ENGINEERING ANALYSIS

PROJECT DESCRIPTION

On February 10, 2025, the Department received a permit application from Nucor Tubular Products, Inc. ("NTP Trinity", fka Independence Tube Trinity) requesting that its permitted activities, currently under Air Permit No. 712-0037-X021, be separated from permits associated with the Nucor Steel Decatur, LLC steel mill (Facility No. 712-0037). The NTP Trinity facility is a steel pipe fabrication facility located at 2000 Cooperage Way, Trinity, AL 35673; although the postal code is associated with Trinity, the site is located in Lawrence County rather than Morgan County.

Past determinations for NTP Trinity, including a letter of nonapplicability sent February 11, 2019 and Air Permit No. 712-0037-X021 issued November 22, 2019, treated the NTP Trinity facility as adjacent to, under common control with, and operating within the same industry type as the Nucor Steel Decatur, LLC steel mill. However, these sites are not adjacent, and the Department had erroneously conflated the NTP Trinity site on 2000 Cooperage Way with the NTP Decatur site on 2000 Independence Avenue, which is contiguous with the steel mill. The NTP Decatur site is reportedly a warehouse with no meaningfully emissive processes. After identification of this permitting error through a past inspection, Nucor and the Department agreed to split NTP Trinity activities into separate permits at a later date but to continue to comply with Air Permit No. 712-0037-X021 in the meantime.

The application requests that NTP Trinity be issued synthetic minor operating permits (SMOPs) for the facility's paint line and emergency generator engine.

PROCESS DESCRIPTION

NTP Trinity produces coated steel tubing products from steel coil. Incoming steel coils are uncoiled, flattened into sheets, and cut into strips or slits; these processes are expected to have negligible emissions. Steel slits are then formed into a tube by a mechanical press are then welded together and sprayed with coolant. For tubing made of galvanized steel, the weld seam is remetalized with zinc wire melted and sprayed onto the seam; fumes from this process (as filterable particulate matter) are controlled by a small dust collector. After, tubes are sized, straightened, coated, and cut to specifications. Tubing will be stenciled, treated with rust preventative sprays, or touched up by hand with spray cans as needed.

NTP Trinity has three coating lines: clear-coat, black-coat (large-diameter tubing), and black-coat (small-diameter tubing). Coating is applied by spray gun in all coating lines, but the small diameter tube coating line is equipped with conventional filters for the overspray. Coated tubes are then oven-dried using an electric induction heating bank.

The site also has a 1,400 gpm cooling tower, a 324 HP diesel engine to run an emergency generator, and parts washers using volatile solvents.

EMISSIONS

The basis for the following calculations is 8,760 hours per year of operation unless otherwise specified. VOC and HAP values for coating, coolant, and other assorted materials used were detailed in SDS forms in the application.

The coating lines' potential to emit (PTE) was calculated assuming 4.9 gal/hr of clear coat and 15.2 gal/hr (or 133,152 gal/yr) of black coat (7.6 gal/hr in the large-diameter line and 7.6 gal/hr in the small-diameter line). These assumptions are more conservative than the assumptions used in the aforementioned 2019 applications (28,000 gallons per year of black-coat and 39,200 gallons per year of clear-coat); per Nucor's semiannual reporting, NTP Trinity typically uses no clear coat, but on a highly productive month will use more than 4,000

gallons of black-coat. Although the use of black-coat and clear-coat are mutually exclusive in NTP Trinity's current process, the application calculated PTE based on max consumption of both. VOC and HAP emissions are conservatively assumed to equal VOC and HAP usage. PM emissions are estimated based on the solids content of the coating in question and assuming 65% spray transfer efficiency or equivalent 35% overspray, uncontrolled in the large-diameter coating line and controlled by 90% via conventional filters in the small-diameter coating line.

Spray paint, inspection dye, and stenciling emissions were estimated in the same manner as the coating line emissions, assuming 65% efficient spray application at the rate (either in gal/hr or gal/yr) specified in the application for each material. Cleaning & washing solvents, rust preventative, and coolant used are all composed of VOC with remainder water, with no solids content.

NTP Trinity estimated remetalization emissions on a mass balance basis, given 445.3 lb/ft^3 zinc density and 1,000,000 ft of zinc wire usage per year while assuming a zinc coating with 70% transfer efficiency (or 30% overspray) along the seams of the welded pipes to be 0.1875 inches in width, 120 µm thick, and along an equivalent length of tubes (1,000,000 ft/yr). The concurrent calculations in this analysis correct for NTP Trinity's miscalculation in applying the 30% overspray factor to estimate emissions; while NTP Trinity calculates the mass of the zinc application and estimates emissions to be 30% of that value, I have divided the mass of the zinc application by the transfer efficiency (70%) to estimate the total mass of zinc used and then estimated emissions to be 30% of that value. These calculations rely on the assumption that the length of zinc wire used is greater than or equal to the length of tube seams being remetalized over the course of a year, and emissions from this process may be better estimated in the future by using the gauge of the zinc wire to estimate the mass of the zinc wire used rather than the mass of the zinc layer applied to the tube seams. However, emissions from this process are estimated to be low via either calculation method even before considering the dust collector controlling the zinc fumes from this process.

NTP Trinity estimated engine emissions using AP-42 Chapter 3.3 for small diesel engines at 100 hr/yr. This analysis substitutes those factors with the engine's Tier 3 emission limits where appropriate (assuming a ratio of 2:1 NO_X to NMHC emissions within the engine's combined 4.0 g/kW-hr NO_X + NMHC limit), uses a 500 hr/yr basis, and assumes a 3:2 ratio of filterable to condensable particles.

PM and MHAP emissions from welding were estimated using factors from AP-42 Ch. 12.19 for high-manganese welding wire, and cooling tower emissions were estimated assuming 1,400 gpm recirculation rate, 0.001% drift, and 1,350 ppm total dissolved solids.

Table 1 - Facility PTE before SMOP limitation

Pollutant (TPY)	Coating Lines	Spray Application	Coolant, Solvents, Etc.	Welder	Remetalization	Cooling Tower	Engine	Total Emissions
PM_{Total}	52.67	1.16	-	0.013	0.001	0.04	0.027	53.90
PM_{filt}	52.67	1.16	-	0.013	0.001	0.04	0.016	53.89
$PM_{10,filt}$	52.67	1.16	-	0.013	0.001	0.02	0.016	53.87
$PM_{2.5,filt}$	52.67	1.16	-	0.013	0.001	0.02	0.016	53.87
PM_{con}	-	-	-	-	-	-	0.011	0.01
SO_2	-	-	-	-	-	-	0.001	0.00
NO_X	-	-	-	-	-	-	0.357	0.36
CO	-	-	-	-	-	-	0.464	0.46
VOC	80.31	11.39	12.73	-	-	-	0.179	104.60
Total HAPs	1.39	4.49	0.38	0.008	-	-	0.002	6.27
CO_{2e}	-	-	-	-	-	-	94.119	94.12

LIMITS

Per NTP Trinity's application, at maximum usage basis the facility would exceed the major source criteria pollutant threshold of 100 TPY VOC. Because of this, NTP Trinity has proposed a <100 TPY VOC SMOP limit

on the facility as a whole, which the Department will enforce as a 95 TPY limit with compliance shown by semiannual VOC usage reports.

Although the facility's potential emissions would not be expected to exceed either the 10 TPY single-species HAP or 25 TPY total HAP major source thresholds under current assumptions for maximum usage levels and product formulations, NTP Trinity has requested a <10 TPY limit on any one HAP species and a <25 TPY limit on all HAP species. The Department will implement 9.5 TPY single-species HAP limit and 24.5 TPY total HAP species SMOP limits alongside the VOC SMOP limit with compliance shown by the same semiannual report.

These facility-wide limits shown by semiannual calculations submitted to the Department would allow for operational flexibility should product formulations or usage levels vary in the future.

REGULATIONS

STATE REGULATIONS

ADEM Admin. Code r. 335-3-4-.01(1)(a)&(b) "Visible Emissions"

Each emission point will be subject to the requirements of this regulation and must not discharge particulate of an opacity greater than twenty percent (20%), as determined by a six-minute average, except that during one six-minute period in any sixty-minute period, the emission point may emit particulate of an opacity no greater than forty percent (40%). Compliance shall be determined in accordance with Method 9 of 40 CFR Part 60, Appendix A-4.

ADEM Admin. Code r. 335-3-6-.11 "Surface Coating" and 335-3-6-.01 "Applicability"

Rule 335-3-6-.11(11)(e)(1-4) applies to the coating of miscellaneous metal parts. However, because the paint line has potential less than 100 TPY and because it is not located in Mobile, Russel, or Etowah County, the exceptions in **Rule 335-3-6-.01(1)(b) & (5)** both apply, respectively. Therefore, the coating lines at NTP Trinity are not subject to this rule.

ADEM Admin. Code r. 335-3-14-.04, *"Prevention of Significant Deterioration (PSD) Permitting"*

Although Nucor Decatur is currently considered a major stationary source with respect to PSD, previous analyses from the Department considering NTP Trinity to be a part of the same stationary source as Nucor Decatur were erroneous, mistaking NTP Trinity's location for the NTP Decatur location (adjacent to the Nucor Decatur steel mill). NTP Trinity is not adjacent to Nucor Decatur and must be evaluated as a separate source.

Based on the emissions in Table 1, this facility does not exceed the 250 TPY criteria pollutant threshold required to be considered a major stationary source with respect to PSD.

ADEM Admin. Code r. 335-3-14-.06, "Determinations for Major Sources in Accordance with Clean Air Act Section 112(g)"

Because HAP emissions greater than 10 TPY of any single HAP or 25 TPY of any combination of HAPs are not expected from these sources, a 112(g) case by case MACT review would not be necessary.

ADEM Admin. Code r. 335-3-15, "Synthetic Minor Operating Permits" and ADEM Admin. Code r. 335-3-16, "Major Source Operating Permits"

Emissions from the facility, while operating at maximum expected throughput for coating and solvent usage, could exceed the major source threshold of 100 TPY unless restricted. To avoid applicability to the Title V Major Source Operating Permit program under Chapter 16, NTP Trinity has requested <100 TPY VOC, <10 TPY

HAP, and <25 TPY Total HAPs limits as shown by semiannual VOC/HAP usage reporting. The Department will impose 95 TPY VOC, 9.5 TPY HAP, and 24.5 TPY Total HAPs limits to facilitate practical enforcement with protective buffer from the regulatory thresholds. NTP Trinity does currently report VOC/HAP usage via their current Air Permit No. 712-0037-X021 under the Nucor Decatur facility number, and this requirement will not require modification when transferring to the new SMOP.

Class I Area

NTP Trinity is located within 100 km of the Sipsey Wilderness Area. However, the emissions from the proposed paint line are not expected to have a significant impact on the Class I area.

FEDERAL REGULATIONS

40 CFR 60 Subpart A, "General Provisions"

This subpart will be applicable provided that the facility is subject to one of the applicable subparts found under 40 CFR Part 60.

40 CFR 60 Subpart IIII, "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines"

40 CFR Part 60, Subpart IIII "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines" is applicable to all stationary diesel-fueled engines manufactured after 2007. The engine at NTP Trinity, which had not previously been disclosed in applications from Nucor, is a post-2007 model and is therefore subject to NSPS IIII.

Per §60.4205(b), the diesel engine must meet the NMHC+NO_X, CO, and PM standards specified in Appendix I to Part 1039 for engines of the same size range and model year. The 324 HP engine is subject to Tier 3 standards of no more than 4.0 g/hp-hr NMHC+NOX, 3.5 g/kW-hr CO, and 0.20 g/kW-hr PM.

The engine must be certified to meet the applicable emission limits [§60.4211(c)]. The engine must be installed and configured according to the manufacturer's specifications [§60.4211(a)] and must be operated and maintained according to the manufacturer's instructions [§60.4206]. The engine must be equipped with a non-resettable hour meter [§60.4209(a)]. The engine must use diesel fuel that meets the ULSD requirements of 40 CFR §1090.305 [§60.4207(b)], i.e., 15 ppm S.

To qualify as and to show compliance as an emergency engine with respect to Subpart IIII, the conditions under §60.4211(f) must be met, primarily operating less than 100 hours per calendar year during recommended maintenance and less than 50 hours per year during other non-emergency situations.

Per §60.4214(b), NTP Trinity must keep record of the engine's operating hours, time of each operation, and reason to operate (i.e., whether the engine is in emergency or nonemergency service) through a non-resettable hour meter.

40 CFR 63 Subpart A, "General Provisions"

This subpart will be applicable provided that the facility is subject to one of the applicable subparts found under 40 CFR Part 63.

40 CFR 63 Subpart T, "National Emission Standards for Halogenated Solvent Cleaning"

This regulation is applicable to any batch solvent cleaning machine that uses solvents containing greater than 5% halogenated HAPs including methylene chloride, trichloroethylene, etc. by weight. Although the solvent

used in the parts washers at NTP Trinity contains 6% naphthalene HAP by weight, this is not a halogenated HAP as specified under the rule. Therefore, this rule does not apply.

40 CFR 63 Subpart MMMM, "National Emission Standards for Hazardous Air Pollutant for Surface Coating of Miscellaneous Metal Parts and Products"

This regulation is applicable to any new, reconstructed, or existing source that uses 250 gallons per year, or more, of coatings that contain hazardous air pollutants (HAP) in the surface coating of miscellaneous metal parts or products and that is located at a major source of HAP emissions. Since this facility is not a major source of HAP emissions, this subpart would not apply.

40 CFR 63 Subpart ZZZZ – "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines"

40 CFR Part 63, Subpart ZZZZ "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines" is applicable to the engine at NTP Trinity. Per §60.6590(c)(6), NTP Trinity shows compliance with Subpart ZZZZ by meeting the requirements of Part 60 Subpart IIII as specified above.

40 CFR 63 Subpart HHHHHH, "National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources"

This subpart is applicable to certain paint-stripping and coating facilities at area sources of HAPs. Though NTP Trinity is an area source, because the paint line would not include stripping paint with methyl chloride [§63.11170(a)(1)], would not apply any coatings to motor vehicles or other mobile equipment [§63.11170(a)(2)], and would not apply coatings containing this subpart's target HAPs (Cr, Pb, Mn, Ni, & Cd) to any other equipment [§63.11170(a)(3)], this subpart is not applicable.

RECOMMENDATIONS

This analysis indicates that the proposed emission sources would meet the requirements of all federal and state rules and regulations. Based on the expected emissions from the facility, I recommend that Nucor Tubular Products – Trinity be issued Synthetic Minor Operating Permit No. 707-0028-X001 for the coating lines and other VOC emitting processes, including the proposed facility-wide SMOP limits and retaining the VOC/HAP semiannual reporting requirements from Air Permit No. 712-0037-X021, as well as Synthetic Minor Operating Permit No. 707-0028-X002 for the emergency diesel engine on site.

I also recommend that Nucor Steel Decatur LLC be informed that Air Permit No. 712-0037-X021 is rescinded and made void, with the same effective date as the issuance date for SMOP No. 707-0028-X001.

May 14, 2025
Date

R. Jackson Rogers, Jr.
Industrial Minerals Section
Energy Branch
Air Division
ADEM

Coating/Solvent/Other Material Properties

Material Description	Density (lb/gal)	Solids Content (%)	VOC Content (%)	HAP Content (%)	Xylenes Content (%)	Naphthalene Content (%)	Tolune Content (%)	Notes
Clear Coat	8.54	30.00%	11.83%	0.46%				Quakercoat 189 Clear
Black Coat	8.55	30.50%	10.30%	0.10%				Quakercoat 175 CFR Black
Black Touch-up Paint	6.46	27.00%	52.30%	13.00%	5.00%			Rustoleum Flat Black
Inspection Dye	6.49	3.00%	97.00%	70.54%	0.54%	70.00%		Radnor Penetrant
Cleaning Solvent	7.49	0.00%	100.00%					SW R6K2S
White Stenciler	11.43	40.00%	60.00%					Diagraph GS-3 White
Coolant	8.35	0.00%	15.00%					Quakercool Super Hydro 720 & 710 TP
Entry Stenciler	6.7	6.00%	94.00%	1.00%			1.00%	Diagraph TSO-3200 Black
Washing Solvent	7.9		100.00%	6.00%		6.00%		Safety Kleen, WD40
Spray Paint	5.76		88.16%	13.53%			13.41%	
Rust Preventative	8.4	0.00%	65.48%	10.00%				Resco Klear Trey Koate LO

Process Parameters

Process	Material	Application Rate (gal/hr)	Operation (hr/yr)	Operation (gal/yr)	Spray Transfer Efficiency (%)	PM Control	PM Efficiency (%)	VOC/HAP Volatilization	VOC/HAP Control	VOC/HAP Efficiency (%)
Coating Line (clear)	Clear Coat	4.9	8760	42924	65%			100%		
Coating Line (black) large	Black Coat	7.6	8760	66576	65%			100%		
Coating Line (black) small	Black Coat	7.6	8760	66576	65%	Filters	90%	100%		
Spray Touch Up	Black Touch-up Paint	0.33	8760	2890.8	65%			100%		
Spray Inspection Dye	Inspection Dye	0.16	8760	1401.6	65%			100%		
Apply Cleaning Solvent	Cleaning Solvent			1050				100%		
Spray White Stencil	White Stenciler		6240	260	65%			100%		
Spray Black Stencil	Entry Stenciler		6240	260	65%			100%		
Spray Paint Other	Spray Paint		8760	150	65%			100%		
Apply Coolant	Coolant		6240	8000				100%		
Apply Rust Preventative	Rust Preventative		6240	600				100%		
Parts Washers	Washing Solvent		8760	2160				25%		

Emissions

Process	PM lb/hr	PM TPY	VOC lb/hr	VOC TPY	HAP lb/hr	HAP TPY	Xylenes lb/hr	Xylenes Tpy	Naphthalene lb/hr	Naphthalene TPY	Toluene lb/hr	Toluene TPY
Coating Line (clear)	4.39	19.24	4.95	21.68	0.19	0.84						
Coating Line (black) large	6.94	30.38	6.69	29.32	0.06	0.28						
Coating Line (black) small	0.69	3.04	6.69	29.32	0.06	0.28						
Spray Touch Up	0.20	0.88	1.11	4.88	0.28	1.21	0.11	0.47				
Spray Inspection Dye	0.01	0.05	1.01	4.41	0.73	3.21	0.01	0.02	0.73	3.18		
Apply Cleaning Solvent	0.00	0.00	0.90	3.93	0.00	0.00						
Spray White Stencil	0.05	0.21	0.20	0.89	0.00	0.00						
Spray Black Stencil	0.00	0.02	0.19	0.82	0.00	0.01					0.00	0.01
Spray Paint Other	0.00	0.00	0.09	0.38	0.01	0.06					0.01	0.06
Apply Coolant	0.00	0.00	1.14	5.01	0.00	0.00						
Apply Rust Preventative	0.00	0.00	0.38	1.65	0.06	0.25						
Parts Washers	0.00	0.00	0.49	2.13	0.03	0.13			0.03	0.13		
Total	12.29	53.82	23.84	104.42	1.43	6.26	0.11	0.49	0.76	3.31	0.02	0.07

DATA:			
		Engine	
ENGINE TYPE	=	Diesel	
FUEL HEAT CONTENT	=	19,300	Btu/lb
FUEL S CONTENT	=	15.00	ppmm
MAXIMUM ENGINE HP	=	324	HP
ENGINE OP HOURS	=	500	Hr
ENGINE RATING	=	2.27	MMBtu/hr
BRAKE-SPECIFIC FUEL CONSUMPTION	=	7,000	Btu/ HP-hr
CALCULATION BASIS	=	Uncontrolled	

EMISSION FACTORS (EF)		MANUFACTURER'S EF			
		Uncontrolled		Controlled	
NO_X	=	2	g/HP-hr		g/HP-hr
CO	=	2.6	g/HP-hr		g/HP-hr
VOC	=	1	g/HP-hr		g/HP-hr
CH_2O	=		g/HP-hr		g/HP-hr
PM	=	0.15	g/HP-hr		g/HP-hr
CH_4	=		g/HP-hr		g/HP-hr

AP-42 Emission Factors (lb/MMBtu)

Type	PM_{filt}	PM_{con} [2]	SO_2 [1]	NO_X	CO	VOC	CH_2O	Other HAPs
Diesel	3.10E-1	2.02E-1	[By Mass]	4.41E+0	9.50E-1	3.50E-1	1.18E-3	2.69E-3
2SLB	3.84E-2	9.91E-3	5.88E-4	3.17E+0	3.86E-1	1.20E-1	5.52E-2	2.53E-2
4SLB	7.71E-5	9.91E-3	5.88E-4	4.08E+0	3.17E-1	1.18E-1	5.28E-2	2.10E-2
4SRB	9.50E-3	9.91E-3	5.88E-4	2.27E+0	3.72E+0	2.96E-2	2.05E-2	1.20E-2

40 CFR Part 98 Subpart C Greenhouse Gas Emission Factors
Tables C-1 & C-2
(kg/MMBtu)

	N_2O	CO_2	CH_4
Diesel	0.0006	75.04	0.003
NG	0.0001	53.06	0.001
LPG	0.0006	62.72	0.003
Propane	0.0006	61.46	0.003

GWP	
N_2O=	298
CO_2=	1
CH_4=	25

assume 2:1 NOX to NMHC

Uncontrolled 324 HP Engine Emissions Calculations

											Uncontrolled
$PM_{1,filt}$	0.15 g/HP-Hr	324.00 HP	1 Lb / 453.6 g	500 Hr / Year	1 Ton / 2000 Lb	0.6	PM_{filt}/PT	=	0.016 Tons/Year
PM_{con}	0.15 g/HP-Hr	324.00 HP	1 Lb / 453.6 g	500 Hr / Year	1 Ton / 2000 Lb	0.4	PM_{con}/PT	=	0.011 Tons/Year
SO_2	51.8135 lb fuel/MMBtu	2.27 MMBtu/Hr	500 Hrs / Year	1 Ton / 2000 Lb	64.08 lb SO2 / 32.06 lb S	15	ppmm S / 1000000 total ppm	=	0.00 Tons/Year
NO_X	2 g/HP-Hr	324.00 HP	1 Lb / 453.6 g	500 Hr / Year	1 Ton / 2000 Lb		S.F.	=	0.36 Tons/Year
CO	2.6 g/HP-Hr	324.00 HP	1 Lb / 453.6 g	500 Hr / Year	1 Ton / 2000 Lb		S.F.	=	0.46 Tons/Year
VOC	1.00 g/HP-Hr	324.00 HP	1 Lb / 453.6 g	500 Hr / Year	1 Ton / 2000 Lb		S.F.	=	0.18 Tons/Year
CH_2O	0.0012 lb/MMBtu	2.27 MMBtu/hr		500 Hr / Year	1 Ton / 2000 Lb		S.F.	=	0.00 Tons/Year
non-CH_2O HAPs	0.0027 lb/MMBtu	2.27 MMBtu/Hr		500 Hr / Year	1 Ton / 2000 Lb		S.F.	=	0.00 Tons/Year
CO_2	2.27 MMBtu/Hr	75.04 kg/MMBtu	0.001 Metric Ton / kg	500 Hr / Year		1.10231	Tons / 1 M Ton	=	93.80 Tons/Year
N_2O	2.27 MMBtu/Hr	0.0006 kg/MMBtu	0.001 Metric Ton / kg	500 Hr / Year		1.10231	Tons / 1 M Ton	=	0.00 Tons/Year
CH_4	2.27 MMBtu/Hr	0.003 kg/MMBtu	0.001 Metric Ton / kg	500 Hr / Year		1.10231	Tons / 1 M Ton	=	0.00 Tons/Year
Mass Sum	93.80 Tons/Year (CO_2)	+	0.0008 Tons/Year (N_2O)	+	0.0038 Tons/Year (CH_4)			=	93.81 Tons/Year
CO_2e	93.80 TPY*1 = 93.80 (CO_2)	+	0.0008 TPY*298 = 0.22 (N_2O)	+	0.004 TPY*25 = 0.09 (CH_4)			=	94.12 Tons/Year

[1] EPA AP-42 factors assume gas to have 2000 gr S/MMScf (at EPA STP). This equates to 3.44 ppmv S, assuming ideal gas. AP-42 factor can be corrected to sulfur value of facility gas by comparing actual sulfur values to EPA reference point. Assume ppmv H_2S = ppmv S (true if H_2S = TRS and TRS is entirely monosulfur compounds).

[2] EPA AP-42 Ch. 3.3 & 3.4 factors account only for filterable particulate matter. In absence of PMcon factors for engines, applying ratio of PMfilt to PMcon factors from AP-42 Ch. 1.3 (for diesel) to PMfilt factors from Ch. 3.3 & 3.4

Remetalization: mass balance based on seam/application				
	30%	assumed lost overspray		
	70.0%	transferred as zinc coating		
Seam Zn Coating L×W×T	1000000	ft/yr	wire ft/yr = tube ft/yr?	
	0.1875	inch w	0.015625	ft w
	120	um thick	0.000394	ft thick
	445.3	lb/ft3	zinc density	
	2739.296	lb/yr	transferred to tube	
	1173.984	lb/yr	lost as emissions	
uncontrolled	0.586992	TPY	uncontrolled	
	0.000587	TPY	99.9% control	

For reference only: Alternative calculations with assumed wire gauge

Remetalization: mass balance 1 mm wire			Remetalization: mass balance 4 mm wire		
30%	assumed lost overspray		30%	assumed lost overspray	
1000000	ft/yr	wire usage	1000000	ft/yr	wire usage
1	mm diam	assumption #1	4	mm diam	assumption #2
445.3	lb/ft3	zinc density	445.3	lb/ft3	zinc density
1129.364	lb/yr	uncontrolled	18069.82	lb/yr	uncontrolled
0.564682	TPY		9.034911	TPY	
0.000565	TPY	99.9% control	0.009035	TPY	99.9% control