



UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

P. O. BOX 471, TEXAS CITY, TEXAS 77590

June 9, 1977

Mr. Dennis Haverlah
Permits Section
Texas Air Control Board
8520 Shoal Creek Boulevard
Austin, TX 78758

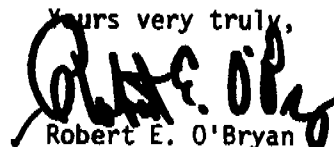
Dear Mr. Haverlah:

Subject: TACB Construction Permit Application - Fuel Conversion, No. 2
Powerhouse - Boiler No. 23

Per our April 12th meeting, attached for your preliminary evaluation is a General Application Form PI-1, Table 4 (Combustion Units), and Table 6 (Boilers and Heaters) covering our proposed fuel conversion project which would allow us to burn up to 0.7% Sulfur content fuel oil at our No. 2 Powerhouse Boiler No. 23. As discussed, the results of your preliminary evaluation with regard to the presently proposed revisions to TACB Regulation II will be conveyed to us so that we may thoroughly examine any project changes, if any, which might be needed to obtain TACB Construction Permit approval.

In brief, Boiler 23 will be converted to oil burning capabilities by burner revisions, soot blower additions, opacity monitoring equipment and instrument additions. Oil handling facilities will include a day tank, heat exchangers, pumping facilities, and interconnecting piping. All facilities will be heat traced and insulated. Additional information will be submitted to your office as soon as specific engineering data becomes available regarding this project. If you should require any additional information, please feel free to contact me.

Yours very truly,



Robert E. O'Bryan

REO:ir

Attachments

cc: Clark Benson
Lloyd Stewart

bcc: Mr. J. F. Erdmann/Mr. J. B. Leverton/
Mr. F. S. Provenzano/P. M. Files

Mr. G. R. Halter
Mr. L. E. Kibbee - 511
Mr. J. D. Martin - 510
Mr. A. W. McCloy
Mr. J. V. Murray - 501
Mr. R. L. Wright - 510
Mr. L. D. Pell
Mr. C. O. Steinmetz
Mr. R. Van Mynen
Mr. V. F. Villani - 511

BCC Note

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As recommended by J. D. Martin and R. L. Wright, this application is being submitted prior to DOF issuance in order to avoid complications with possible future regulations. In addition, certain supplemental information to complete this permit application will be required for submittal to TACB before the construction is completed and an operating permit can be applied for. We will be advised by the TACB what they will require in this instance. Attached is a copy of the proposed revisions to TACB Regulation II.

TEXAS AIR CONTROL BOARD
FORM PI-1, GENERAL APPLICATION
(Read Instructions Before Completing.)

I. PERMIT TO BE ISSUED TO: UNION CARBIDE CORPORATION, Chemicals and Plastics

(Corporation, Company, Government Agency, Firm, etc.)

Mailing address: P. O. Box 471, Texas City, Texas 77590

Individual authorized to act for applicant: Name: Robert E. O'Bryan Title: Process Engineer

Address: P. O. Box 471, Texas City, Texas 77590 Telephone: (713) 945-7411 ext. 1362

II. LOCATION OF PERMIT UNITS (Latitude and Longitude must be to nearest second):

Name of plant or site: Texas City Plant Street address (if available): 3301 - 5th Avenue South

Nearest city: Texas City County: Galveston Latitude: 29° 22' 19.5" Longitude: 94° 56' 33.5"

III. TYPE OF OPERATION OR PROCESS OF PERMIT UNIT:

A. Name of operation or process of permit unit: Fuel Conversion, No. 2 Powerhouse - Boiler No. 23

B. Permit unit identification number: _____

C. Type (check one): ☒ Permanent ☐ Portable

D. Operating schedule: Hours/day 24 Days/week 7 Weeks/year 52

IV. PERMIT UNIT CLASSIFICATION (Check applicable blocks):

A. ☒ New Permit Unit: Proposed start of construction 4th Qtr 1977 Start of operation 4th Qtr 1979
(Date) (Date)

B. ☐ Modification of Permit Unit

C. ☐ Change in Location

D. ☐ Change in Ownership

E. ☐ Permit Unit Now Operating Under Permit Number R- _____

V. If Items IV.A, B, or C were checked, submit the following information under either A or B:

A. Data requested in B1, B2 and B3 has been previously submitted under Permit No. _____

B.1. Submit three copies of an area map to approximate scale showing the location of the property, the land use designations for adjacent and nearby lands which may be affected by the emission, geographical features such as highways, roads, streams and significant landmarks, distance to the center of nearest city or town if located outside an incorporated municipality. If the property is located within a town or city, a city map may be used to present this information, and if outside a town or city, a county highway map may be used. County highway maps may be ordered either through the Texas Highway Department, Austin, Texas or through the State District Highway Engineer for the county.

B.2. Give a legal description of the tract of land upon which the plant or facility is located. The term "legal description" means either a metes and bounds description, or the block and lot number of a platted subdivision which would be suitable to effectuate the transfer of title to real property.

B.3. Submit a plot plan of the property, to scale, showing the boundaries, plant bench mark (latitude-longitude), the location of all emission points of any air contaminants on the property, the distance from each emission point to the nearest boundary line, prevailing wind direction, true north direction, a scale and any other information deemed relevant by the applicant. Identify the emission points by numbers; use the same numbers for those emission points in this permit that will be assigned in the flow diagram and which will be used in present or future emissions inventory questionnaires.

VI. If Item IV.E is not checked, submit the following information:

A. Process Flow Diagram. Prepare and attach a flow diagram identifying significant individual processes and/or operations. Identify (by number) points where raw materials, chemicals, and fuels are introduced, where gaseous emissions and/or airborne particulates may be discharged including intermediate releases where finished products are obtained, and location of pollution control devices.

B. Description of Process. Prepare and attach a written description of each process and of the function of the equipment in the process. (Identify items of equipment by numbers corresponding to flow diagram numbers.) The description must be in sufficient detail to determine the general operation of the process. Particular attention must be given to explaining all stages in the process where there is or may be a discharge of any solid, liquid, or gaseous material(s) into the atmosphere. Estimate number and type of air pollution abatement devices to be used such as 1 electrostatic precipitator, 2 cyclones, 1 incinerator, 2 baghouses, etc.

VII. A copy of the application is being sent to the Regional office of TACB? ☒ Yes ☐ No

A copy of the application is being sent to local city or county Air Pollution Control Program? ☒ Yes ☐ No

VIII. I, Robert E. O'Bryan Process Engineer

(Name)

(Title)

I state that I have knowledge of the facts herein set forth and that the same are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Clean Air Act, Article 4477-5, Vernon's Texas Civil Statutes, as amended, or any of the rules and regulations of the Texas Air Control Board or any local governmental ordinance or resolution intended to carry out the Texas Clean Air Act.

DATE 9 June 1977

SIGNATURE Robert E. O'Bryan

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TABLE 4
COMBUSTION UNITS

OPERATIONAL DATA				
Number from flow diagram:		Model Number (if available): Bypass - H		
Name of device: Boiler No. 23		Manufacturer: Babcock & Wilcox		
CHARACTERISTICS OF INPUT				
Waste Material*	Chemical Composition			
	Material	Min. Value Expected lb/hr	Ave. Value Expected lb/hr	Design Maximum lb/hr
	1. Ethanol, Resid.	0	600	1200
	2. Isopropanol Resid.	0	1500	3000
	3.			
	4.			
	5.			
Gross Heating Value of Waste Material (Wet basis if applicable)	Btu/lb 12000	Air Supplied for Waste Material	Minimum SCFM (70°F & 14.7 psia) 4000	Maximum SCFM (70°F & 14.7 psia) 8000
Waste Material or Contaminated Gas	Total Flow Rate lb/hr		Inlet Temperature °F	
	Minimum Expected	Design Maximum	Minimum Expected	Design Maximum
Fuel	Chemical Composition			
	Material	Min. Value Expected lb/hr	Ave. Value Expected lb/hr	Design Maximum lb/hr
	1 #4 Fuel Oil	8,000	12,000	13,000
	2			
	3.			
	4.			
Gross Heating Value of Fuel	Btu/lb 16,500	Air Supplied for Fuel	Minimum SCFM (70°F & 14.7 psia) 78,000	Maximum SCFM (70°F & 14.7 psia) 78,000

*Describe how waste material is introduced into combustion unit on an attached sheet. Supply drawings, dimensioned and to scale to show clearly the design and operation of the unit

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TABLE 6
BOILERS AND HEATERS

Type of Device	Boiler No. 23		Manufacturer		Babcock & Wilcox	
Number from flow diagram			Model Number		Bypass - H	
CHARACTERISTICS OF INPUT						
Type Fuel	Chemical Composition (% by Weight)		Inlet Air Temp °F (after preheat)		Fuel Flow Rate (scfm* or lb/hr)	
#4 Fuel Oil	C -	87.95%	800°F		Average	Design Maximum
	H -	11.25%			12,000	13,000
	S -	.70%	Gross Heating Value of Fuel (specify units)		Total Air Supplied (scfm*)	
	ASH -	.10%	16,665 BTU/Lb		Average	Design Maximum
					79,200	79,200
HEAT TRANSFER MEDIUM						
Type Transfer Medium (Water, oil, etc.)	Temperature °F		Pressure (psia)		Flow Rate (specify units)	
	Input	Output	Input	Output	Ave.	Design Max.
Water	300	830	1100	1000	310,000 lb/hr	350,000 lb/hr
OPERATING CHARACTERISTICS						
Ave. Fire Box Temp at max. firing rate	Fire Box Volume (ft. ³). (from drawing)		Gas Velocity in Fire Box (ft/sec) at max firing rate		Residence Time in Fire Box at max firing rate (sec)	
2,200°F	9,889		130 Ft/Sec		1.6 Sec.	
STACK PARAMETERS						
Stack Diameter	Stack Height	Stack Gas Velocity (ft/sec)		Stack Gas Temp (°F)		
		(@ Ave. Fuel Flow Rate)	(@ Max. Fuel Flow Rate)			
7.9'	516' 56"	43.0	43.0	400°F		
CHARACTERISTICS OF OUTPUT						
Material	Chemical Composition of Exit Gas Released (% by Volume)					
Flue Gas	CO ₂	12.1%	N ₂	74.5%		
	H ₂ O	10.6%	O ₂	2.8%		
	SO ₂	0.036%				
Attach an explanation on how temperature, air flow rate, excess air or other operating variables are controlled.						

Also supply an assembly drawing, dimensioned and to scale, in plan elevation, and as many sections as are needed to show clearly the operation of the combustion unit. Show interior dimensions and features of the equipment necessary to calculate its performance.

* Standard Conditions: 70°F, 14.7 psia

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R.E.O'B

TABLE 4

COMBUSTION UNITS

OPERATIONAL DATA				
Number from flow diagram: <u>23</u>		Model Number (if available): <u>BY-PASS H</u>		
Name of device: <u>NO23 BOILER</u>		Manufacturer: <u>BARCOLE & WILCOX</u>		
CHARACTERISTICS OF INPUT				
Waste Material*	Chemical Composition			
	Material	Min. Value Expected lb/hr	Ave. Value Expected lb/hr	Design Maximum lb/hr
	1. <u>ETAA NOL RES</u>	<u>0</u>	<u>600</u>	<u>1200</u>
	2. <u>ISOPROPANE</u>	<u>0</u>	<u>1500</u>	<u>3000</u>
	3.			
	4.			
	5.			
Gross Heating Value of Waste Material (Wet basis if applicable)	Btu/lb <u>12,000</u>	Air Supplied for Waste Material	Minimum SCFM (70°F & 14.7 psia) <u>4000</u>	Maximum SCFM (70°F & 14.7 psia) <u>8000</u>
Waste Material or Contaminated Gas	Total Flow Rate lb/hr		Inlet Temperature °F	
	Minimum Expected	Design Maximum	Minimum Expected	Design Maximum
Fuel	Chemical Composition			
	Material	Min. Value Expected lb/hr	Ave. Value Expected lb/hr	Design Maximum lb/hr
	1. <u>NO 4 FUEL</u>	<u>8,000</u>	<u>12,000</u>	<u>13,000</u>
	2. <u>OIL</u>			
	3.			
4.				
Gross Heating Value of Fuel	Btu/lb <u>16,500</u>	Air Supplied for Fuel	Minimum SCFM (70°F & 14.7 psia) <u>78,000</u>	Maximum SCFM (70°F & 14.7 psia) <u>78,000</u>

*Describe how waste material is introduced into combustion unit on an attached sheet. Supply drawings, dimensioned and to scale to show clearly the design and operation of the unit.

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TABLE 6
BOILERS AND HEATERS

R.E.O'B

Type of Device	Boiler		Manufacturer	BARCOCK & WILCOX	
Number from flow diagram	NO 23		Model Number	34-PAGE - H	
CHARACTERISTICS OF INPUT					
Type Fuel	Chemical Composition (% by Weight)	Inlet Air Temp °F (after preheat)	Fuel Flow Rate (scfm* or lb/hr)		
#2 FUEL OIL	C- 87.95 %	800°F	Average	Design Maximum	
	11- 11.25 %		12,000	73,000	
	S- .70 %	Gross Heating Value of Fuel (specify units)	Total Air Supplied (scfm*)		
ASH- .10 %	16,665/LB	Average	Design Maximum		
			79,200	79,200	
HEAT TRANSFER MEDIUM					
Type Transfer Medium	Temperature °F		Pressure (psia)		Flow Rate (specify units)
(Water, oil, etc.)	Input	Output	Input	Output	Ave. Design Max.
WATER	300	830	1100	1000	310,000 Lb/hr 350,000 Lb/hr
OPERATING CHARACTERISTICS					
Ave. Fire Box Temp. at max. firing rate	Fire Box Volume (ft. ³). (from drawing)		Gas Velocity in Fire Box (ft/sec) at max firing rate		Residence Time in Fire Box at max firing rate (sec)
2200°F	9,889		130 FT/SEC		1.6 SEC.
STACK PARAMETERS					
Stack Diameter	Stack Height	Stack Gas Velocity (ft/sec)		Stack Gas Temp (°F)	
7.9'	56'	(@Ave. Fuel Flow Rate)	(@Max. Fuel Flow Rate)	700°F	
		43.0	43.0		
CHARACTERISTICS OF OUTPUT					
Material	Chemical Composition of Exit Gas Released (% by Volume)				
FLUE GAS	CO ₂	12.1 %	N ₂	74.5 %	
	H ₂ O	10.6 %	O ₂	2.8 %	
	SO ₂	0.036 %			
Attach an explanation on how temperature, air flow rate, excess air or other operating variables are controlled.					

Also supply an assembly drawing, dimensioned and to scale, in plan, elevation, and as many sections as are needed to show clearly the operation of the combustion unit. Show interior dimensions and features of the equipment necessary to calculate its performance.

* Standard Conditions: 70°F, 14.7 psia

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TEXAS Air Control Board

Regulation II-- Control of Air Pollution from Sulfur Compounds

Net Ground Level Concentration 131.04.01

The Texas Air Control Board is proposing to amend Rules 131.04.01.007-.009 to allow more flexibility for fuel modification and growth in Galveston, Harris, Jefferson, and Orange Counties. Industrial sources are converting from natural gas to either oil or coal due to the decline of the natural gas reserves. Rules 131.04.01.007 and .008 presently require that the net ground level concentrations for all contiguous properties be limited to 0.28 ppm and 0.32 ppm.

The levels specified in Rules 131.04.01.007 and .008 were set effective March 5, 1972, to protect these counties from deterioration of the ambient levels of sulfur dioxide beyond the secondary ambient air quality standard for sulfur dioxide. The board also adopted Regulation VI, effective March 5, 1972, requiring all new construction or modifications to obtain a permit. Regulation VI also protects the ambient levels by requiring emission controls and emission limitations from new or modified sources. The secondary standard for sulfur dioxide was issued on April 30, 1971, and included the following provisions: an annual arithmetic mean concentration of 60 micrograms per cubic meter (0.02

ppm); a maximum 24-hour concentration of 1,300 micrograms per cubic meter (0.5 ppm), not to be exceeded more than once per year, and a maximum 1-hour concentration of 1,300 micrograms per cubic meter (0.5 ppm), not to be exceeded more than once per year.

On September 14, 1973, the Environmental Protection Agency revoked the annual arithmetic mean and the maximum 24-hour portions of the standard. The secondary standard now consists of a maximum 1-hour concentration of 1,300 micrograms per cubic meter (0.5 ppm), not to be exceeded more than once per year.

The board has concluded that the 0.28 ppm and 0.32 ppm net ground level concentrations for contiguous properties is more stringent than required to protect against violations of the secondary standard. The board is proposing that the 0.28 ppm and 0.32 ppm levels be applied to single properties and 0.4 ppm net ground level concentration be applied to contiguous properties in the affected counties. The board concludes that these measures, combined with Regulation VI, will provide adequate protection of the secondary ambient air quality standards for sulfur dioxide.

Public comment on the proposed amendments is invited. A public hearing will be held on June 29, 1977, 9:30 a.m., in the auditorium of the Texas Air Control Board, located at 8520 Shoal Creek Boulevard, Austin, and on June 30, 1977, 1:30 p.m., in the auditorium of the City of Houston Health Department, located at 1211 North MacGregor, Houston, for the purpose of receiving public testimony relative to the proposed amendments. Interested persons are invited to submit data, views, and recommendations on the amendments, either orally or in writing. Written statements may be submitted prior to the hearing by mailing 15 copies of such statements to the Texas Air Control Board, 8520 Shoal Creek Boulevard, Austin, Texas 78758.

These amendments are proposed under the authority of Section 209, Article XVI, Texas Civil Statutes.

007. Net Ground Level Concentration in Galveston or Harris County. No person in Galveston or Harris County may cause, suffer, allow, or permit emissions of sulfur dioxide from a source or sources operated on a property or multiple sources operated on contiguous properties to exceed a net ground level concentration of 0.28 ppm averaged over any 30-minute period.

008. Net Ground Level Concentration in Jefferson or Orange County. No person in Jefferson or Orange County may cause, suffer, allow, or permit emissions of sulfur dioxide from a source or sources operated on a property or multiple sources operated on contiguous properties to exceed a net ground level concentration of 0.32 ppm averaged over any 30-minute period.

009. Net Ground Level Concentration. No person may cause, suffer, allow, or permit emissions of sulfur dioxide from a source or sources operated on a property or multiple sources operated on contiguous properties to exceed a net ground level concentration of 0.4 ppm averaged over any 30-minute period.

1. For all counties other than El Paso, Galveston, Harris, Jefferson, and Orange (except in El Paso County), a property or contiguous properties are exempt from the requirements of Rule 131.04.01.009 when a new or modified emission source is constructed and operated on such property or properties after the effective date of this rule providing all of the following conditions are met:

- (1) The construction and operation of the new or modified emission source meets any applicable Federal New Source Performance Standard and utilized best available control technology, with consideration to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility.
- (2) The construction and operation of the new or modified emission source does not cause or contribute to a condition such that either the primary or the secondary sulfur dioxide air quality standards are exceeded in the area.
- (3) Sources existing on an exempt property prior to the effective date of this rule are and will continue to be in compliance with Rule 131.04.01.009 or an area control plan obtained pursuant to Rule 131.04.01.007.

Issued in Austin, Texas, on May 19, 1977.

Doc No 772580- Charles R. Barden, P.E.
772582 Executive Director
Texas Air Control Board

Proposed Date of Adoption: Within 60 days of public hearing

For further information, please call (512) 451-5711, ext. 441.

Volume 2, Number 43, May 31, 1977

TEXAS REGISTER

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**** PERMIT NO: 5440 PERGR: GARCIA L GROUP: CUMB ID: 114-120-1
 ISSUED TO: UNION CARBIDE CORP. CHEMICALS TO PLASTICS
 LOCATION: CITY: TEXAS CITY
 COUNTY: GALVESTON REGION: 07 DAT: 22-22-19 6 LONG: 094-50-33 W
 HAILING INFO(PERSON, TITLE, ADDRESS): ROBERT E. O'BRYAN, PROCESS ENGR,
 PO BOX 471, TEXAS CITY, TEXAS 77590
 PRINCIPAL CO BUSINESS: Bryan
 SIC CODES: 2815 GROUP CODES: 07.28.
 SCC CODES: 1-02-004-01. - - - - -

**** PERMIT NO: 1 - NAME: FUEL CONVERSION, NO 2 POWERHOUSE-BUILDERS 21 & 22
 ID NO: NSHP: NSPS: PERMANENT: A NEW:
 PORTABLE: MODIFIED: A CL: CO: EXISTING PERMIT:

***** GUEST PERMIT: PI-1 RECD: 06-13-77 PI-2 SENT: - - - RECD: 06-13-77
 SUPP INFO COMPLETE: 06-13-77 ***REGION: SENT: 06-17-77 RECD: 07-21-77
 ISSUE: - - () DENIED: - - () EXEMPT: - - () VOID: - -
 STARTUP DATE: ESTIMATED: - - - ACTUAL: - - -
 EAT. TO GO-DAT STARTUP GRANTED: - - - TO: - - -
 REMARKS:

**** GUEST PERMIT: PI-3 RECD: - - - REGION: SENT: - - - RECD: - - -
 ISSUE: - - () DENIED: - - () VOID: - - - HOLD TIL: - - -
 REMARKS:

**** SPECIAL DATE: - - - MESSAGE:
 SPECIAL DATE: - - - MESSAGE:

**** AIR CONTAMINANT DATA: OPERATING SCHED: 24 HRS/D, 7 D/WK, 52 WK/YR
 NAME CODE EMISSION RATE *UNCONTROLLED* *REG ALLOW *PREV RATE** FLG
 NOX (E) 120. (1) (E) 240. (1) (9) () () ()
 SO2 (E) 1330. (1) (E) 1884. (1) 377. (1) () () ()
 () () () () () () () ()
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 PART (E) 100.5 (1) (E) 22. (1) 96. (1) () () ()
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EMISSION RATE UNIT CODES: 1=LB/YR 2=LB/D 3=1/1 4=PPH 5=PPM ALLOWABLE

**** ADAPTED TO EQUIPMENT:
 FIG. 104: CODE NAME AND REMARKS

COST ACFT

BE 1702

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