

**REGULATORY ASPECTS OF THE CONOCO
ABERDEEN PVC PLANT
AQAT STUDY**

Federal Water Pollution Control Act of 1972

Passage of the Federal Water Pollution Control Act of 1972, was the principle motivating force in the current effluent treatment programs. The regulatory focus of the U.S. Environmental Protection Agency (EPA) was shifted by the 1972 amendments from effluent limitations derived solely from water quality standards to single number technology-based effluent limitations on an industry-by-industry basis.

These technology-based effluent limitations provided the base level treatment to be met by all dischargers. These effluent limitations were to be achieved in several steps. By July 1, 1977, existing dischargers are required to apply the "best practicable control technology currently available" (BPT) and by July 1, 1984, existing dischargers are required to apply the "best available technology economically achievable" (BAT). By July 1, 1984, existing dischargers are required to apply "best conventional pollutant control technology" (BCT). In addition, "new source performance standards" (NSPS) are to be met if the new point source's construction commenced after promulgation of the standards.

At first it appeared EPA was going to establish effluent limitations in phases by first issuing guidelines under Section 304 of the Act followed by issuing limitations under Section 301. However, EPA combined the phased approach and issued regulations known as "Effluent Limitations Guidelines" for each regulated industry. The organic chemicals industry was one of these designated industries to be regulated.

The 1972 amendments included a timetable for issuing these effluent limitations. By 1976, EPA had not met most of the deadlines and consequently was sued by several environmental groups. The lawsuit resulted in a "Settlement Agreement" (NRDC vs. Train) requiring EPA to develop a program and adhere to a schedule in promulgating effluent limitations guidelines and standards for 65 toxic pollutants (126 priority pollutants) for 21 industrial categories. Many of the basic elements of the Settlement Agreement program were incorporated into the Clean Water Act 1977.

Plastics and Synthetics Point Source Category Effluent Limitations Guidelines

The Aberdeen PVC AQAT study was conducted between September and December of 1980. At this time, promulgated effluent limitations for PVC plants are found under 40CFR 416 Subpart A-Polyvinyl Chloride Subcategory. The only effluent characteristic for which limits are set is pH within the range of 6.0 to 9.0 standard units.

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Organic Chemicals and Plastics and Synthetic Fibers Category Effluent Limitations Guidelines

On March 21, 1983 EPA proposed the effluent limitations guidelines for BPT, BCT, BAT and NSPS for the organic chemicals and plastics and synthetic fibers (OCPSF) industry point source category in the Federal Register (48 Fed. Reg. 11828-11867).

According to the EPA Regulatory Agenda published in October 17, 1983 (48 Fed. Reg. 47883) EPA expects to promulgate these regulations by March 1984. However, according to EPA, this rulemaking may not take place before early 1985 due to the enormous response EPA received on their proposal. In addition, industry requested EPA to update their economic data base from 1976-1977 data used in the proposal to more current data.

The Conoco Aberdeen PVC Plant is considered in the Plastics Only Subcategory. The proposed effluent limitation guidelines for this subcategory are provided in Table I and calculated effluent limits are given in Table 2.

Aberdeen PVC Plant NPDES Permit

On May 1, 1974 Mississippi obtained approval from EPA to administer their own NPDES program. The current NPDES permit was issued on September 1, 1981 and will expire March 31, 1986. The effluent limits for this permit are provided in Table 3. Several unique features of this plant's permit are the seasonal limits set for BOD₅ and COD in Winter and Summer and the bioassay requirements to determine if the plant's waste stream is toxic to the receiving stream.

The primary reasons for conducting the AQAT study centered on the plant's plans to increase manufacturing capacity which would result in an increased load on the treatment system. In addition, the plant's NPDES permit had been altered by the State to include Winter and Summer limits for BOD₅ and COD. Daily average discharges for BOD₅ and COD were reduced by 18 percent and daily maximums were reduced by 8 percent for the Summer (i.e. May 1 through November 30).

Mississippi Water Quality Standards and Waste Load Allocations

The Aberdeen PVC plant discharges into the James Creek which flows into the Tombigee River. The designated use for the James Creek is fish and wildlife propagation. Water quality criteria for the creek are:

- a. Bacteria: Fecal coliform shall not exceed a geometric mean of 2000/100 ml, nor shall more than ten percent (10%) of the samples examined during any month exceed 4000/100 ml.
- b. Specific Conductance: There shall be no substances added to increase the conductivity above 1000 micromhos/cm for fresh water streams.

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TABLE 1

**PROPOSED OCPSF EFFLUENT LIMITATIONS GUIDELINES
PLASTICS ONLY SUBCATEGORY**

<u>Technology</u>	<u>Max. For Any 1 Day</u>	<u>Max. For Monthly Avg.</u>	<u>Avg. of Daily Values for 4 Consecutive Monitoring Days</u>
BCT & BCT			
BOD ₅ (mg/l)	49	22	(--)
TSS (mg/l)	117	36	(--)
pH (S.U.)	Within the range of 6.0 to 9.0 at all times.		
BAT (ug/l)			
bis (2-ethylhexyl)			
phthalate	100	(--)	50
Chromium	110	(--)	60
Vinyl Chloride	50	(--)	(--)

Source: 48 Fed. Reg. 11862 - 11863

Note: A dash (--) signifies no limitation.

TABLE 2

**CALCULATED EFFLUENT LIMITATIONS FOR THE
ABERDEEN PVC PLANT BASED ON
THE 1983 PROPOSED OCPSF
EFFLUENT LIMITATIONS GUIDELINES**

<u>Effluent Characteristics</u>	<u>BPT & BCT Limitations¹</u>		<u>BAT Limitations¹</u>	
	Max. For Any One Day lbs/day	Max. For Mon. Avg. lbs/day	Max. For Any One Day lbs/day	Avg. of Daily Values for 4 Consecutive Monitoring Days lbs/day
BOD ₅	588	264	(--) ²	(--)
TSS	1404	432	(--)	(--)
pH	Within the range of 6.0 to 9.0 at all times.		(--)	(--)
bis(2-ethylhexyl)				
phthalate	(--)	(--)	1.2	0.6
Chromium	(--)	(--)	1.32	0.72
Vinyl Chloride	(--)	(--)	0.6	(--)

Notes: 1. Calculated effluent limits based on 1000 gpm flow rate.
2. A dash (--) signifies no limitations have been set.

TABLE 3
MISSISSIPPI NPDES PERMIT
ABERDEEN PVC PLANT
(EXPIRES MARCH 31, 1986)

Effluent Characteristic ¹	001 (4/1/81-4/29/84) lbs/day (mg/l)	001 (4/30/83-3/31/86) lbs/day (mg/l)	002 (4/1/81 - 3/31/86) lbs/day (mg/l)	004 (4/1/81 - 3/31/86) lbs/day (mg/l)
	Winter ² Summer ³			
BOD ₅				
Daily Average	431 (32)	431 (32)	N/A	N/A
Daily Maximum	800 (43)	800 (43)	N/A	N/A
COD				
Daily Average	1462 (122)	1461 (122)	N/A	N/A
Daily Maximum	2713 (226)	2712 (226)	N/A	N/A
TSS				
Daily Average	674 (56)	674 (56)	1200 (100)	1200 (100)
Daily Maximum	1396 (116)	1396 (116)	2400 (200)	2400 (200)
Ammonia				
Daily Average	(--) ⁴	13.5 (1.13)	N/A	N/A
Daily Maximum	(--)	27.9 (2.33)	N/A	N/A
Bis(2-ethyl-hexyl)phthalate	(--) ⁵	(--) ⁶	N/A	N/A
Di(n-octyl)phthalate	(--) ⁵	(--) ⁶	N/A	N/A
Vinyl Chloride	(--) ⁵	(--) ⁵	N/A	N/A
Dissolve Oxygen	(--) ⁵	(--) ⁵	N/A	N/A
Temperature (Daily Maximum)	(--) ⁵	(--) ⁵	N/A	N/A
	35°C	35°C	35°C	35°C
pH	Within the range of 6.0 to 8.5			
Chromium (Total)				
Daily Average	N/A	N/A	12 (1.0)	12 (1.0)
Daily Maximum	N/A	N/A	12 (1.0)	12 (1.0)
Zinc (Total)				
Daily Average	N/A	N/A	6 (0.5)	6 (0.5)
Daily Maximum	N/A	N/A	12 (1.0)	12 (1.0)
Chlorine (Residual)				
Daily Average	N/A	N/A	2.4 (0.2)	2.4 (0.2)
Daily Maximum	N/A	N/A	2.4 (0.2)	2.4 (0.2)

1. Calculated effluent limits based on a 1000 gpm flow rate.
2. Winter is defined as December 1 through April 30.
3. Summer is defined as May 1 through November 30.
4. A dash (--) signifies no limitations have been set.
5. Quarterly grab sample.
6. Quarterly 24 hour composite.

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- c. **Dissolved Solids:** There shall be no substances added to the waters to cause the dissolved solids to exceed 750 mg/l as a monthly average value, nor exceed 150 mg/l at any time for fresh water streams.
- d. **Phenolic Compounds:** There shall be no substances added which will cause the phenolic content to exceed 0.05 mg/l (phenol).

The James Creek has a Q_{10/7} of 0.0 cfs. Due to the lack of EPA effluent limitation guidelines, with the exception of pH, the organic loading on the creek, limited by the permit, was based on the results of the waste load allocation model. The output of this model was used to set limits for BOD₅, COD, TSS, Ammonia and dissolved oxygen which are given in Table 3.

Future Permit Action

According to the Mississippi Wastewater Permit Regulations paragraph 23.(e) **Terms and Conditions of Permits: Effluent Standards and Limitations** "...The effluent limitations promulgated by ERA ... shall become immediately enforceable as if a duly promulgated regulation of the Commission." Similar language appears in Part III A.- Other Requirements of the plant's permit.

In short, this language means that once EPA promulgates the Organic Chemicals and Plastics and Synthetic Fibers Category Effluent Limitations Guidelines the plant's NPDES permit shall be modified to reflect the more stringent effluent limits. Table 4 compares the current limits to the proposed OCPSF limits which if promulgated would become the new permit limits immediately. In addition, the BAT limits have been set on phenol, acrolein, ethylbenzene, cadmium, lead and cyanide. If any of these pollutants are discharged from the plant, effluent limits will be set in the modified permit.

Once the OCPSF effluent guidelines have been promulgated a careful review of the effluent limits should be accomplished immediately. According to Hugh Wise (Organic Chemicals Branch, Effluent Guidelines Division, EPA Office of Water Regulations and Standards), the OCPSF Effluent Guidelines are expected to be promulgated in March 1985.

TABLE 4

COMPARISON OF CURRENT NPDES
PERMIT LIMITS TO THE PROPOSED
OCPSF EFFLUENT LIMITS

Effluent Characteristics	Current (4/30/83-3/31/86) NPDES Permit Limits		Proposed OCPSF ² Effluent Limits
<u>BPT & BCT Limitations¹</u>			
BOD ₅	Winter	Summer	
Daily Average	431 (32)	357 (26.5)	264
Daily Maximum	800 (43)	744 (40)	588
TSS	001	002 & 003	
Daily Average	674	(100)	432 (36)
Daily Maximum	1396	(200)	1404 (117)
pH	6.0 to 8.5		6.0 to 9.0
<u>BAT Limitations¹</u>			
Bis(2-ethyl-hexyl)phthalate			
Daily Average	Report Quarterly		0.6
Daily Maximum	Report Quarterly		1.2
Vinyl Chloride			
Daily Average	Report Quarterly		(--)
Daily Maximum	Report Quarterly		0.6
Chromium, Total			
Daily Average	Report Quarterly		0.72
Daily Maximum	Report Quarterly		1.32

1. Limits are given in lbs/day (mg/l).

2. Calculated effluent limits based on 1000 gpm flow rate.

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