AR-7

OhioEPA
State of Ohio Environmental Protection Agency

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April 2, 2000

Rebecca Harvey
77 West Jackson Boulevard
Chicago, IL 60604

Dear Ms. Harvey

The Ohio EPA is updating our analysis of the 301(g) variance request for the LTV Steel Company Cleveland Works (NPDES # OH0000957). LTV has renewed its request for alternative limits for ammonia-nitrogen and total phenolics under Section 301(g) of the Clean Water Act. Their request is attached. The current OEPA recommendation is that the variance should be approved for ammonia, with effluent limits as listed below. These limits are protective of water quality standards in the Cuyahoga River. We are not including variance limits for total phenolics in this new set of limits because LTV appears able to meet BAT limits for this parameter.

Recommended Limits for ammonia (kg/day):

Outfall 604:

Season	30-day	Daily
summer	62.4	85.56
winter	81.6	210.8

Outfall 621:

Season	30-day	Daily
summer	17.64	28.8
winter	49.98	68.52

Our analysis of the current variance, considering BPT, BAT, wasteload allocation and current treatment plant performance is attached. If you have any questions about the limitations, please contact Eric Nygaard at (614) 644-2024.

Sincerely,

Paul G. Novak, P.E., Manager
Water Resource Management Section
Division of Surface Water

PGN/EN

cc: Eric Nygaard, DSW
Sandy Cappotto, DSW/NEDO

Attachment 1: LTV Steel - 301(g) variance review

Section 301(g) of the Clean Water Act allows the USEPA Adminstrator, with the concurrence of the State, to modify Best Available Technology (BAT) limits for certain pollutants provided that the discharge can comply with Best Practicable Control Technology (BPT) limits and any applicable water quality-based effluent limits (WQBELs). In addition, the granting of a 301(g) variance can not result in any additional controls on other point or non-point source. Section 301(g) does not mention any specific cost or achievability tests for granting the variance, and USEPA has never promulgated any regulations for the review of these variances. The pollutants that are listed under this variance provision include ammonia-nitrogen and total phenolics.

LTV Steel has had a 301(g) variance request pending with USEPA for several cycles of this permit. For each of the past permits, Ohio EPA has recommended at least a conditional approval of this variance request, and has written Director's Final Findings & Orders (DFFOs) that contain effluent limits based on the variance request. Ohio EPA expected LTV to comply with these limitations instead of those listed in the NPDES permit. The current DFFOs were issued concurrently with the 1994 NPDES permit.

Ohio EPA has agreed to the DFFOs in the past because it has been uncertain that requiring compliance with BAT would lead to any significant improvement in the Cuyahoga River. Another consideration is that the Cuyahoga ship channel did not have any applicable use designations prior to the early 1990s, making an evaluation of water quality standards (WQS) and use attainment impossible.

As part of this permit renewal, Ohio EPA again drafted DFFOs that contain alternate limits associated with this variance. It now appears that USEPA will make a determination on the variance, which will allow limits to be incorporated into the NPDES permit.

Some of the variance conditions are being changed from the 1994 DFFOs, due to either blast furnace shutdowns or treatment process improvements that have occurred since then. The new variance limits drafted by Ohio EPA maintain the applicable WQS for ammonia for all of the designated uses of the Cuyahoga River.

A summary of the analysis is on the attached spreadsheet. Ohio EPA is recommending that the variance be approved for ammonia, with certain changes. Changes to the limits are needed due to treatment/operational improvements at the facility, and the shutdown of one of the west side blast furnaces. The draft variance limits allow significantly less ammonia to be discharged than the 1994 DFFOs. The changes for the west side blast furnace (outfall 621/027) represent a 95% reduction in the allowable ammonia discharge.

Ohio EPA is not recommending approval of the phenolics variance because it appears that LTV is complying with BAT limitations, and has been since at least 1995. An analysis of LTV monthly operating report data shows that the treatment levels vary seasonally at the outfalls that are the main sources of ammonia, 604 and 621. Thus the recommendations for ammonia have different limits for summer and winter periods.

Limitations for outfall 604/005:

The current limitations for ammonia in the 1994 DFFOs are based on past production and treatment plant performance for the C5/C6 blast furnace discharges. These limits easily meet BPT, and the most recent wasteload allocation (WLA) indicates that they also allow WQS to be met in the Cuyahoga River. For example, the draft variance limits contain an average summer limit of 62.4 kg/day, where the existing DFFOs allow 81.6 kg/day, and the WLA is 1086 kg/day. A more complete limits comparison is in the attached 301(g) analysis. These recommendations revise the limits for the summer, and reduce slightly the winter maximum limit, based on the performance of the 604 discharge during 1995-98. The recommended limits are based on a Projected Effluent Quality (PEQ) analysis, with a 20% factor added to account for analytical and production variability. The data indicates that LTV will be able to comply with these limits close to 100% of the time.

The WLA value provided is for the 005 effluent; however, data from the blast furnace monitoring study, done by LTV under a Section 308 data request from USEPA, indicates that outfall 604 is the only significant source of ammonia in the effluent. The attached spreadsheet shows that the ammonia discharged at outfall 005 is usually less than the sum of the intake and 604 loadings, indicating that there may be some reduction of ammonia in the non-contact cooling water portion of outfall 005.

PEQ values were established using Method A from the Ohio EPA guidance, because it provided the best fit for the observed data. All statistical analyses were done on daily load values.

Note that the winter PEQaverage values exceed the average limitation in the 1994 DFFOs. It is not clear from these statistics whether or not there are any exceedances of the DFFO limits actually occurring. Ohio EPA has kept the average limit from the 1994 DFFOs for the winter period. LTV has not asked for a load increase in their NPDES application.

Limitations for outfall 621/027:

The limits for this outfall in the 1994 DFFOs are based on 2 blast furnaces discharging process wastewater to the 621 treatment system. Since 1994, the C3 blast furnace has been shut down, which is reflected in the BAT and BPT limit calculations in their permit. Ohio EPA did an analysis of effluent data to develop PEQ values and add the 20% variability factor, similar to the analysis for outfall 604/005. The recommended variance limits are based on this analysis, with the exception of the summer maximum ammonia limit. BAT was applied for the summer maximum ammonia limits because the effluent performance related limit was more stringent than BAT. The proposed limits will easily meet WQS and will be a significant reduction compared with the 1994 DFFO limits.

For example, the draft variance limits contain a 30-day average ammonia limit of 17.6 kg/day, compared to 307 kg/day in the 1994 DFFOs and a wasteload allocation of 291 kg/day. The attached 301(g) variance review contains a more complete analysis.

The WLA for outfall 027 is clearly met by the draft variance limits. Even though outfall 027 has sources of ammonia other than 621 (see the blast furnace study data), the WLA would be maintained even with 621 discharging at the variance level and the maximum contribution from other sources occurring at the same time.

PEQ values for the summer season were based on Method B of the modeling guidance. PEQs for the winter period were based on Method A.

Table 33a - 301(g) variance review for LTV Steel - Cleveland Works

all values are kg/day

Outfall 604	BAT	BPT	WLA (summer)	WLA (winter)	PEQ (summer)	PEQ (winter)	Current F&Os w/ 301(g) conditions	Draft Limits w/ new 301(g) conditions	
Ammonia-N								(summer)	(winter)
30-day	24.66	453	1086	1086	52	128.3	81.6	62.4	81.6
Daily	73.97	1360	6371	4217	71.3	175.7	244.9	85.56	210.84
Phenolics									
30-day	0.246	17.7	NA	NA	0.0146	0.0146	0.3	0.246	0.246
Daily	0.493	52.9	NA	NA	0.0195	0.0195	0.6	0.493	0.493

Outfall 621	BAT	BPT	WLA (summer)	WLA (winter)	PEQ (summer)	PEQ (winter)	Current F&Os w/ 301(g) conditions	Draft Limits w/ new 301(g) conditions	
Ammonia-N								(summer)	(winter)
30-day	9.61	177	291	291	14.7	41.65	307	17.64	49.98
Daily	28.8	530	1680	1123	23.1	57.1	726	28.8	68.52
Phenolics									
30-day	0.096	6.91	NA	NA	0.0031	0.0031	4.53	0.096	0.096
Daily	0.192	20.6	NA	NA	0.0044	0.0044	9.53	0.192	0.192

PEQ Summary:1995-98 No outliers in dataset

Outfall 604	**# obs.**	**# >detec.**	**Max. (summer)**	**Max. (winter)**	**PEQ (summer)**	**PEQ (winter)**	
							Summer effluent data is June-September
Ammonia-N	59s, 54w	59s, 54w	71.3	175.7			Winter effluent data is December-February
30-day					52.049	71.3	
Daily					128.261	175.7	
Phenolics	41	9	0.013	0.013			
30-day					0.0146	0.0146	
Daily					0.0195	0.0195	

Outfall 621	**# obs.**	**# >detec.**	**Max. (summer)**	**Max. (winter)**	**PEQ (summer)**	**PEQ (winter)**
Ammonia-N	61s, 46w	61s, 46w	21.42	57.06		
30-day					14.7	23.1
Daily					41.6538	57.06
Phenolics	45	12	0.004	0.004		
30-day					0.0146	0.0146
Daily					0.0195	0.0195

Table 33b - LTV Steel Blast Furnace Area

Ammonia Load Balance

DATE	801.000 CONC	801.000 LOAD	604.000 CONC	604 FLOW	604.000 LOAD	TOTAL LOAD	OUT 005 CONC	OUT 005 FLOW	OUT 005 LOAD	LOAD ADDED
15-May	1.200	226.464	58.300	0.160	35.306	261.771	0.860	49.860	162.299	-99.471
16-May	1.100	207.301	56.900	0.200	43.073	250.374	0.810	49.790	152.649	-97.725
21-May	0.930	175.228	73.300	0.220	61.037	236.265	1.160	49.780	218.564	-17.701
22-May	1.020	191.722	60.900	0.220	50.711	242.434	0.830	49.660	156.009	-86.424
28-May	0.770	145.198	55.200	0.180	37.608	182.806	0.710	49.820	133.884	-48.922
29-May	0.720	137.813	54.900	0.150	31.169	168.983	0.680	50.570	130.157	-38.826
4-June	0.790	154.860	0.480	0.270	0.491	155.350	0.570	51.790	111.734	-43.616
5-June	0.850	165.914	50.190	0.260	49.392	215.306	0.820	51.570	160.058	-55.248
11-June	0.960	188.947	52.480	0.250	49.659	238.606	0.850	52.000	167.297	-71.309
12-June	0.660	130.601	65.650	0.230	57.152	187.752	0.870	52.280	172.155	-15.597
18-June	0.610	122.669	30.900	0.260	30.409	153.078	0.470	53.130	94.516	-58.562
20-June	1.100	218.542	50.000	0.240	45.420	263.962	0.710	52.490	141.059	-122.903
25-June	0.360	72.109	37.400	0.310	43.883	115.992	0.530	52.920	106.160	-9.832
26-June	0.700	142.013	22.400	0.340	28.827	170.840	0.460	53.600	93.323	-77.517
2-July	0.410	83.024	22.300	0.330	27.854	110.878	0.670	53.500	135.673	24.796
3-July	0.460	93.671	24.300	0.340	31.272	124.943	0.340	53.800	69.235	-55.708
9-July	0.350	69.735	36.400	0.560	77.153	146.888	0.680	52.640	135.485	-11.403
10-July	0.200	39.515	33.300	0.480	60.499	100.015	0.700	52.200	138.304	38.289
16-July	0.430	86.211	34.800	0.420	55.322	141.533	0.530	52.970	106.260	-35.272
17-July	0.400	80.378	26.800	0.370	37.532	117.910	0.520	53.090	104.492	-13.419
23-July	0.810	162.429	20.950	0.630	49.956	212.385	0.630	52.980	126.333	-86.052
24-July	0.400	80.181	16.500	0.460	28.728	108.910	0.350	52.960	70.159	-38.751
30-July	0.260	51.232	35.000	0.410	54.315	105.547	0.530	52.060	104.435	-1.112
31-July	0.270	53.049	34.900	0.430	56.801	109.851	0.420	51.910	82.521	-27.330
02-Aug	0.280	54.908	22.700	0.300	25.776	80.684	0.390	51.810	76.479	-4.205
06-Aug	0.440	86.001	32.200	0.080	9.750	95.751	0.730	51.640	142.684	46.932
07-Aug	0.470	91.118	33.000	0.240	29.977	121.095	0.430	51.220	83.363	-37.732
13-Aug	0.800	155.397	41.300	0.420	65.655	221.052	1.010	51.320	196.189	-24.863

Table 33c - LTV Steel Blast Furnace Area

Ammonia Load Balance

DATE	807.000 CONC	807.000 LOAD	621.000 CONC	621 FLOW	621.000 LOAD	TOTAL LOAD	OUT 027 CONC	OUT 027 FLOW	OUT 027 LOAD	LOAD ADDED
15-May	0.630	39.202	34.500	0.061	7.966	47.168	1.100	16.440	68.448	21.280
21-May	0.490	31.937	28.100	0.067	7.126	39.063	0.900	17.220	58.660	19.597
29-May	0.410	26.211	19.500	0.119	8.783	34.994	0.950	16.890	60.732	25.738
5-June	0.500	31.624	9.650	0.110	4.018	35.641	0.430	16.710	27.196	-8.445
12-June	0.490	34.589	18.570	0.054	3.796	38.385	0.820	18.650	57.884	19.499
19-June	0.370	25.936	28.000	0.035	3.709	29.646	0.560	18.520	39.255	9.609
26-June	0.220	16.746	11.800	0.045	2.010	18.755	0.400	20.110	30.447	11.691
3-July	0.580	27.397	15.500	0.027	1.584	28.981	0.610	12.480	28.814	-0.167
10-July	0.350	16.321	28.200	0.020	2.135	18.456	0.520	12.320	24.248	5.793
17-July	0.340	15.803	19.500	0.053	3.912	19.715	0.400	12.280	18.592	-1.123
06-Aug	0.230	10.690	14.500	0.006	0.329	11.020	0.260	12.280	12.085	1.065
13-Aug	0.400	51.612	44.200	0.039	6.525	58.137	0.720	34.090	92.902	34.765