ALLEGHENY COUNTY HEALTH DEPARTMENT
AIR QUALITY PROGRAM

October 26, 2018

SUBJECT: Review of Application
Operating Permit
McConway and Torley LLC
109 48th Street
Pittsburgh, PA 15201-2755

RE: Operating Permit File No. 0275

TO: JoAnn Truchan, P.E.
Section Chief, Engineering

FROM: David D. Good
Air Pollution Control Engineer

FACILITY DESCRIPTION:

The McConway and Torley LLC (McConway and Torley) facility is a manufacturer of steel railcar products and mining castings. The types of processes conducted at the facility include steel melting, casting, heat-treating and finishing. The facility is a synthetic minor source of carbon monoxide (CO), as defined in §2101.20 of Article XXI. The facility is a minor source of particulate matter less than 10 microns in diameter (PM10), particulate matter less than 2.5 microns in diameter (PM2.5), volatile organic compounds (VOCs), nitrogen oxides (NOX), sulfur dioxide (SO2), and hazardous air pollutants (HAPs) emissions, as defined in §2101.20 of Article XXI.

PROCESS SUMMARY:

Scrap metal that is stored in an open building (separate from main building) is loaded onto a rail car by a large magnet. The scrap metal is transported to the main building by a railcar and loaded into one of the two (2) electric arc furnaces (EAF). The metal is melted for approximately two to three hours and tapped into a ladle. An overhead crane transfers the molten steel to the pouring area to be poured into individual molds. The sand molds are shaped internally by cores and are both produced in a separate area of the facility. The molten steel cools to a desired hardness and the molds are then sent to shakeout process to break apart the molds and recover the sand. The steel castings proceed onto finishing operations and the sand is sent to a reclaiming process. The facility is limited to melting 92,500 tons/year of steel and using 540,000 pounds of resin (parts 1 and 2). The entire list of operations is contained in Table 1 below.

Table 1: Facility Process Summary

I.D.	SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
P001 - Steel Making	-	-	-	-	-
P001-1	Charge Handling	None	22 tons/heat	Scrap Metal	N/A
P001-2A/B	Ladle Pre-Heaters (2)	None	3.5 MMBtu/hr	Natural Gas	N/A
P001-3A/B	Stopper Rod Tables (2)	None	0.2 MMBtu/hr	Natural Gas	N/A
P001-4	Lance Table	None	0.2 MMBtu/hr	Natural Gas	N/A
P001-5	EAF #1 Furnace	Baghouse No. 11	22 tons/heat	Scrap metal, internal recycle, alloys, other additives	
P001-6	EAF #2 Furnace	Baghouse Nos. 9 & 10	22 tons/heat	Scrap metal, internal recycle, alloys, other additives	
P002 - Core Making	-	-	-	-	-
P002-1	Core Room Sand Handling and Silos	Bin Vent	27,000 tons/yr of sand	Sand	
P002-2	OB2 Core Room Sand Handling and Silo	Baghouse	5.76 tons/hr of sand	Sand	
P002-5	A-12 Core Machines (2)	Dekota Scrubber DI-54	5.76 tons/hr of sand	Sand, Resin	N/A
P002-6	OB2 Core Machine (2)	None	5.76 tons/hr of sand	Sand, Resin	N/A
P002-7	Alcohol Wash Operations	None	10,000 lb/yr core wash	Isopropanol	N/A
P002-8A	Existing Wisconsin Core Oven	None	1.6 MMBtu/hr 27,000 tons/yr sand	Natural Gas	N/A
P002-8B	IP # 9 Wisconsin Core Oven	None	1.8 MMBtu/hr 27,000 tons/yr sand	Natural Gas	N/A
P002-9	Loramendi Machines (2)	Dekota Scrubber DI-54		Sand, Resin	N/A
P002-10	Laempe Machine	Dekota Scrubber DES-68		Sand, Resin	N/A
P002-11	Core Release				
P003- Sand Handling Operations	-	-	-	-	-
P003-1	Sand Handling and Preparation	Baghouse No. 12	N/A	Sand	
P003-2	Casting Shakeout	Baghouse No. 12	N/A	Sand	

I.D.	SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
P003-3	Sand Reclamation	Baghouse No. 12	N/A	Sand	
P003-3a	Sand Reclamation – Cooler/Classifier	Baghouse No. 12	N/A	Sand	
P003-3b	Sand Reclamation – Vibra-Mill	Baghouse No. 12	N/A	Sand	
P003-3c	Sand Reclamation – Rotary Reclaimers	Baghouse No. 12	N/A	Sand	
P003-4	Mold Making Systems	Baghouse No. 12	N/A	Sand	
P003-5	Intermediate Sand Storage	Baghouse No. 12	Two 15-ton silos; 5,000 ft^3 Dust Silo	Sand	
P003-6	Bentonite Storage	Bin Vent Collector		Sand	
P003-7	Sand Dust Silo	Baghouse No. 12	5,000 ft^3	Processed Sand	
P003-8	Sand Lifter	None	300 SCFM	Processed Sand	N/A
P003-9	Mold Release	None			All 6 BH exhausts
P004 - Casting Operations	-	-	-	-	-
P004-1	Mold Pouring	None	22 tons/heat	Molten Steel	All 6 BH exhausts
P004-2	Casting Cooling	None	22 tons/heat	Molten Steel	All 6 BH exhausts
P005 – Pre-finishing Operations	-	-	-	-	-
P005-1	Gas Torch Burning	None	0.5 MMBtu/hr	Natural Gas	N/A
P005-2	Air Arc Welding Tables	Baghouse No. 6	64,750 tons/yr	Steel, Welding Rod	N/A
P005-3A/B	Shot Blast Units	Baghouse No. 2 Baghouse No. 12	64,750 tons/yr	Steel	
P005-4	Spinner Hanger Blast Units	Baghouse No. 2	64.750 tons/yr	Steel	
P006 - Finishing Operations	-	-	-	-	-
P006-1	Robotic Knuckle Machines	Dust Collector	64,750 tons/yr	Steel	

I.D.	SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
P006-2	Hand Grinding Stations	None	64,750 tons/yr	Steel	
P007 - Heat Treating Operations	-	-	-	-	-
P007-1	Heat Treating Furnaces	None	10 Units at 6.0 MMBtu/hr (each)	Natural Gas	N/A
Miscellaneous	-	-	-	-	-
B001	Space Heaters and Furnaces	None	10 MMBtu/hr (total)	Natural Gas	N/A
B002	In-Building Equipment (propane)				
B003	In-Building Equipment (fuel oil)				
D001	On-Site Diesel Fuel Tank	None	66,000 Gallons/yr	Diesel Fuel	N/A
F001	On-Site Vehicles	None	35 Vehicles/yr	N/A	N/A
F002	In-Building Vehicle Traffic				
D001	Fuel Oil Tank	None	500 Gallons	Fuel Oil	
EX001	Sand Silos (2)	Bin Vent Collectors		Sand	N/A
EX004	Closed Loop Cooling Towers	None			

CHANGES TO SYNTHETIC MINOR SOURCE THROUGHPUT LIMITS:

McConway and Torley has historically been considered either a natural minor or synthetic minor source of PM_{10} emissions. During the last 8 years, the following events and submissions have occurred:

1. Operating Permit Application was submitted to Department listing maximum production potential of 116,800 tons/year of steel (2008). An installation permit issued in 2007 stated the maximum production potential was 65,700 tons/year of steel.
2. Installation Permit Application (IP7) to reactivate an old EAF was received in 2008 with a maximum production potential of 116,800 tons/year of steel.
3. Coupled with the above installation, the potential production was reduced to 92,500 tons/yr of steel to remain a synthetic minor of PM_{10}.
4. IP7 was issued on 1/21/2011. The facility was now permitted for two (2) EAFs with a combined production limit of 92,500 ton/yr steel.
5. A stack test on EAF 2 (IP7) was performed in July 2012. The facility exceeded numerous parameters including, but not limited to, PM_{10} (filterable + condensable), baghouse performance efficiency, CO & VOC.
6. The facility performed diagnostic testing and re-tested the baghouse on 2/1/2013. There were again test results that were higher than expected, but the results showed improvement from the previous stack

test. New emission limits were proposed for PM_{10}, CO & VOC that would keep the facility below major source levels at the 92,500 ton/yr production limit.

7. Installation Permit Application (IP8) was submitted to update EAF 1 with new capture hoods and a baghouse similar in function to IP7. IP8 was issued on 8/22/2013.
8. IP 9 application was received on 3/7/2013 for new core-making units. The overall core-making production was to remain the same. IP 9 was issued on 11/26/2013.
9. A draft permit was put out to public comment in March of 2015 assuming no building control for PM_{10}, no estimates for carbon monoxide for pouring/cooling/shakeout, and conservative estimates for hazardous air pollutants such as benzene based on mass balances and laboratory experiments.
10. The facility demonstrated successful EPA Method 204 testing in May of 2015, showing that the main foundry building is under constant negative pressure and that all of the emissions occurring within that building are being routed to one of the seven baghouses. This created the following:
    1. There are no fugitive emissions exiting the facility as long as all seven baghouses are operating.
    2. Emissions that are not directly captured by a control device, such as pouring, cooling and sand-handling are now captured by one of the seven baghouses. It is also now possible to measure and quantify all of the previously estimated or unknown emissions such as carbon monoxide and benzene.
    3. PM_{10} emission estimates are now significantly lower since they are only exiting the facility via one of the baghouses and, in turn, are being controlled to a level of 99-99.9% less than uncontrolled.
11. Because it was now possible to quantify the previously unknown emissions such as facility-wide carbon monoxide and benzene, the Department and M&T worked together to develop a testing program to measure the emissions of all seven baghouses while the foundry was operating at or near full capacity. The emission factors developed from the testing would be use to quantify unknown gaseous emissions and set production limits for the facility to remain a synthetic minor source of all pollutants.
12. IP 11 was issued on February 29, 2016 to install new Ladle Preheaters.
13. IP 13 was issued on February 29, 2016 to replace Baghouse Nos. 5 and 8 with a new Baghouse, No. 12. Additionally, new sand reclaimers and storage units were installed. After the installation of the new baghouse, the facility now has 6 total baghouses that exhaust from the main foundry building.
14. The facility performed a facility-wide test on all seven (at the time) baghouses for nitrogen oxides, carbon monoxide, volatile and semi-volatile organic compound emissions on November 10 and 11, 2016. The results were submitted to the Department on December 28, 2016.

<u>Fugitive Emissions Control Estimate Changes</u>

The Department has historically allowed fugitive emissions released inside of a building to have a certain level of control ascribed to them for purposes of emissions inventory and permitting. Upon review of this procedure, it was found to have no technical basis to reference and was incongruent with policies and procedures of other air agencies, including, but not limited to, the PADEP, Ohio EPA and Oregon DEQ. The Department no longer allows for the use of buildings as a control device for particulate matter in Allegheny County unless the reduction is physically measurable.

McConway and Torley has demonstrated that the main foundry building is under constant negative pressure while the baghouses are in operation. Because these (now) 6 baghouses are the only exit points for airflow, there are no fugitive emissions from inside of the foundry building. All of the emissions, particulate and gaseous, are captured by one of the six baghouses. The fugitive emissions estimates, which made up a majority of the particulate emissions in previous emissions estimates, have since been eliminated and the potential PM_{10} emissions do no encroach upon major source (100 tpy) limits.

<u>Pouring and Cooling Emissions Estimate Changes</u>

The particulate and gaseous emissions from pouring and cooling previously represented the biggest unknown quantities from the facility in the past. As stated above, the fugitive particulate emissions are now believed to be captured by one of the six baghouses before ultimately exiting the facility. The gaseous (carbon monoxide, benzene, etc.) emissions can now be directly measured by taking the sum of the emissions from all of six baghouse exhausts. The emissions were directly measured on November 10th and 11th, 2016. The results of those tests were used to set

the emissions and production limits for the facility.

Carbon Monoxide Emissions Estimate Changes

The CO emissions have been measured and quantified from every baghouse at the facility. See above.

Benzene and other HAPs Emissions Reductions

The benzene emissions have been measured and quantified from every baghouse at the facility. The maximum potential benzene emissions have been reduced from 9.67 tons/yr to 1.21 tons/yr. The testing also showed significantly lower levels of phenol and naphthalene than what were previously estimated.

VOC Emissions Reductions

The VOC emissions have been measured and quantified from every baghouse at the facility. The maximum potential VOC emissions are 14.94 tons/yr, which are significantly lower that previous estimates of 34 tons/yr. This includes elective usage of 5 tons/yr of alcohol use and 2 tons/yr of mold release (20% VOC), which were both not used during the facility-wide baghouse testing. Normal operations typically do not use either alcohol or mold release with 20% VOC. The facility-wide limits during testing are compared the results obtained for no alcohol or 20% VOC mold release agents, which is 7.94 tons/yr. The VOC emission limits do not include methane, ethane or acetone, which are each not considered a VOC by the EPA.

ACHD Emissions Estimates of PM_{10}

The elimination of fugitive emissions (see above) allows the Department to estimate the emissions by direct measurement from the baghouses instead of using emission factors such as AP-42, which was previously done for many of the sources at M&T.

EMISSION CALCULATIONS:

EAF:

Particulate Emissions

The BACT filterable PM (FPM) limit of 0.0022 gr/dscf was voluntarily reduced to 0.0012 gr/dscf by M&T and was used to calculate potential PM, which is more restrictive than the PM limits found in §63.10895(c). Results from July 2012 and February 2013 stack tests on EAF #2 were used in conjunction with the BACT FPM limit to derive the potential filterable and condensable PM_{10} and $PM_{2.5}$ and Metal HAPs. The PM_{10} and $PM_{2.5}$ emission limits take into account the uncertainty in the condensable emissions which varied between the two tests by 300% (see attached).

Gaseous Emissions

Please refer to the attached spreadsheet for detailed emissions calculations. Because the foundry building is under negative pressure and there are several emissions sources that are not directly captured (vent internally), the EAF baghouse hoods collect gaseous emissions from a variety of sources. Results from the facility-wide testing in November 2016 were used to derive the facility-wide emission limits for CO, NO_X and VOC. The CO, NO_X and VOC emission factors were taken to be 125% of the stack test results for each baghouse to account for uncertainty and an additional 15% added on to account for emissions migration between baghouses (see spreadsheet).

Table 2: EAF Baghouse Emissions Summary

POLLUTANT	Process	Emission Factor	Units	Reference
PM	EAFs	0.0012	Gr./DSCF	BACT
PM	EAF #1	0.120	Lbs/ton-metal charged	BACT
PM	EAF #2	0.10	Lbs/ton-metal charged	§63.10895(c)(2)
PM10	EAFs	0.30	Lbs/ton-metal charged	ACHD, Stack Test (7/12, 2/13)
PM2.5	EAFs	0.30	Lbs/ton-metal charged	ACHD, Stack Test (7/12, 2/13)
SO_2	EAFs	0.430	Lbs/ton-metal charged	ACHD, IP7 & IP8
NO_X	EAF 1	0.60	Lb/ton-metal charged	ACHD, Stack Test (11/16 + 25%, +15%)
NO_X	EAF 2	0.48	Lb/ton-metal charged	ACHD, Stack Test (11/16 + 25%, +15%)
NOx	All 6 baghouses	0.98	Facility-wide limit (lbs/ton-metal)	ACHD, Stack Test (11/16 + 25%)
CO	EAF 1	0.89	Lb/ton-metal charged	ACHD, Stack Test (11/16 + 25%, +15%)
CO	EAF 2	0.58	Lb/ton-metal charged	ACHD, Stack Test (11/16 + 25%, +15%)
CO	All 6 baghouses	2.08	Facility-wide limit (lbs/ton-metal)	ACHD, Stack Test (11/16 + 25%)
VOC	EAF 1	0.05	Lb/ton-metal charged	ACHD, Stack Test (11/16 + 25%, +15%)
VOC	EAF 2	0.01	Lb/ton-metal charged	ACHD, Stack Test (11/16 + 25%, +15%)
VOC	All 6 baghouses	0.17	Facility-wide limit (lbs/ton-metal)	ACHD, Stack Test (11/16 + 25%)
Metal HAPs(*)	EAFs	0.0035	Lbs/ton-metal charged	ACHD, Stack Test (7/12, MHAP/PM ratio +15%)

(*) Metal HAPs such as Arsenic, Cadmium, Chromium, Cobalt, Lead, Manganese & Nickel

Sand and Bentonite Operations:

Storage

Sand is stored in two (2) 200 ton sand silos that are each controlled by a bin vent dust collector for particulate emissions. Four (4) 25 ton sand silo surge bins are also each controlled by a bin vent dust collector. There is one (1) 200 ton bentonite storage and feed system also controlled by a bin vent dust collector. See the attached emissions spreadsheet for detailed calculations for each process.

Table 3: Sand Storage Emission Factors

	Process	Emission Factor	Units	Building Control	Reference
PM, PM_{10}, $PM_{2.5}$	Sand Storage Bin Vent	0.02	gr/ACFM	None	BACT

PM, PM_{10}, $PM_{2.5}$ = [(2 x 0.02 gr/ACFM) x 190 ACFM x 60 min/hr x 8760 hr/yr x / 7000 gr/lb] = 1,129 lb/yr = **0.565 ton/yr** = **0.13 lb/hr**

Sand surge silos:

Table 4: Sand Surge Emission Factors

	Process	Emission Factor	Units	Building Control	Reference
PM, PM_{10}, $PM_{2.5}$	Sand Surge Bin Vent	0.02	gr/ACFM	None	BACT

PM, PM_{10}, $PM_{2.5}$ = [(7 x 0.02 gr/ACFM) x 376 ACFM x 60 min/hr x 8760 hr/yr x / 7000 gr/lb x (1-0.00)] = 1.997 lb/yr = **0.999 ton/yr** = **0.23 lb/hr**

Bentonite Storage silo:

Table 5: Bentonite Storage Emission Factors

	Process	Emission Factor	Units	Building Control	Reference
PM, PM_{10}, $PM_{2.5}$	Bentonite Storage Bin Vent	0.02	gr/ACFM	None	BACT

PM, PM_{10}, $PM_{2.5}$ = [(0.02 gr/ACFM) x 190 ACFM x 60 min/hr x 8760 hr/yr x / 7000 gr/lb] = 565 lb/yr = **0.28 ton/yr** = **0.06 lb/hr**

Sand Handling

To make the molds, the sand is loaded from a large hopper into a smaller hopper in order to be poured into the core boxes. As the sand is being poured, the resin mix ingredients are blended into the sand from two separate drums in the appropriate proportions. The sand handling particulate emissions are controlled by Baghouse No. 12, which also serves as the control device for casting shakeout (see emissions calculations in Baghouse No. 12 section below). See the attached emissions spreadsheet for detailed calculations for each process.

Mold Making

Molds are forms used to shape the exterior of castings and are prepared from wet sand, clay and additives. The emissions are captured and controlled by Baghouse No. 12 See below for particulate emissions calculations and the attached emissions spreadsheet for detailed calculations for each process.

Shakeout

Solidified metal components are removed from their mold by the shakeout process. During shakeout, high energy vibration of the molds is performed overtop of metal runners and gates to free the castings from the sand and collect the solids and aerosols formed by the process. The emissions are captured within the unit and controlled by Baghouse No. 12. See emissions calculations in Baghouse No. 12 section below and the attached emissions spreadsheet.

Sand Reclaim

Used sand from the castings shakeout is recycled and reused in the sand reclaim process. The sand is screened and reused to make new molds. The emissions are captured and within the unit and controlled by baghouse No. 12. See emissions calculations in Baghouse No. 12 section below and detailed emissions calculations in the attached emissions spreadsheet.

Baghouse No. 12 (sand handling, reclaim and shakeout)

Particulate Stack Emissions:

The Sand Handling and Preparation, Casting Shakeout, Mold Making, Sand Reclamation and Waste Sand Roll-Off

processes and the Intermediate Sand Storage Silos will all be routed to Baghouse No. 12. Baghouse No. 12 is rated at a nominal 180,000 ACFM, which is an increase from the combined ~130,000 ACFM that was measured during stack tests for Baghouse Nos. 5 & 8. The bags for the new baghouse meet BACT requirements (see below) and are guaranteed from the vendor to meet a maximum emission rate of 0.0022 gr/dscf. It is assumed that all (filterable) PM = PM_{10} = $PM_{2.5}$, since the particle size distribution of the exhaust stream will be drastically altered after going through the baghouse.

Filterable PM, PM_{10}, $PM_{2.5}$ = [(0.0022 gr/ACFM) x 180,000 DSCFM x 60 min/hr x 8760 hr/yr x / 7000 gr/lb] = 29,734 lb/yr = **3.39 lb/hr** = **14.87 ton/yr**

Condensable PM (from 2008 stack tests +50%) = **1.59 lb/hr = 6.96 ton/yr**

Gaseous Stack Emissions:

Please refer to the attached spreadsheet for detailed emissions calculations. Because the foundry building is under negative pressure and there are several emissions sources that are not directly captured (vent internally), the Baghouse No. 12 hoods collect gaseous emissions from a variety of sources other than the processes it directly captures. Results from the facility-wide testing in November 2016 were used to derive the facility-wide emission limits for CO, NO_X and VOC. The CO, NO_X and VOC emission limits were taken to be 125% of the stack test results and take into account the uncertainty (see attached). The individual hourly and annual NO_X and CO limits were given an additional 30% uncertainty to account for the higher airflow compared to the baghouses that it replaced (5 & 8). The Phenol and Naphthalene limits were derived from the Baghouse No. 12 testing in August 2017.

Table 6: Baghouse 12 & Gaseous Emissions

POLLUTANT	Process	Emission Factor	Units	Reference
PM, PM_{10}, $PM_{2.5}$	Baghouse No. 12	0.0022	Gr./DSCF	BACT
PM Condensable	Baghouse No. 12	1.59	Lb/hr	ACHD, Stack Test (2008)
NO_X	Baghouse No. 12	0.0143	Lb/ton-metal charged	ACHD, Stack Test (11/16 + 25%, +15%)
NO_X	All 6 baghouses	0.98	Facility-wide limit (lbs/ton-metal)	ACHD, Stack Test (11/16 + 25%)
CO	Baghouse No. 12	0.73	Lb/ton-metal charged	ACHD, Stack Test (11/16 + 25%, +15%)
CO	All 6 baghouses	2.08	Facility-wide limit (lbs/ton-metal)	ACHD, Stack Test (11/16 + 25%)
VOC	Baghouse No. 12	0.14	Lb/ton-metal charged	ACHD, Stack Test (11/16 + 25%, +15%)
VOC	All 6 baghouses	0.17	Facility-wide limit (lbs/ton-metal)	ACHD, Stack Test (11/16 + 25%)
Benzene	All 6 baghouses	1.21	Facility-wide limit (tpy)	ACHD, Stack Test (11/16 + 25%)
Phenol	All 6 baghouses	2.46	Facility-wide limit (tpy)	ACHD, Stack Test (8/17 + 25%)
Naphthalene	All 6 baghouses	1.72	Facility-wide limit (tpy)	ACHD, Stack Test (8/17 + 25%)

Core Making:

Cores are pieces that are placed into casting molds to form internal cavities of the steel castings. The cores are made from chemically bonded sand by mixing sand with a two-part chemical binder system (ISOCURE Parts I and II).

A third part, the catalyst (ISOCURE Catalyst), is introduced into the mixed sand to set or cure the core. If a core wash is used, the cores are then dried in a core oven. The production limit of the combined core-making units has been set at 27,000 tons/year. The VOC emission factors are from a 2017 stack test of the existing and new Dekota Scrubbers. The VOC limits were based on the maximum hourly and annual production limits (23 tons/hr and 27,000 tons/yr) using the DI-54 Dekota scrubber. The core-making and scrubber units vent internally. All of the VOC emissions are ultimate captured and exit though one of the facility-wide baghouses.

1.0 cycle/10 sec x 3600 sec/hr x 32 lb core/cycle x 1.0 ton/2000 lbs = **5.76 tons/hr** of sand cores (each unit)

Table 7: Core-Making Emission Factors

	Process	Emission Factor	Units	Reference
VOC	Core Making	0.246	Lbs/ton-sand handled	2017 Stack Test on Dekota Scrubber DI-54 (0.97 lb/ton), + 25%

DI-54 Scrubber Hourly VOC emissions = [(0.246 lb/ton sand) x 23 tons/hr)] = 1.13 lb/hr
DI-54 Scrubber Annual VOC emissions = [(0.246 lb/ton sand) x 27,000 tons/yr) / (2000 lb/ton)] = 3.32 ton/yr

Pre-finishing and Finishing Operations:

Pre-finishing operations include gas torch burning, air arc welding tables, shot blast units and spinner hanger blast units. Finishing operations include robotic knuckle machines and hand grinding stations. The air arc welding tables are controlled by Baghouse no. 6. The spinner hanger blast and shot blast unit no. 2 are controlled by baghouse no. 2. Shot blast unit no. 1 is controlled by baghouse no. 12. See the attached emissions spreadsheet for detailed gaseous calculations for each baghouse. The particulate emissions limits on baghouse nos. 2 and 6 are listed below:

Baghouse no. 2 Filterable PM, PM_{10}, $PM_{2.5}$ = [(0.0052 gr/ACFM) x 38,000 DSCFM x 60 min/hr x 8760 hr/yr x / 7000 gr/lb] = **1.69 lb/hr** = **7.42 ton/yr**

Baghouse no. 6 Filterable PM, PM_{10}, $PM_{2.5}$ = [(0.0052 gr/ACFM) x 65,000 DSCFM x 60 min/hr x 8760 hr/yr x / 7000 gr/lb] = **2.90 lb/hr** = **12.69 ton/yr**

Fuel Burning Operations:

Fuel burning operations include heat treating furnaces, space heaters and furnaces.

Miscellaneous:

Miscellaneous operations include vehicle traffic, on-site diesel fuel tank, two (2) ladle pre-heaters, two (2) stopper rod tables and a lance table.

OPERATING PERMIT APPLICATION COMPONENTS:

1. Operating Permit Application received February 28, 2008.
2. Revised Operating Permit Application received August 6, 2010.
3. Revised Operating Permit Application Calculations received January 10, 2012.
4. Revised Operating Permit Application Calculations received April 16, 2013.
5. Proposed Revised Emission Limits Received June 6, 2013.
6. Meeting with McConway & Torley on November 7, 2013.
7. Stack test results from facility-wide testing in November 2016.
8. Baghouse 12 testing in August 2017.

INSTALLATION PERMITS:

1. ACHD Installation Permit No. 0275-I003

This permit is for the installation of a new Artisand H-80 Core Making Unit for the manufacturing of sand cores.

2. ACHD Installation Permit No. 0275-I004

This installation permit is for the modification of the existing mold making and casting handling system through the replacement of molding equipment with automated equipment; the replacement of the casting shakeout machine with a shaker table; and the realignment of the existing mold/flask conveyor systems. This modification is expected to streamline the process, but will not result in an increase in production, since the existing ancillary equipment (sand preparation, storage silos, and sand reclaim system) and the heat duration of 2 hours are the limiting factors of the throughput.

3. ACHD Installation Permit No. 0275-I005

This permit is for the installation of an additional A-12 Core Making Unit for the manufacturing of sand cores. An existing wet scrubber will be used for the control of VOC and HAP emissions from the process.

4. ACHD Installation Permit No. 0275-I006

This permit is for the installation of an additional A-12 Core Making Unit and an H-80T Core Making Unit for the manufacturing of sand cores. An existing wet scrubber will be used for the control of odor, VOC and HAP emissions from the process.

5. ACHD Installation Permit No. 0275-I007

This permit is for the installation of a new Electric Arc Furnace (EAF) which is a new affected source to a large foundry as defined in §63.10880(b)(2). With the addition of this new unit, this facility will have a total of two (2) EAF's. Two new baghouses will be used for the control of Particulate Matter (PM) and metal HAP emissions from the process.

6. ACHD Installation Permit No. 0275-I008a

This permit is for the installation of new pollution control devices (baghouse and capture hoods) on an Electric Arc Furnace (EAF #1), which is an existing affected source of a large foundry, as defined in §63.10880(b)(1). One new baghouse and capture hood will be used for the control of filterable PM, PM10, PM2.5 and Metal HAP emissions from the process. The facility has a total of two (2) EAF's that share an annual production limit to remain a synthetic minor source of CO.

7. ACHD Installation Permit No. 0275-I009

This installation permit is for the addition of an A-12 core-making unit and three (3) Lampe/Loramende core-making units. McConway and Torley currently operate three (3) A-12 core-making units, two (2) H-80 core making units two (2) Sand Silos, four (4) Sand Silo Surge Bins, one (1) Bentonite Storage and Feed System, two (2) Core Wash Dip Stations and one (1) Wisconsin Core Oven.. All of the core-making units are manufactured by Artisand Specialty, Inc. Cores are pieces that are placed into casting molds to form internal cavities of the steel castings. The cores are made from chemically bonded sand by mixing sand with a two-part chemical binder system (ISOCURE Parts I and II). A third part, the catalyst (ISOCURE Catalyst), is introduced into the mixed sand to set or cure the core. The production limit of the combined core-making units has been reduced from 35,000 tons/year to 27,000 tons/year.

8. ACHD Installation Permit No. 0275-I011a

This permit is for the installation new ladle pre-heaters.

9. ACHD Installation Permit No. 0275-I013a

This installation permit is for the replacement of baghouse nos. 5 and. 8 with a single baghouse dust collector designed at a nominal 180,000 ACFM with 7 modules and bags rated at 0.0022 gr/dscf, installing new sand reclamation equipment (10 ton/hr vibra-mill and two (2) rotary reclaimers), adding two (2) sand silos of 15 ton capacity each, and adding several collection hoods and ducts associated with the mold making equipment, mold punchout/shakeout and casting conveying system. There are no expected increases in actual emissions due to these installations.

10. ACHD Installation Permit No. 0275-I014

This installation permit is for the updates in facility-wide equipment and emissions quantifications that affect every installation permit. The facility is under constant negative pressure when foundry operations are occurring, so fugitive emissions no longer exit the facility other than through one of the six (6) baghouses. Engineering estimates and emission factors that were used for many of the potential emissions have now been replaced by stack test results. Additionally, emissions were either unknown (carbon monoxide, etc.) or estimated by way of mass balance (VOC, benzene, etc.) have since been measured at the outlet of every baghouse while the facility was operating at or near maximum operating conditions. This permit supersedes all previously issued Installation Permits at M&T.

REGULATORY APPLICABILITY:

1. Article XXI Requirements for Issuance:

See Permit Application No. 0275 Section 5. The requirements of Article XXI, Parts B and C for the issuance of major source operating permits have been met for this facility. Article XXI, Part D, Part E & Part H will have the necessary sections addressed individually.

2. Method(s) of Demonstrating Compliance:

Compliance with the emission standards set forth in this Operating Permit will be demonstrated by stack testing every five (5) years, recording the total amount of metal produced and sand used in tons, raw materials consumed, the tracking of the hours of operation of the processes, and the monitoring/recording of the operating parameters of the baghouses including the use of a bag leak detection system. In addition, all instances of non-compliance will be reported to the Department on a semi-annual basis. See Operating Permit No. 0275 for the specific conditions for determining compliance.

3. New Source Performance Standards (NSPS)

There are no applicable NSPS for this installation. The requirements of 40 CFR Part 60 Subpart A (Standards of Performance for New Stationary Sources) are not included in the permit because McConway & Torley are not an “affected facility”, as per their exemption for facilities classified as ‘Foundries’ (Letter from EPA to McConway & Torley dated 3/2/01).

The requirements of 40 CFR Part 60 Subpart AA (Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After October 21, 1974 and on or before August 7, 1983) are not included in the permit because of the exemption for facilities classified as ‘Foundries’ (Letter from EPA to McConway & Torley dated 3/2/01).

The requirements of 40 CFR Part 60 Subpart AAa (Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 7, 1983) are not included in the permit because of the exemption for facilities classified as ‘Foundries’ (Letter from EPA to McConway &

Torley dated 3/2/01).

4. **National Emission Standards for Hazardous Air Pollutants (NESHAP)**
National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources (40 CFR Part 63 Subpart ZZZZZ).

5. **Risk Management Plan; CAA Section 112(r):**
The facility is not required to have a risk management plan at this time because none of the regulated chemicals exceed the thresholds in the regulation.

6. **Greenhouse Gas Reporting (40 CFR Part 98):**
Should the facility exceed 25,000 metric tons of actual CO_2e emissions in any 12-month period, the facility will have to submit reports in accordance with 40 CFR Part 98. See §98.2(a)(3) for applicability.

EMISSIONS SUMMARY:

Table 8: Facility Emissions Summary

POLLUTANT	ANNUAL EMISSION LIMIT (tons/year)*
PM_{10}	52.94
$PM_{2.5}$	52.03
Nitrogen Oxides	45.38
Sulfur Oxides	25.1
Carbon Monoxide	96.25
Volatile Organic Compounds**	14.94
Benzene	1.21
Metal HAPs	0.16
Chromium	0.014
Manganese	0.10
Total HAPs	7.98

***** A year is defined as any consecutive 12-month period.
** Includes Alcohol Wash and Mold Release potential emissions.

RECOMMENDATION:

The facility has no unresolved Notices of Violation issued within the last 18 months and it is recommended that Operating Permit No. 0275 be issued.