



Air Quality Permitting Statement of Basis

August 18, 2006

Permit to Construct No. P-050111

**Diedrich Manufacturing
Ponderay, ID**

Facility ID No. 017-00052

Prepared by:

Valerie Greear, EIT
Technical Services Division

*Bill R
for*

FINAL

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Acronyms, Units, and Chemical Nomenclatures

AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
Btu	British thermal unit
CO	carbon monoxide
CR	Commercial Roaster
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
HAPs	Hazardous Air Pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
IR	In-Store Roaster
Kg	kilogram
lb/hr	pound per hour
MACT	Maximum Achievable Control Technology
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO₂	nitrogen dioxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM₁₀	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
Rules	Rules for the Control of Air Pollution in Idaho
SIP	State Implementation Plan
SM	Synthetic Minor
SO₂	sulfur dioxide
SO_x	sulfur oxides
T/yr	tons per year
µg/m³	micrograms per cubic meter
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, Rules for the Control of Air Pollution in Idaho, for issuing permits to construct.

2. FACILITY DESCRIPTION

Diedrich Manufacturing constructs coffee roasters and ancillary equipment. The commercial roasters range in size from 150,000-2,500,000 Btu/hr, and the in store coffee roasters range in size from 16,500-86,000 Btu/hr. The emissions from the facility come from testing the coffee roasters and from the paint booth. In addition to these sources, the facility also conducts metal cutting, welding, and insulation cutting.

3. FACILITY / AREA CLASSIFICATION

Diedrich Manufacturing is classified as a minor facility because their potential to emit is less than major source thresholds without requiring limits on its potential to emit. The AIRS classification is "B".

The facility is located within AQCR 63 and UTM zone 11. The facility is located in Bonner County which is designated as nonattainment for PM₁₀ and unclassifiable for CO, NO_x, SO₂, lead, and ozone.

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant at Diedrich Manufacturing. This required information is entered into the EPA AIRS database.

4. APPLICATION SCOPE

As part of the effort to bring Sandpoint area back into attainment, the Sandpoint SIP finalized in 1996 states the following:

"DEQ will evaluate all new industrial sources of PM₁₀ emissions for applicability to the *Rules* and the control strategy in this SIP. ... In PM₁₀ nonattainment areas, DEQ will consider PM₁₀ emissions from all sources associated with the facility operations. This specifically includes all fugitive emissions sources, such as material transfers, vehicle traffic and storage piles, in addition to the ducted sources of PM₁₀. ... Furthermore there shall be no "Below Regulatory Concern" (BRC) exemptions granted for any air emission generating facility in this non-attainment area." Section 5b, page V-14.

Because Diedrich Manufacturing is located within the Sandpoint SIP area, they are required to obtain a PTC.

4.1 Application Chronology

November 26, 2004	DEQ notified Diedrich Manufacturing that a PTC was required at the facility due to their being located in the Sandpoint nonattainment area.
May 3, 2005	DEQ received an application to construct an air pollution emitting facility.
June 2, 2005	DEQ sent an incompleteness letter to Diedrich Manufacturing.
June 20, 2005	DEQ received supplemental information from Diedrich Manufacturing.

June 30, 2005	DEQ put the project on the inactive backlog due to insufficient resources to process the application.
April 25, 2006	DEQ began actively processing the application.
May 25, 2006	DEQ determined the application to be complete.
July 20, 2006	DEQ sent a draft permit to Diedrich Manufacturing for review.
August 8, 2006	DEQ called Diedrich Manufacturing and learned the facility had no comments on the draft permit.

5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action.

5.1 *Equipment Listing*

Diedrich Manufacturing is a small manufacturing operation, which in 2004 manufactured and sold 12 CR roasters ranging in size from 20 to 240 kg, and 127 IR roasters ranging in size from 3 to 24 kg. The manufacturing process includes metal cutting, welding, painting, assembly, testing, and shipping.

Paint Booth

Most of the equipment is powder coated by an outside facility. At Diedrich, the roasting drum, front and back plates, duct work, and chaff collectors are painted heat black, and the gas train for the afterburner is painted yellow. There is a fiberglass filter on the paint booth with negligible PM₁₀ filter efficiency (according to the manufacturer of the FG Arrestor filter).

Coffee Roaster Testing

The coffee roasters are tested prior to shipping. On the IR roasters, 2-3 roasts are generally conducted while the roaster is adjusted, and if an afterburner was ordered it is tested separately from the roaster. On the CR roasters the equivalent of three full roasts are conducted, and generally the afterburner is tested with the roaster. The afterburner is a thermal oxidizer, and is an emissions control device for the roaster. The total amount of green coffee beans purchased in 2004 was nearly 5,000 lbs. The emissions were conservatively calculated using 10,000 lbs. of coffee beans, and half of the roasts taking place with the afterburner, and half without.

Indoor Metal Cutting, Welding, and Finishing

Some metal cutting and finishing can potentially generate emissions, including a plasma cutter, cold saw, mills, lathes, sanding, and grinding. MIG and TIG (Metal Inert Gas and Tungsten Inert Gas) welding are also conducted, and although 1700 lbs of wire were used in 2004, the emissions were conservatively calculated with an estimated 5000 lbs of 70S6 wire and 500 lbs of 309 wire.

Outdoor Preparation, Loading and Unloading

The outdoor emissions are from the cutting of insulation and lumber, and an abrasive saw and manual plasma cutter located outside.

5.2 *Emissions Inventory*

Table 5.1 summarizes the criteria pollutant and TAP annual emission rates at the facility. All emissions shown in the table are based on uncontrolled emissions, and are based on the annual usage of the equipment as submitted by the facility in the permit application. A detailed emission inventory has been included in Appendix B.

**Table 5.1 EMISSION RATE SUMMARY FOR TOXIC
AND CRITERIA POLLUTANTS LB/YR**

Emissions Unit	PM₁₀	CO	NO_x	SO₂	VOC	TAPs
Paint Booth	154.28				873.70	1094
Roaster Testing with Afterburner	0.3	1.375			0.1175	
Roaster Testing without Afterburner	1.65	3.75			3.5	
Afterburner Testing	0.285	2	4.7	0.03	0.275	
Welding	29.6					
Plasma Cutters	25.173					
Total (lb/yr)	211	7.13	4.7	0.03	877.59	1094
Total (ton/yr)	0.11	0.004	0.002	1.5x10⁻⁵	0.44	0.55

5.3 Modeling

DEQ has conducted generic PM₁₀ modeling in support of the existing modeling threshold of 0.2 lb/hr. Reasonably conservative modeling has shown that if emissions of PM₁₀ are below 0.2 lb/hr, impacts will be below the significant contribution level (5 µg/m³ for 24-hr and 1 µg/m³ for annual concentrations). Since emissions from Diedrich Manufacturing are below the 0.2 lb/hr value used in the generic modeling, DEQ is satisfied that the emissions will not cause or significantly contribute to a violation of the PM₁₀ standard.

5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201..... Permit to Construct Required

The Diedrich Manufacturing facility is located within the Sandpoint nonattainment area. The Sandpoint SIP states that, "there shall be no "Below Regulatory Concern" (BRC) exemptions granted for any air emission generating facility in this non-attainment area." Therefore, a PTC is required.

IDAPA 58.01.01.203..... Permit Requirements for New and Modified Stationary Sources

The applicant has shown to the satisfaction of DEQ that the facility will comply with all applicable emissions standards, ambient air quality standards, and toxic increments.

IDAPA 58.01.01.210..... Demonstration of Preconstruction Compliance with Toxic Standards

The applicant has demonstrated preconstruction compliance for all TAPs identified in the permit application.

IDAPA 58.01.01.224..... Permit to Construct Application Fee

The applicant satisfied the PTC application fee requirement by submitting a fee of \$1,000.00 at the time the original application was submitted, May 3, 2005.

IDAPA 58.01.01.225..... Permit to Construct Processing Fee

The total emissions from the facility are between 1 and 10 T/yr; therefore, the associated processing fee is \$2500.00. No permit to construct can be issued without first paying the required processing fee. The processing fee was received August 17, 2006.

5.5 Permit Conditions Review

Section 2 of the permit addresses the paint booth. Nearly all of the facilities emissions of HAPs, VOCs, and PM₁₀ come from paint booth activities. As such, the permit requires the facility to maintain material purchase and usage records of manufacturing-related paints and other solid containing solvents used, and the MSDS for each material. The permit requires that emissions from the paint booth be calculated

annually using the wt% solids from the MSDS and the material usage records. Also, a transfer efficiency of 40% is applicable for sprayed on paints, resulting in 60% of solids potentially emitted as PM₁₀. This transfer efficiency was selected based on AP-42 Table 4.2.2.8-2 which lists a transfer efficiency of 40% for solventborne prime coat spray, guide coat spray, and lacquer, enamel, base coat, and clear coat topcoats. A permit limit of 0.5 tons per year was allotted for the paint booth PM₁₀ emissions, to be calculated at least once per year.

Section 3 of the permit addresses the testing of coffee roasters. The facility is permitted to emit a maximum of 0.1 tons/yr PM₁₀, which is enforced by keeping records of the amount of coffee beans roasted at the facility. The emissions limit and corresponding coffee bean roasting limit was developed by using an equation from AP-42 Table 9.13.2-1, Emission Factors for Coffee Roasting Operations. The factor for filterable PM emissions from a continuous roaster without a thermal oxidizer, which was taken as the worst case scenario, was 0.66 lb/ton of green coffee beans roasted. Using this equation, a limit of 300 tons/yr of green coffee beans will ensure that the facility won't go over 0.1 ton/yr PM₁₀.

Section 4 of the permit addresses indoor metal cutting, welding, and finishing. The permit requires that emissions from stacks, vents, or other functionally equivalent openings associated with these indoor operations do not exceed 20% opacity.

Section 5 of the permit address outdoor preparation, loading and unloading, and contains conditions for the control of fugitive dust.

6. PERMIT FEES

The facility submitted the required application fee of \$1,000.00 on April 28, 2005. A processing fee of \$2,500.00 is due because the increase in emissions from the new non-major facility is between 1 tons and 10 tons per year, as outlined in Table 6.1. The processing fee was received on August 17, 2006.

Table 6.1 PTC PROCESSING FEE TABLE

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO _x	0.002	0	0.002
SO ₂	0.00002	0	0.00002
CO	0.004	0	0.004
PM ₁₀	0.11	0	0.11
VOC	0.44	0	0.44
TAPS/HAPS	0.55	0	0.55
Total:	1.1	0	1.1
Fee Due	\$2500.00		

7. PERMIT REVIEW

7.1 Regional Review of Draft Permit

DEQ's Coeur d'Alene regional office was provided the draft permit for review on June 27, 2006. Comments were received on July 19, 2006, and discussed with the regional office.

7.2 Facility Review of Draft Permit

The facility was provided the draft permit for review on July 20, 2006. The facility did not provide any comments.

7.3 Public Comment

An opportunity for public comment period on the PTC application was provided from June 9, 2006, to July 11, 2006, in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and no requests for public comment period on DEQ's proposed action.

8. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommends that Diedrich Manufacturing be issued final PTC No. P-050111 for the existing facility. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

VAG/bf Permit No. P-050111

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Appendix A

AIRS Information

P-050111

AIRS/AFS^a FACILITY-WIDE CLASSIFICATION^b DATA ENTRY FORM

Facility Name: Diedrich Manufacturing
Facility Location: Ponderay
AIRS Number: 017-00052

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO ₂	B							U
NO _x	B							U
CO	B							U
PM ₁₀	B							N
PT (Particulate)	B							U
VOC	B							U
THAP (Total HAPs)	B							U
			APPLICABLE SUBPART					

^a Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

^b AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, or each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

Appendix B

Emissions Inventory

P-050111

**Table B.1 SUMMARY OF EMISSIONS SOURCES, DESCRIPTIONS, CALCULATIONS,
AND CRITERIA POLLUTANT EMISSIONS IN LB/YR**

Source	Description	Emissions Calculation	PM ₁₀	CO	NO _x	SO ₂	VOC
Thermal Oxidizer (Afterburner)	50,000 Btu to 5,000,000 Btu	AP-42 Table 1.4-2,3, Max burned/yr 5,000 cf/hr, normal is 30,600 cfy, estimated max 50,000 cfy	0.285	2	4.7	0.03	0.275
CR Roasters - Testing	400,000-1,600,000 Btu	Estimated using AP-42 9.13.2-1,2 and 5,000 lbs green beans. 1584 lb/hr max input; 40 lb/hr 5787 lb/yr average input; 34 lb/hr 4919 lb/yr product output.	0.3	1.375			0.1175
IR Roasters - Testing	12,000-500,000 Btu; 132-580 cfm		1.65	3.75			3.5
Welding	MIG (70S6)	AP-42 Table 12.19-2 and 4, E70S	27				
	TIG (309SS)	AP-42 Table 12.19-2 and 4, E308L	2.6				
Paint Booth		See the following Tables.	154.28				873.70
Small Plasma Cutter	Mild or stainless steel (600 Plasma Torch)	Assessment of Air Emissions from Shipyard Cutting Processes, Bhaskar Kura et. al. 2000	25.173				
CNC Plasma Cutter (1250 Plasma Torch)	132 volts, 80 amps, Computerized.						
Totals in lb/yr			211.3	7.13	4.7	0.03	877.6
Totals in tons/yr			0.11	0.004	0.002	0.00002	0.44

The following tables show a breakdown of TAP emissions by compound (top) and substance used at the facility (left). At the bottom of the table are the total emissions possible at any time, and the EL associated with each TAP. All values are in lb/hr, and are based on the maximum gal/hr usage of each compound estimate submitted by the facility, and included in Table B.4.

Table B.2 TAP EMISSIONS IN LB/HR PER SUBSTANCE

	n-butyl alcohol	Ethanol	Ethyl Benzene	Methyl Isobutyl Ketone	Methyl Ethyl Ketone	Naphthalene	VM&P Naptha	1,2,4-Trimethyl benzene	Toluene	Xylene
Lacquer Thinner	0.006	0.003	0.010	0.021	0.021				0.031	0.005
Krylon int-ext/KR and Hi Heat	0.017		0.017	0.034	0.111					0.085
928B Series Binder			0.048							0.226
EP210 Epoxy Primer										0.073
EX 655 Epoxy Catalyst				0.500						1.369
S9860 Fast Urethane Reducer										
S9870 Medium Urethane Reducer					0.552					
Thinner 100X										1.805
Thurmalox 245 Zinc Primer			0.166					0.281	0.166	3.497
Thurmalox Black	0.139	0.104	0.138						2.027	1.987
Thurmalox Clear Laquer	0.136		0.035						1.431	1.503
Valve Action Paint Marker			0.025				0.147			0.046
700 Series Acrylic Enamel			0.345		0.276				0.828	1.173
8022S Enamel Reducer			0.009			0.008			0.178	0.019
Isocyanate Activators 793S								0.011	0.045	
Variprime 615S	0.097			0.341					0.730	
Variprime 616S Activator	2.043								0.146	
99A Acrylic Enamel			0.168		0.240	0.012			1.140	0.780
EL, lb/hr	10	125	29	13.7	39.3	3.33	91.3	8.2	25	29
Total, lb/hr	2.436	0.107	0.961	0.895	1.200	0.020	0.147	0.292	6.722	12.567

Table B.3 LACQUER THINNER TAP EMISSIONS

	Acetic Acid	n-butyl acetate	Isobutyl Acetate	Isopropyl Acetate	Methanol	Methyl n-amyl Ketone	Methyl Propyl Ketone	Methylene Chloride	Perchloroethylene
Lacquer Thinner	0.01	0.01	0.01	0.01	0.001	0.02	0.02	0.0003	0.0003
EL, lb/hr	1.67	47.30	46.70	69.30	17.30	15.70	46.70	0.0016	0.0130
Total, lb/hr	0.01	0.01	0.01	0.01	0.001	0.02	0.02	0.0003	0.0003

The following table is included to show the percentage of the chemical materials used at the facility that are VOC and solids, based on the weight percent from the MSDS'. The maximum usage in yearly and daily totals was submitted by the facility in their application. The lb/hr and lb/yr emissions were calculated by multiplying the wt% VOC and solid in the MSDS by the respective usage in per hour and per year. Solids in the compounds were taken to be

Table B.4 MAXIMUM USAGE AND MAXIMUM VOC AND PM₁₀ EMISSIONS FROM THE PAINT BOOTH

	Max Yearly Usage lb/yr	Max Daily Usage lb/hr	Wt% Solids	Wt% Volatile Compounds	Maximum VOC Emissions		Solid Transfer Efficiency, AP-42 Table 4.2.2.8-2	Maximum PM ₁₀ Emissions	
					lb/hr	lb/yr		lb/hr	lb/yr
Lacquer Thinner	345.0	0.07	0%	100%	0.07	345.00	0%	0	0
Krylon int-ext/KR and Hi Heat	68.0	0.85	48%	52%	0.44	35.36	40%	0.24	19.58
928B Series Binder	43.0	4.30	43%	57%	4.88	24.40	40%	1.12	11.16
EP210 Epoxy Primer	61.9	6.19	85%	15%	0.92	9.20	40%	3.16	31.62
EX 655 Epoxy Catalyst	40.4	4.04	100%	0%	0.00	0.00	40%	2.42	24.21
S9860 Fast Urethane Reducer	33.6	3.36	0%	100%	3.36	33.55	0%	0	0
S9870 Medium Urethane Reducer	35.7	1.79	0%	100%	1.79	35.70	0%	0	0
Thinner 100X	36.1	1.81	0%	100%	1.81	36.10	0%	0	0
Thurmalox 245 Zinc Primer	48.7	9.74	52%	48%	4.69	23.47	40%	3.03	15.14
Thurmalox Black	85.8	6.44	31%	69%	4.43	59.12	40%	1.20	16.01
Thurmalox Clear Lacquer	38.0	3.80	19%	81%	3.08	30.78	40%	0.43	4.33
Valve Action Paint Marker	33.5	0.84	20%	80%	0.67	26.80	100%	0	0
700 Series Acrylic Enamel	46.0	6.90	14%	86%	5.95	39.65	40%	0.57	3.81
8022S Enamel Reducer	75.0	1.65	0%	100%	1.65	75.00	0%	0	0
Isocyanate Activators 793S	9.1	1.14	79%	21%	0.24	1.93	40%	0.54	4.30
Variprime 615S	48.7	4.87	46%	54%	2.61	26.12	40%	1.35	13.52
Variprime 616S Activator	48.7	4.87	2%	98%	4.78	47.84	0%	0.08	0.81
99A Acrylic Enamel	40.0	6.00	41%	59%	3.55	23.67	40%	1.47	9.80
					VOC ton/yr			PM ₁₀ ton/yr	
					VOC lb/yr			PM ₁₀ lb/yr	
					0.44			0.08	
					873.70			154.28	

^aMaximum lb/hr estimates calculated using the facility supplied maximum gal/hr usage.
^bMaximum lb/yr and ton/yr estimates calculated using the facility supplied gal/yr usage of chemicals.
Solids and VOCs calculated using percentage VOC and Solid from MSDS.