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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

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OHIO EPA
DSW-WQ
REPLY TO THE ATTENTION OF:

R-19J

Lisa Morris, Chief
Division of Surface Water
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216 - 1049

Dear Ms. Morris:

The United States Environmental Protection Agency has reviewed the application submitted by the LTV Steel Corporation for their Cleveland Works requesting variances for ammonia-N from best available technology economically achievable requirements of the Clean Water Act pursuant to Section 301(g). We propose to grant the variances to the LTV Steel Corporation with the terms, conditions and limitations of the enclosed evaluation. Please proceed with the public notice of this proposed decision and the draft National Pollutant Discharge Elimination System permit for this facility. We will make our final decision after we have reviewed any additional information or comments provided during the public notice period.

Sincerely yours,

David A. Ullrich
Acting Regional Administrator

Enclosure

cc: Paul Novak, OEPA

LTV Steel - Cleveland Works
Section 301(g) Variances for Ammonia-N
Ohio EPA Permit No. 3ID00003*LD
NPDES No. OH0000957

Introduction

Following is a review of the Section 301(g) variances for ammonia-N proposed by Ohio EPA for two blast furnace operations located at the LTV Steel - Cleveland Works. The review follows EPA's pollutant-specific Section 301(g) guidance document for ammonia-N.¹

LTV Steel's predecessors Republic Steel and Jones and Laughlin Steel applied for Section 301(g) variances for ammonia-N and phenols (4AAP) from Best Available Technology effluent limitations in 1983 set out in 40 CFR Part 420, the effluent limitations guidelines and standards for the iron and steel industry.^{2 3 4 5 6} Ohio EPA has recommended that the variances be approved, at least on a conditional basis. NPDES permits issued subsequently to LTV Steel have contained the respective BAT effluent limitations for ammonia-N and phenols (4AAP); however, the Director of the Ohio Environmental Protection Agency (Ohio

¹ *Pollutant-Specific Section 301(g) Guidance Document, Ammonia*; Office of Water Enforcement and Permits, U.S. Environmental Protection Agency, Washington, D.C.; September 1985.

² Letter dated February 17, 1983, to (Regional Administrator, U.S. Environmental Protection Agency, Region V, Chicago, IL), from (William L. West, Director, Environmental Control, Republic Steel, Cleveland, OH).

³ Letter dated March 31, 1983, to (Irvin J. Dzikowski, Chief Permits Section, U.S. Environmental Protection Agency, Region V, Chicago, IL), from (L.D. Wisniewski, Asst. Director - Water, Republic Steel, Cleveland, OH).

⁴ Letter dated April 19, 1983, to (Irvin J. Dzikowski, Chief Permits Section, U.S. Environmental Protection Agency, Region V, Chicago, IL), from (L.D. Wisniewski, Asst. Director - Water, Republic Steel, Cleveland, OH).

⁵ Letter dated June 9, 1983, to (Regional Administrator, U.S. Environmental Protection Agency, Region V, Chicago, IL), from (William L. West, Director, Environmental Control, Republic Steel, Cleveland, OH).

⁶ Letter dated February 18, 1993, to (Dennis Lee, Division of Industrial Wastewater, Ohio Environmental Protection Agency, Twinsburg, OH), from (David H. Miller, General Manager - Environmental Control, Jones & Laughlin Steel Corporation, Pittsburgh, PA).

EPA) issued to LTV Steel an administrative order on December 31, 1990, in which Ohio EPA required compliance with the requested Section 301(g) variance proposed modified effluent limitations (PMELs).⁷ A similar approach was taken by Ohio EPA in 1994 when the next NPDES permit was issued. Subsequently, the Ohio EPA determined that LTV Steel has achieved consistently the BAT effluent limitations for phenols (4AAP) and is not recommended approval of any variances for phenols (4AAP).⁸ Consequently, this review focuses on the Section 301(g) variances for ammonia-N recommended for approval by Ohio EPA.

Source Information

LTV Steel operates an integrated steel mill without cokemaking operations at its Cleveland Works with process wastewater, non-contact cooling water and storm water discharges to the Cuyahoga River. Blast furnace operations are conducted separately on the east and west sides of the Cuyahoga River. Currently, two blast furnaces are operable on the east side (C5 & C6 blast furnaces), and one on the west side (C1 furnace), as follows:

	<u>C1 Blast Furnace</u>		<u>C5 & C6 Blast Furnaces</u>	
Internal outfall and flow	621:	0.07 mgd	604:	0.17 mgd
External outfall and flow	027:	13.3 mgd	005:	48.7 mgd

Each set of furnaces is equipped with a dedicated gas wash water (process water) treatment and recycle system. Discharges from Outfalls 027 and 005 comprise principally non-contact cooling water. Discharges from Outfalls 621 and 604 are low volume, process wastewater discharges from the respective blast furnace gas cleaning and cooling water treatment and recycle systems. Outfall 027 discharges to the Cuyahoga River at river mile (RM) 5.05; Outfall 005 at RM 5.39.

Ammonia-N is present in the gas wash water as a result of coke charged to the furnaces, which may contain residual amounts of ammonia, and possibly from complex chemical reactions in the furnaces. 40 CFR Part 420 sets out BPT and BAT effluent limitations

⁷ Director's Final Findings and Orders in the matter of LTV Steel Company, Incorporated, Ohio Environmental Protection Agency, Columbus, OH, December 31, 1990.

⁸ Letter of April 2, 2000, to (Rebecca Harvey, U.S. Environmental Protection Agency, Chicago, IL), from (Paul G. Novak, P.E., Manager, Water Resource Management Section, Ohio Environmental Protection Agency, Columbus, OH).

guidelines for ammonia-N applicable to blast furnace operations (see §420.32(a) and §420.33(a), respectively).

Receiving Water Information

The lower Cuyahoga River at Cleveland has been classified for the following designated water uses in Ohio water quality standards (see OAC 3745-1: pages 26-01 to 26-08):

<u>River Reach</u>	<u>Use Classification</u>
Upstream of RM 5.6	Aquatic life - warmwater habitat Industrial water supply Agricultural water supply Primary contact recreation
<u>River Reach</u>	<u>Use Classification</u>
RM 5.6 to 0.0	Aquatic life - warmwater habitat February to May, or when stream flow is > 703 cfs at USGS gage located in Independence Limited resource water June to January Fish passage January to May, when stream flow is > 703 cfs at USGS gage located in Independence Primary contact recreation Industrial water supply

Ohio EPA has completed a wasteload allocation for the lower Cuyahoga River and has developed water quality-based effluent limitations (WQBELs) for major dischargers including the Northeast Ohio Regional Sewer District Southerly Plant and LTV Steel. The waste load allocation has been codified in the water quality standards for the Cuyahoga River at OAC 3745-1-26, Table 26-1. Table 26-1 includes the Section 301(g) proposed modified effluent limitations (PMELs) for ammonia-N for LTV Steel.

LTV Steel Section 301(g) Variance Requests

Table 1 presents comparisons of applicable BAT effluent limitations for ammonia-N for each blast furnace operation with corresponding BPT effluent limitations; Ohio EPA waste load allocations; the 301(g) variance PMELs recommended for approval by Ohio EPA.

Evaluation of Section 301(g) Criteria

Following is a review of the recommended PMELs in context of decision criteria set out by the EPA Office of Water Permits and Enforcement (OWEP) in 1985. These criteria were developed and based on the first steel industry Section 301(g) variance request approved for Weirton Steel following promulgation of 40 CFR Part 420 in 1982 and 1984. There are no NPDES permit regulations for review and processing Section 301(g) variances. Absent regulations, the criteria set out by OWEP were used as guidance.

Threshold Decisions

1. Was the initial request filed in a timely manner?

40 CFR §122.21 requires that the initial request for a Section 301(g) variance must be made within 270 days of promulgation of the underlying effluent limitations guidelines regulation; or, a notice of intent was to have been filed by September 1978. The applicable effluent limitations guidelines regulation (40 CFR Part 420) was promulgated initially in May 1982 and amended in May 1984. In addition to the 1983 notifications noted in footnotes 2 to 6, a notice of intent was also filed during September 1978.⁹ These documents demonstrate the Section 301(g) notice and filing requirements were met.

2. Is the pollutant for which the variance has been sought a non-conventional pollutant?

Ammonia-N is a non-conventional pollutant eligible for Section 301(g) variances. Ammonia-N is neither a Section 307(a) toxic pollutant or a Section 304(a)(4) conventional pollutant. Ammonia-N is not on the list of 65 toxic pollutants or pollutant classes designated pursuant to Section 307(a)(1) of the Clean Water Act at 40 CFR §401.15, nor is it on the list of conventional pollutants designated at 40 CFR §401.16 pursuant Section 304(a)(4) of the Act.

3. Do the proposed modified effluent limitations (PMELs) meet at a minimum the BPT limits and state water quality standards?

Reference is made to Table 1 which shows the PMELs are more stringent than the BPT limits and WQBELs derived by Ohio EPA for the outfalls in question.

⁹ Letter dated September 21, 1978, to (Regional Administrator, U.S. Environmental Protection Agency, Region V, Chicago, IL), from (D.H. Clark, Vice President Operations, Republic Steel, Cleveland, OH).

Analyses of Potential Impacts of PMELs

Three potential problem areas are identified in the OWEP guidance: pH and temperature; human health; and, synergism. Ohio EPA dealt expressly with pH and temperature when it developed the WQBELs on a seasonal basis. There is no information to suggest that there would be human health or synergism (increased toxicity) impacts associated with the proposed PMELs. The Cuyahoga River is not designated for public water supply uses and the proposed PMELs are well below the Ohio EPA WQBELs and generally well below the prior PMELs authorized by Ohio EPA.

1. Additional requirements on other point or non-point sources

This issue is addressed by the Ohio EPA wasteload allocation for the lower Cuyahoga River. The proposed variances do not result in additional requirements on other discharges.

2. Impacts to public water supplies

Public water supplies in Ohio are protected by drinking water quality standards applicable at the point of water withdrawal. As is the case in most states, there are no applicable drinking water standards for ammonia-N in Ohio. The nearest public water supply is located in Lake Erie, approximately five miles from the mouth of the Cuyahoga River and more than ten miles from the respective outfalls. A potential impact of the PMELs is formation of Nitrite and Nitrate-N from nitrification of ammonia-N. Finished drinking water quality data published recently by the City of Cleveland Division of Water show Nitrite and Nitrate-N concentrations are well below the primary drinking water standard (Maximum Contaminant Level, MCL) of 10 mg/L.¹⁰ For 1999, the Cleveland Water Department reported Nitrate-N concentrations ranging from 0.12 to 0.77 mg/L. Because these data were collected when discharges from LTV Steel were in the range of the PMELs, adverse impacts on the nearest public water supply cannot reasonably be anticipated.

3. Impact to Recreational Activities

The Ohio water quality standards specify There are no impacts from the proposed PMELs on recreational activities that can reasonably be anticipated.

¹⁰ 1999 City of Cleveland Water Quality Report, City of Cleveland, Division of Water (www.clevelandwater.com/1999reporthome.htm).

4. Impacts on Fish, Shellfish and Wildlife

These issues were addressed recently by Ohio EPA when it established designated uses and water quality standards for the lower Cuyahoga River and developed the WQBELs shown in Table 1.¹¹ The designated uses provide for seasonal warm water fisheries and fish passage and limited resource water for the balance of the year (see above), as well as primary contact recreation.

5. Impact to the Environment or Human Health Due to Acute and Chronic Toxicity, Persistency, Bioaccumulation or Synergistic Propensities

The 1985 EPA Office of Water Enforcement and Permits guidance states that state water quality standards can be used as a basis for the Section 301(g) variance provided the standards are designed to provide protection for aquatic life and human health concerns. Specifically, the guidance cites protection of human health through designation of recreational and drinking water uses and direct protection of aquatic life. The Ohio water quality standards meet these criteria. Recreational and drinking water use designations are specified; and, chronic and acute toxicity to aquatic life are addressed specifically by the water quality standards for specific pollutants. Accordingly, comparison of the PMELs for ammonia-N with WQBELs derived by the Ohio EPA for LTV Steel Outfalls 005 and 027 is an appropriate means to evaluate the requested variance.

Because the PMELs are well below the WQBELs established by the Ohio EPA wasteload allocation (see Table 1 attached), adverse impacts associated with acute or chronic toxicity in the Cuyahoga River cannot reasonably be anticipated.

Ammonia-n is not persistent in the aquatic environment and does not bioaccumulate in aquatic organisms (see footnote 1, 1985 EPA OWEP guidance, page 12). Consequently, adverse impacts associated with persistency or bioaccumulation cannot reasonably be anticipated.

Data provided by the applicant (footnote 3) and in subsequent NPDES permit applications show a general absence of toxic organic pollutants and relatively low levels (low ug/L range) of selected toxic metals in discharges from Outfalls 005 and 027. There is no information to suggest ammonia-N in combination with any of the pollutants at the levels listed in the NPDES permit application will result in synergistic propensities (greater toxicity of two pollutants in combination than the toxicity of each pollutant added together).

¹¹ Ohio Water Quality Standards for the Cuyahoga River, OAC 3745-1-26,

LTV Steel chlorinates intake water withdrawn from the Cuyahoga River for process and non-contact cooling uses for control of zebra mussels and bio-fouling. The NPDES permit requires dechlorination of discharges from Outfalls 005 and 027 and establishes effluent limits for residual chlorine of 0.018 mg/L monthly average and 0.022 mg/L daily maximum. The process water discharges containing ammonia-N from Outfalls 604 and 621 come into contact with non-contact cooling water for short periods of time before discharge to the Cuyahoga River. There is a potential to form chloramines from reaction of chlorine that may be remaining in the cooling water and ammonia-N contained in the blast furnace process wastewaters discharged from Outfalls 604 and 621. Chloramines are more persistent and can exhibit greater toxicity to aquatic life than ammonia-N.

Ohio EPA determined that the potential for discharges from Outfalls 005 and 027 to cause or contribute to exceedances of ambient water quality standards did not merit imposition of whole effluent toxicity (WET) effluent limitations. These determinations were based on available WET monitoring data for Outfalls 005 and 027. Ohio EPA has addressed the potential for effluent toxicity from Outfalls 005 and 027 in the NPDES permit by requiring WET monitoring on a quarterly basis. The NPDES permit provides for follow-up toxicity reduction evaluations should effluent toxicity be determined. Ohio EPA has thus addressed the potential for impacts on the environment associated with acute or chronic toxicity, persistency and synergistic propensities.

Conclusion

The variances recommended for approval by Ohio EPA for ammonia-N at LTV Steel Outfalls 604/005 and 621/027 meet Section 301(g) criteria as set out in the 1995 EPA OWEF guidance.

Table 1

LTV Steel - Cleveland Works
Section 301(g) Variance Effluent Limitation Comparison
Ammonia-N

(Effluent limitations in kg/day)

Effluent Limitations	C1 Blast Furnace Outfalls 621, 027		C5 & C6 Blast Furnaces Outfalls 604, 005	
	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum
BAT	9.61	28.8	24.7	74.0
BPT	177	530	454	1,360
Ohio EPA WQBELs				
Summer	291	1,680	1,086	6,371
Winter	291	1,123	1,086	4,217
PMELs				
Section 301(g)				
variance	17.6	28.8	62.4	85.6
Summer	50.0	68.5	81.6	211
Winter				