

July 8, 2004

Mr. James Alexander  
U.S. Steel – Midwest Plant  
U.S. Route 12  
Portage, IN 46368

Dear Mr. Alexander;

Re: 127-18670  
Minor Modification to  
CP 127-8136-00009

U.S. Steel - Midwest Plant located at U.S. Route 12, Portage, Indiana was issued a construction permit CP127-8136-00009 on June 9, 1997 for the operation of a steel finishing facility. On March 15, 2004 a request was received to modify the entry end of the Number 1 Continuous Pickle Line (CPL) at this plant. Pursuant to IC13-15-7-1, this condition in the construction permit CP127-8136-00009 is hereby modified as follows:

Modification of Entry End of Number 1 Continuous Pickle Line so it can accommodate larger coils.

All other conditions of the permit shall remain unchanged and in effect. Please attach a copy of this amendment and the following revised permit pages to the front of the original permit.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter, please contact Walter Habeeb, OAQ, 100 North Senate Avenue, P.O. Box 6015, Indianapolis, Indiana, 46206-6015, or call at (800) 451-6027, press 0 and ask for Walter Habeeb or dial (317) 232-8422.

Sincerely,

Original signed by Paul Dubenetzky  
Paul Dubenetzky, Chief  
Permits Branch  
Office of Air Quality

WVH

cc: File - Porter County  
Air Compliance – Rick Massoels  
Northwest Regional Office  
Compliance Data Section  
Part 70 Application File - T-127-7403-00009

**PART 70 MINOR SOURCE MODIFICATION  
OFFICE OF AIR QUALITY**

**U.S. Steel – Midwest Plant  
U.S. Route 12  
Portage, IN 46368**

(herein known as the Permittee) is hereby authorized to construct and operate subject to the conditions contained herein, the emission units described in Section A (Source Summary) of this approval.

This approval is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

Construction Permit No.: 127-8136-00009	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: June 9, 1997

Minor Source Modification No. 127-18670-00009	Pages Affected: 8, 36, 37
Issued by: Original signed by Paul Dubenetzky Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: July 8, 2004

- (7) One (1) roll rig with a rated capacity of 3.0 MMBtu per hour fired by natural gas and exhausting through a roof monitor
- (8) Drying oven fired by natural gas and rated at 7.8 MMBtu per hour exhausting through roof monitor
- (c) Continuous Anneal Line (installed in 1961), with a capacity rate of 46.2 net tons per hour and 77.8 MMBtu/hr, consisting of the following:
  - (1) Alkaline Electrolytic Cleaning Section (I017) with a fume washer and exhausting out stack S004
  - (2) Annealing Furnace (U007) fired by natural gas and exhausting through a roof vent
  - (3) Two (2) 1.0 MMBtu per hour natural gas-fired strip dryers
- (d) Batch Annealing Furnaces (Installed in 1961), with a total capacity rate of 125.6 tons of steel coils per hour and 149 MMBtu/hr heat input, consisting of the following:

Twenty (20) Multi stack Batch Annealing Furnaces with fifty (50) Multi stack bases (U008), fired by natural gas and exhausting through three (3) wall-mounted building vents
- (e) Pickle Line (Installed in 1961) with a capacity of 222.0 tons per hour of steel (entry end of no. 1 CPL modified in 2004 to handle larger diameter coils) consisting of the following:
  - (1) Four (4) Acid pickling tubs and one (1) rinse tub, (U010), with emissions controlled by a packed-bed scrubber at a design capacity of 58,000 cfm, designated as control device (C010), with emissions exhausting through stack S012
  - (2) One (1) 30,000 gallon spent pickle liquor (SPL) tank, with emissions controlled by a packed-bed scrubber, designated as control device (C010), with emission exhausting through stack S012
  - (3) Four (4) 10,000 gallon offline pickle solution storage tanks with uncontrolled fugitive emissions exhausting through vent F020
- (f) 80" Cold Reduction Mill (Tandem Mill) (Installed in 1970), with a capacity rate of 131.3 net tons steel per hour, consisting of the following:

80" Tandem Mill (U011) with four (4) Oil mist eliminators (C011), exhausting through roof vents S010a and S010b
- (g) 52" Cold Reduction Mill (Tandem Mill) (Installed in 1961), with a capacity rate of 73.6 net tons of steel per hour, consisting of the following:

52" Tandem Mill (U012) with two (2) Oil mist eliminators (C012), exhausting through stack U011a and stack U011b

**SECTION D.5**

**FACILITY OPERATON CONDITIONS**

**Facility Description [326 IAC 2-7-5(15)]:**

- (e) Pickle Line (Installed in 1961) with a capacity of 222.0 tons per hour of steel (entry end of no.1 CPL modified in 2004 to handle larger diameter coils) consisting of the following:
- (1) Four (4) Acid pickling tubs and one (1) rinse tubs, (U010), with emissions controlled by a packed-bed scrubber at a design capacity of 58,000 cfm, designated as control device (C010), with emissions exhausting through stack S012.
  - (2) One (1) 30,000 gallon spent pickle liquor (SPL) tank, with emissions controlled by a packed-bed scrubber, designated as control device (C010), with emission exhausting through stack S012.
  - (3) Four (4) 10,000 gallon offline pickle solution storage tanks with uncontrolled fugitive emissions exhausting through vent F020.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

**Emission Limitations and Standards [326 IAC 2-7-5(1)]**

- D.5.1 General Provisions Relating to HAPs [326 IAC 20-1-1][40 CFR Part 63, Subpart A]  
The provisions of 40 CFR Part 63, Subpart A - General Provisions, which are incorporated as 326 IAC 20-1-1, apply to the emission units described in this section except when otherwise specified in 40 CFR Part 63, Subpart CCC.
- D.5.2 National Emission Standards for Hazardous Air Pollutants for Steel Pickling - HCl Process Facilities and Hydrochloric Acid Regeneration Plants [40 CFR Part 63, Subpart CCC] Pursuant to 40 CFR Part 63, Subpart CCC, the pickle line shall comply with the following requirements:
- The Permittee shall not cause or allow to be discharged into the atmosphere from the affected pickling line:
- (a) Any gases that contain HCl in a concentration in excess of 18 ppmv; or
  - (b) HCl at a mass emission rate that corresponds to a collection efficiency of less than 97 percent.
- D.5.3 NESHAP Maintenance Requirements [40 CFR Part 63.1160, Subpart CCC]  
The Permittee shall comply with the operation and maintenance requirements of 40 CFR Part 63.6(e) (Subpart A, General Provisions). Pursuant to 40 CFR Part 63.1160, Subpart CCC, the Permittee shall prepare an operation and maintenance plan for each emission control device to be implemented no later than the compliance date. The plan shall be incorporated by reference into the source's Title V Permit. All such plans must be consistent with good maintenance practices and, for a scrubber emission control device, must at a minimum:

- (c) Require cleaning of the scrubber internals and mist eliminators at intervals sufficient to prevent buildup of solids or other fouling;
- (d) Require an inspection of each scrubber at intervals of no less than 3 months with;
  - (1) Cleaning or replacement of any plugged spray nozzles or other liquid delivery devices;
  - (2) Repair or replacement of missing, misaligned, or damaged baffles, trays, or other internal components;
  - (3) Repair or replacement of droplet eliminator elements as needed;
  - (4) Repair or replacement of heat exchanger elements used to control the temperature of fluids entering or leaving the scrubber; and
  - (5) Adjustment of damper settings for consistency with the required air flow.
- (e) If the scrubber is not equipped with a viewport or access hatch allowing visual inspection, alternate means of inspection approved by the Administrator may be used.
- (f) The Permittee shall initiate procedures for corrective action within 1 working day of detection of an operating problem and complete all corrective actions as soon as practicable. Procedures to be initiated are the applicable actions that are specified in the maintenance plan. Failure to initiate or provide appropriate repair, replacement, or other corrective action is a violation of the maintenance requirement.
- (g) The Permittee shall maintain a record of each inspection, including each item identified in (d) above, that is signed by the responsible maintenance official and that shows the date of each inspection, the problem identified, a description of the repair, replacement, or other corrective action taken, and the date of the repair, replacement, or other corrective action taken.

D.5.4 Particulate Matter (PM) [40 CFR 52 Subpart P]

Pursuant to 40 CFR 52 Subpart P, the PM from the Pickle Line shall not exceed the pounds per hour emission rate established as “E” in the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of 60,000 pounds per hour shall be accomplished by use of the equation:

$$E = 55.0 P^{0.11} - 40 \quad \text{where} \quad E = \text{rate of emission in pounds per hour; and} \\ P = \text{process weight rate in tons per hour}$$

At a process weight rate of 222.0 tons per hour for the Pickle Line allowable PM emission rate shall not exceed 59.65 pounds per hour.

## Indiana Department of Environmental Management Office of Air Quality

### Technical Support Document (TSD) for a Minor Modification to a Construction Permit

#### Source Background and Description

Source Name:	U.S. Steel - Midwest Plant
Source Location:	U.S. Route 12, Portage, Indiana 46368
County:	Porter
SIC Code:	3316
Construction Permit No.:	127-8136-00009
Construction Permit Issuance Date:	June 9, 1997
Minor Modification No.:	127-18670-00009
Permit Reviewer:	Walter Habeeb

The Office of Air Quality (OAQ) has reviewed a modification request from U.S. Steel - Midwest Plant relating to the entry end of the number 1 continuous pickle line which was permitted under CP 127-8136-00009. This modification request consist of the following:

Reconstruction of Entry End of Number 1 Continuous Pickle Line so it can accommodate larger diameter coils.

#### History

On June 9, 1997, U.S. Steel - Midwest Plant was issued Construction Permit CP127-8136-00009 for the operation of a steel finishing facility.

#### Explanation of Modification

The Permittee in a letter dated March 15, 2004 to IDEM, OAQ requested permission to reconstruct the entry end of their number 1 Continuous Pickle Line (CPL) so it can accommodate larger coils. The project will result in a slight increase in the actual annual steel strip throughput through the CPL. This will result in a potential increase of 4.114 ton per year of HCl emissions (see appendix A page 1of 1for calculation of the increase).

Process/facility	Potential to Emit of Modification (tons/year)						
	PM	PM-10	SO <sub>2</sub>	VOC	CO	NO <sub>x</sub>	HAPs
Reconstruct Entry End No. 1 CPL	0.52	0.52	0.00	0.00	0.00	0.00	4.114

There are no changes to other pollutants due to this modification.

#### Justification for the Modification

The Construction Permit is being modified through a minor modification because no emission limitation in the original permit is being relaxed. As specified in 326 IAC 2-7-10.5 (d)(6) this modification is subject NESHAP where the NESHAP is the most stringent applicable requirement. The source has stated in the modification request that the only regulated air pollutant emitted from the No. 1 CPL that will be affected by this project with respect to the annual rate of emission is HCl. This modification is being performed pursuant to IC 13-15-7-1.

### Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the modification request submitted by the applicant.

A complete application for the purposes of this review was received on March 15, 2004.

### Emission Calculations

See Appendix A (page 1 of 1) of this document for detailed emissions calculations.

### Conclusion

The construction of this proposed modification shall be subject to the conditions of the attached Modification Construction Permit No. 127-8136-00009.

### Changes Proposed

The following changes have been proposed (Bold has been added and strikethrough has been omitted):

Section A.3 (e)

- (e) Pickle Line (Installed in 1961) with a capacity of **222.0** tons per hour of steel (**entry end of no. 1 CPL modified in 2004 to handle larger diameter coils**) consisting of the following:

Section D.5 Facility Description [326 IAC 2-7-5(15)]:

- (e) Pickle Line (Installed in 1961) with a capacity of **222.0** tons per hour of steel (**entry end of no. 1 CPL modified in 2004 to handle larger diameter coils**) consisting of the following:

#### D.5.4 Particulate Matter (PM) [40 CFR 52 Subpart P]

Pursuant to 40 CFR 52 Subpart P, the PM from the Pickle Line shall not exceed the pounds per hour emission rate established as "E" in the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of 60,000 pounds per hour shall be accomplished by use of the equation:

$$E = 55.0 P^{0.11} - 40 \quad \text{where } E = \text{rate of emission in pounds per hour; and} \\ P = \text{process weight rate in tons per hour}$$

At a process weight rate of ~~465.5~~ **222.0** tons per hour for the Pickle Line allowable PM emission rate shall not exceed ~~56.5~~ **59.65** pounds per hour.

Appendix A  
US Steel- Midwest Plant  
Portage, Indiana

Calculations of Emissions Increase from the  
Number 1 Continuous Pickle Line

Maximum annual steel throughput = (max. steel throughput capacity =222TPH) (8760 hr/yr)  
= 1,944,720 tons of steel per year

Past Actual Throughput = 1,374,446 tons/yr (from Table 1 –source information)

Average Annual HCL consumption rate = 11.1 lb/ton of steel (From Table 1 –source information)

Estimated Weight Fraction HCL = 0.0013 lb HCL emitted / lb of HCL consumed (from Table 1 – source information)  
(emitted to air -after controls)

Future Max. potential throughput = 1,944,720 tpy

Past Actual Throughput = 1,374,446 tpy

Increase = 570, 274 tpy

**Potential HCL Emission Increase for the project (future potential – past actual)**

HCL (ton/yr) = (570,274 ton/yr) (11.1 lbs HCL used /ton) (0.0013 lb HCL emitted/lb HCL used) (1ton HCL/2,000lb HCL)  
= **4.114 tons HCL/yr**

**PM – PM10 Emissions**

**Estimate of Emissions of Ferrous Chloride from the Scrubber Stack**  
(Provided by U.S. Steel - Midwest Plant)

**Givens:**

1. Tests conducted on December 4, 2001 indicate the following
  - a. Mist emission rate at the stack is 5 lbs per hour
  - b. Dilution ratio of mist through the scrubber is 8.2 to 1
2. Pickling solutions nominally run 6 to 9 percent iron (Fe) by weight

**Assume:**

1. Concentration of ferrous chloride (FeCl<sub>2</sub>) in mist droplets exhausted to the scrubber is the same as is the pickling solution.
2. All mist exhausted from the stack evaporates to dryness in the atmosphere leaving dissolved FeCl<sub>2</sub> as solid particles

**Calculations:**

$$\frac{5 \text{ lbs mist}}{\text{hr}} \times \frac{0.09 \text{ lbs Fe}}{\text{lb mist}} \times \frac{129 \text{ lbs FeCl}_2}{59 \text{ lbs Fe}} \times \frac{1 \text{ lb FeCl}_2 \text{ @ stack}}{8.2 \text{ lbs FeCl}_2 \text{ @ inlet}} = 0.120 \text{ lbs FeCl}_2 / \text{hr}$$

$$\frac{0.120 \text{ LBS FeCl}_2}{\text{hr}} \times \frac{8,760 \text{ hrs}}{\text{yr}} \times \frac{1 \text{ ton}}{2,000 \text{ lb}} = \mathbf{0.52 \text{ tons FeCl}_2 / \text{yr}}$$