	Tank Car Tank Trailer Solids	Complaint	Comments
8/30/77	Chemco	Paraform Flake	Lot 159-77	Lumps - Insoluble in H_2O at 195°F. pH high at 7.2	No follow-up information. Complaint not justified at this time.
9/7/77	DuPont, Inc. Louviers, Colorado	Pentaerythritol Pure	Lot 77-185-3P Lot 77-199-1P	Low Purity	Samples of these lots shipped to DuPont received and analyzed. Complaint not valid.
9/15/77	Emery Industries Cincinnati, Ohio	Pentaerythritol Tech	Lot 77-217-T1	High ash, Low purity	Customer reported 115-118ppm ash vs. our spec max of 100ppm. Customer has special requirement at 50ppm. Original analysis reported 10ppm. Analysis of retain confirmed high ash(112-114ppm). Customer reported they will use material. Valid complaint.
9/22/77	Reilly Labs Indianapolis, Indiana	52% Formaldehyde	CELX 13232 (20M)	Could not unload all material because of solids.	Customer unloaded all but 2,000 gallons (approximately). Tank car on way back to Bishop.
9/26/77	Cook Paint and Varnish Detroit, Michigan	Butyl Formcel	CELX 4235 SD-9/8/77	Slight Cloud	Customer received car and found it to be cloudy. Retain check shows a slight cloud, but no more than a previous shipment. Customer reports product does not clear on heating. Rejected shipment. Car sent to Argo for filtering to storage.

Quality Waivers and Shipments Delayed Due to Quality
September, 1977

Date	Product	Customer	Destination	Tank Car Tank Trailer Solids	Delay or Waiver	Comments
8/29/77	Pentaerythritol Tech	Port of Houston	Houston, Texas	1100 x 50 lb. Export	Waiver	Mono PE content high. at 91.5wt.%.
9/6/77	37% HCHO 20% MeOH	Kingsmill	Pampa, Texas	Tank Trailer	Delay	Delayed 1 day due to low assay and low MeOH, but shipped next day with Pampa OK.
9/9/77	Pentaerythritol Pure	C. Itoh and Co.	Corpus Christi, Texas	500 x 50 lb. Lot 222-3P	Waiver	High ash content at 0.020 (spec=0.010). Approved by NYQA.
9/9/77	Pentaerythritol Pure	Port of Houston	Houston, Texas	100 x 50 lb. Lot 222-3P	Waiver	High ash content at 0.020 (spec=0.010). Approved by NYQA.
9/14/77	Pentaerythritol Tech	Celanese Polymer	Louisville, Kentucky	400 x 50 lb. Lot 252-T_1	Waiver	High formals. Approved by NYQA.
9/19/77	Paraflake	Port of Houston	Houston, Texas (Export)	1800 x 50 lb. Lot 195, 196	Waiver	Assay high at 93.3-93.7 vs. 93.0 spec. Approved by NYQA
9/27/77	44% Uninhibited HCHO	Plastics Mfg. Co.	Dallas, Texas	CPU 578	Delay	Product below quality for Plastics. 6-hour delay. Customer recalled CPU 578 empty. Product order filled 9/28/77.

III. SPECIAL PROBLEMS

Methanol Oxidation, Formaldehyde Blending
A. J. Branecky, J. D. Presley

MO Efficiency Increase with Trace Amounts of Halogenated Hydrocarbons - The data from the methylene bromide and methylene chloride plant tests has been organized and a report written. Issuance should be in October or November. Plant testing this project has been discontinued until additional lab work can improve analytical detection. Work continues.

MO Catalyst Reuse - During this month's MO-IV turnaround, eight catalyst beds were set aside for in-place catalyst washing. One of the eight was too severely contaminated by carbon to be of any value. Of the remaining beds, three were washed in place with a high pressure water stream; two were washed with water and then 6 N hydrochloric acid, and again with water; and two were washed with water and then with 2 N hydrochloric acid, and again with water. In the case of the latter four beds, enough water was used in the final wash to remove all of the acid.

Due to unfortunate mechanical difficulties during startup, five of the beds had to be taken off line. Only a water washed bed and a 6 N HCl washed bed were left. Results, few as they were, showed that the washed beds demonstrated new catalyst efficiency at startup. Since new catalyst requires a certain aging time, (2-4 weeks), before demonstrating peak efficiencies, catalyst washing has demonstrated a distinct advantage.

In this particular plant trial, the reactors were physically removed from the MO unit (due to cleaning necessities during turnaround). This practice is not particularly favored in the catalyst washing procedure due to possible bed cracking and excessive contamination. Work continues.

MS-II Crude to MO - Piping modifications for the plant trial have been completed. However, due to low formaldehyde inventory (approximately 10 MM gallons), the plant trial has been postponed until November.

Water Injection to MO - No progress due to priorities. This project will no longer be carried as a seperate item in the Lab monthly report. Since MS-II crude to MO is in effect, future discussion of water injection will be under that heading.

Pampa Pipeline Grade Methanol to MO - A letter was received from Pampa stating that the possibility of relieving them of excess MeOH is off until next summer. If the need to take Pampa MeOH ever becomes apparent, a plant test should be conducted as outlined in JDP-03-77. Lab work has been terminated.

MO New Catalyst Screening - Engelhard Lot 36 silver catalyst containing 14ppm tin (JDP-01-77) was placed in twelve MO-IV reactors after the recent unit turnaround. To date, these reactors are functioning normally as compared to standard new catalyst. These reactors will be monitored for the life of the catalyst.

During the last turnaround in MO-II, several of the reactors were charged with Engelhard Lot 189 catalyst for startup. From the beginning, the reactors charged with Lot 189 demonstrated poor efficiency and high acid make. Some of the beds were changed out with fresh Lot 189, but they too showed rpaidly deteriorating efficiency. Samples of the catalyst were analyzed by atomic absorption, and very close agreement was found with the Engelhard Certificate of Analysis. The only difference noted in the catalyst was the structure of the individual crystals (silver needles). They appeared coarser than is usually observed. Also, even though the lab sinter test was good, the catalyst failed to sinter properly in the unit. Further attempts will be made to determine the cause of the poor performance of this catalyst. Work continues.

Reduce Methylal Formation in
The MO Distillation Columns - No progress due to priorities.

Nepera Blend - Variations of water composition and of techniques of blending have been studied. The optimum blend ratio to date is:

Weight %	Component
45.9	Acetaldehyde
23.5	Formaldehyde
8.4	Methanol
22.2	Water

This, quite fortunately, equates to starting with 50% formaldehyde. The technique most suitable for blending is in two steps:
(1) Premix the proper amounts of 50% formaldehyde and methanol and allow this mixture to cool to 85-90°F. The methanol concentration in the mix is sufficient to stabilize the formaldehyde at this temperature range.
(2) The "cooled" number (1) is then mixed in line in the proper proportion with the acetaldehyde. Heat of mixing of the blend results in

about an 8°F rise. The final blend is pumped to a storage vessel or tank car. The vessel will have to be filled under pressure with provision made for venting at about 50 psig. The vent will be rich in acetaldehyde due to its high volatility (somewhat lowered by water). Thus, provision for vent recovery will be necessary.

It appears that analytical accountability of the blend will be extremely difficult. A report is being prepared.

Nepera Blend - Analytical - F. R. Dow - G.C. analysis has shown poor reproducibility for the AcH, MeOH, HCHO and H_2O. This may be caused by the instability of the blend and some AcH loss due to handling.

Currently, the repeatability spread for the blend components is approximately 2wt.% for AcH and 1wt.% for each of the remaining components (MeOH, HCHO and H_2O).

Impurity buildup has been severe with some one week old blends showing more than 2%. The impurities are tentatively identified (by G.C. column elution time) as 1,4-dioxane, p-aldehyde and m-aldehyde.

Utilities, Raw Materials, BOD
S. G. Smith

Purchase Specification Update - No progress due to priorities.

BOD Unit Analytical Methods Manual - A revision in the method for measuring oxygen uptake rates in the aeration basins is being studied.

Anaerobic Pilot Testing of Chemical Waste - A project meeting for biological waste water treatment was held at CCCTC with representatives of other Celanese plants for a review of anaerobic technology progress at all locations. Work on anaerobic piloting at Bishop is still in abeyance until the decision is made as to which technology will be used for the proposed Bishop BOD expansion.

DAA Color Stability - A laboratory simulation of T-285, the DAA heavy ends column, is being operated at different pressures, as part of a study to find optimum operating conditions. Further work is planned to determine if heavy ends (color precursors) are being passed over to the finishing column T-294, causing color instability of the finished product.

Elimination of Lamella Underflow - No progress due to priorities.

BOD Unit Support - A method for the laboratory instrument COD analysis is being written to insure a more accurate measurement of the equalization basin COD since loading to the aeration basins depends on this value. An incorrect COD value could cause excessive loading to the aeration basins.

Problems with the measurement of oxygen uptake rates in the unit lab were solved by the replacement of the oxygen probe and TEA solution.

OSHA Monitoring
J. M. Jackson

All job descriptions in the Chemical and Plastics Companies have been evaluated for formaldehyde exposure. A report was issued outlining proposed sampling requirements.

A meeting was held with the Plastics Company to discuss asbestos sampling. Results were: 1) coordinated effort with Production (Plastics) to obtain relevant asbestos samples, and 2) recommendation on possible methods for obtaining necessary data for an EPA permit.

Additional formaldehyde samples were taken with Mr. Birkner Corporate Industrial Hygienist. These samples were sent to Glidden Durkee for analysis by dimedone. The duplicates were evaluated by chromatropic acid at Bishop. No comparison of results have been made to date. A report will be issued.

Equipment for the OSHA monitoring program is being received. As time permits, the instruments will be put into service. Currently CCCTC is awaiting delivery of a continuous formaldehyde monitoring instrument (CEA 555) for validation work.

Esters, Methylal, Paraform, Formcels
R. G. Hilbrich

Paraform, Formcels, and
Ester Unit Analytical Manual - No progress due to priorities.

Paraform Material Balance - Delayed, pending full-time Process Engineering coverage on the Paraform Unit.

Alternate n-BuAc Process - No progress due to priorities.

New Paraform Market - Stein-Hall has found that specially treated Paraform powder is useful as a water soluble fluid loss agent in the hydraulic fracturing of oil formations. Samples of specially treated Paraform were received at the Laboratory for comparison with our typical powder. The specially treated material was found to be similar to fourteen month old Paraform fine powder. Paraform fine powder of various ages (three to fourteen months) was sent to Stein-Hall for evaluation as a water soluble fluid loss agent. A report is in progress.

Paraform, Formcels Unit Support - A study is underway to determine if Formcel reactor blending can be controlled by continuously monitoring the specific gravity of the blend. Work continues.

Acetate Unit Support - The monitoring of acid in the organic layer versus conductivity of the water layer in the overhead receiver of the acetate reactor column continues as workload allows.

A method for determining cupric and cuprous content in the acetate reactor was evaluated. The method as written was not suitable. It has been recommended that cupric phosphate be added to the reactor as corrosion inhibitor and a method is necessary for determing when addition of cupric phosphate is necessary. Other potential analytical methods will be tried as time permits. The possibility of using a corrosion probe to determine when additional cypric phosphate is necessary should be considered.

1,3-Butylene Glycol, DAA
A. E. Hancock

1,3-BG Unit Support - The BG unit attempted a rate run last month. The unit ran at full capacity (40 MM lbs./yr.) for several days. The acetaldehyde recovery column (T-135) was a major problem. The column has been in an upset condition since the beginning of the run. Diethylene glycol dilaurate antifoam was replaced with GE 60 antifoam to try to stabilize T-135. Work continues to determine whether T-135 will operate at the rated capacity of the unit.

1,3-BG Cost Reduction - Data is being reviewed which may indicate the feasibility of replacing the vapor sidestream from the BG finishing column (T-227) with a liquid sidestream or residue stream.

DAA Unit Support - No lab support was needed.

DAA Laboratory Reactor Study - A report is in progress on the effects of water in the acetone feed to the DAA reactors.

Pentaerythritol
R. G. Briell

PE Efficiency - No progress due to priorities.

PE Color - Color removal by the carbon bed charged on June 25, remains satisfactory. An economical bed life has been demonstrated. Through September 30, about 950 pounds PE per pound carbon has been produced using the current carbon charge. Economics were based on about 630 pounds PE per pound of carbon.

Throughout most of the month, "B" filtrate color was consistently in the 17-19 PtCo units range, which should correspond to a 3 1/2-4 PtCo units range in Pure PE product (5% solution). However, at the end of the month "B" filtrate color began creeping higher to about 22 PtCo units. Therefore, we expect to see color rising steadily in October, and a complete depletion of the carbon bed by mid-October. A detailed report will then be issued.

Sulfate in PE "A" Mother Liquor - Monitoring for sodium sulfate in the AML stream being shipped to Virginia Chemical Co. continued. The acid digester temperature is currently held at about 245°F. There was a problem of high sulfate for several days due to a problem with the "A" filter. Correction of this problem reduced the sulfate in AML to about 0.2% (contained salt basis) during tech and 0.5-1.0% during pure. We will continue to monitor this stream and continue efforts to meet Virginia Chemical's request for a maximum of 0.5% sodium sulfate in the AML sodium formate (contained salt basis). A report will be issued in late October or early November.

Trimethylolpropane
L. Mayerle

TMP Unit Support - No lab work.

Alternate TMP Purification System - Distribution coefficients for compounds in T-204 residue were determined in laboratory shake-out experiments and verified the feasibility of the alternate purification system. Further work is pending the availability of equipment for a laboratory unit to simulate recycle streams with an extraction system.

Methanol Synthesis
F. R. Dow

Fuel Gas Quality - The carbon in V-1366 (one of the Selas reformer carbon beds) was changed because the sulfur analysis had shown H_2S break-through (from 0 ppb to >300 ppb H_2S) in less than 48 hours of use. Samples from the upper and lower sections of the carbon bed were extracted for oil content to determine regeneration effectiveness and bed condition. The upper carbon bed sample contained approximately 3wt. % extractable oil, while the lower sample contained <0.5wt. %.

The two samples have been sent to CCCTC for sulfur analysis by x-ray.

MS-II Analytical Support - Two sets of samples from the DPG, Selas and combined reformer gases were analyzed in the Lab for comparison with the process analyzer. The difference in CO_2 analysis reported last month continues to be present.

Last month the Lab was showing about 1 vol. % higher CO_2 values than the process analyzer. The two sets of samples for September each showed the Lab CO_2 value to be about 0.5 vol. % higher than the process analyzers.

Other priorities have delayed additional work on this project.

Oxo, Butanol, Propanol
A. J. Bacon

Oxo Reactor Accountability/Stability - A secrecy agreement was obtained with Witco, and a 5.5 lb. sample of run number 3 catalyst was sent to their Houston Lab to be tested for foam causes.

Rhodium Accounting - Work-up of catalyst samples taken during the run number 3 dump was completed, and a rhodium accounting report was issued with Production. Recovery was poor. Out of 136.18 lbs. rhodium added to the reactor or on hand elsewhere, 95.4 lbs. was returned to Engelhard for recovery.

The Lab and Production Departments have set up a rhodium accounting program to try to detect losses as they occur during a run. This will include sufficient analysis of reactor catalyst and T-210 residue to allow a weekly rhodium accountability calculation. (An AVO for a continuous sampler for T-210 residue has been written.)

A similar program was carried out for run number 3, but needed data was not obtained for the last part of the run due to priorities. Training of four technicians in the necessary analytical procedures is nearly complete, so that these gaps can be avoided.

Oxo, Propanol, Butanol Support - Engelhard's analytical results for their assay of shipment number 9 rhodium nitrate were much lower than those of Ledoux. Our own analyses agree closely with Engelhard's. We suspect a systematic error in analytical procedures or a real decrease in assay with time. We have begun close work with Ledoux, and hope to resolve the problem next month.

Preliminary work has begun on ash samples from run number 3.

Process Technology
B. C. Kerr

Technical Report Abstracting - Preparation of technical report abstracts is current. Preparation of abstract cards will be carried out when enough abstracts are collected to best utilize typist's time.

Production Initiated Process Technology - No progress can be reported this month. New alternatives are being sought.

Customer Support - Technical assistance was provided to Commercial Products concerning depolymerization characteristics of Paraformaldehyde. A letter was issued (BCK-23-77, September 6, 1977) giving details of the problem.

BOD Unit Data Evaluation - Assistance was provided in the evaluation of BOD unit data. See the section on Utilities for a discussion of the BOD unit problem.

Miscellaneous

Leanne Mayerle, Ronnie Hilbrich and Bill Meyer toured the Bay City and Clear Lake Plants and the Bayport Terminal facilities as part of the Technical Department's training program for Chemists and Engineers.

Susan Smith attended the University of Texas course on Biological Treatment of Wastes.

Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
MO Efficiency Improvement with Trace Amounts of Halogenated Hydrocarbons	Presley	1	Raw Material Savings	Undetermined
MO New Catalyst Screening		2	To Establish Alternate Suppliers and Improve Catalyst Quality	Continuing
MO Catalyst Reuse		2	Reduce Silver Inventory	January 1, 1978
MS-II Crude to MO		1	Steam Savings	Plant Testing Complete by December 1, 1977
Reduce Methylal Formation in MO Distillation Columns		1	Raw Material Savings	Plant Testing by February 1, 1978
Pampa Pipeline Grade Methanol To MO		1	Completed	Completed
Nepera Blend		1	New Sales	Lab Work Complete by November 1, 1977
BOD Analytical Methods Manual	Smith	2	Maintenance of Business	December 31, 1977
Anaerobic Pilot Testing of Chemical Waste Streams		1	To Test Anaerobic Process as Alternate BOD Expansion	January 1, 1979
Purchase Specification Update		2	Maintenance of Business	May 1, 1978
Elimination of Lamella Underflow		2	WTTF Objective	May 1, 1978

Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
DAA Color Stability	Smith	1	Cost Reduction	June 1, 1978
OSHA Monitoring	Jackson	1	Ensure Employee Health and Safety, OSHA Compliance	Continuing
Paraform Material Balance	Hilbrich	2	Possible Raw Material Savings	December 1, 1977
Paraform - Formcel Support	↓	1	Maintenance of Business	Continuing
Acetate Unit Support	↓	1	Maintenance of Business	Continuing
Alternate n-BuAc Process	↓	2	Steam Savings	January 1, 1978
Paraform, Formcels, Esters Unit Analytical Methods	↓	2	Maintenance of Business	December 1, 1977
1, 3-BG Unit Support	Hancock	1	Maintenance of Business	Continuing
1, 3-BG Cost Reduction	↓	1	Cost Reduction	December 1, 1977
DAA Unit Support	↓	1	Maintenance of Business	Continuing
DAA Laboratory Reactor Study	↓	1	Increase Unit Capacity And Steam Savings	November 1, 1977

Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
PE Efficiency	Briell	1	Raw Material Savings Plus Increased Capacity 2-4% Potential Increase	January 1, 1978
Lower Sulfate in PE AML	↓	1	Comply With Virginia Chemical Company Request	November 1, 1977
PE Unit Support	↓	1	Maintenance of Business	Continuing
PE Color (Evaluate Carbon Bed Performance)	↓	1	Maintenance of Business	November 1, 1977
Alternate TMP Purification System	Mayerle	1	Raw Material Savings	February, 1979
TMP Unit Support	↓	1	Maintenance of Business	Continuing
Fuel Gas Quality	Dow	2	Improve Fuel Gas Accountability	Continuing
MS-II Analytical Support	↓	1	Maintenance of Business	Continuing
Nepera Blend Analytical Support	↓	2	New Sales	Lab Work Completed By November 1, 1977
Oxo, Butanol, Propanol Support	Bacon	1	Maintenance of Business	Continuing
Oxo Reactor Accountability/Stability	↓	1	Improve Reactor Control	Continuing

Current Special Problems Projects

Project	Chemist	Priority	Justification	Estimated Completion Date
Rhodium Accounting	Bacon	1	Maintenance of Business Catalyst Savings	Continuing