EI-CP1
EI-CP2

DEQ AIR QUALITY PROGRAM
1410 N. Hilton
Boise, ID 83706
For assistance: (208) 373-0502

PERMIT TO CONSTRUCT APPLICATION

Company Name:	Biopol Laboratory, Inc.
Facility Name:	Post Falls Facility
Facility ID No.:	N.A. -- new facility
Brief Project Description:	Construction of Allergen Purification Facility

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - POINT SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	Stack ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Point Source(s)													
HB-1 Boiler	S-1	0.05	0.20	0.00	0.02	0.30	1.30	0.50	2.20	0.03	0.14	N.A.	N.A.
HB-2 Boiler	S-2	0.05	0.20	0.00	0.02	0.30	1.30	0.50	2.20	0.03	0.14		
HB-3 Boiler	S-3	0.05	0.20	0.00	0.02	0.30	1.30	0.50	2.20	0.03	0.14		
HB-4 Boiler	S-4	0.05	0.20	0.00	0.02	0.30	1.30	0.50	2.20	0.03	0.14		
SB-2 Boiler	S-5	0.02	0.08	0.00	0.01	0.12	0.50	0.20	0.90	0.01	0.06		
CU-3 Generator	S-6	0.44	0.11	0.49	0.12	12.36	3.09	7.71	1.93	1.74	0.44		
AHU-1	S-8	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.00	0.00		
AHU-2	S-9	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00		
AHU-3	S-10	0.05	0.02	0.00	0.00	0.03	0.15	0.06	0.02	0.00	0.02		
AHU-4	S-11	0.00	0.02	0.00	0.00	0.03	0.13	0.05	0.02	0.00	0.01		
AHU-6	S-13	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.03	0.00	0.00		
AHU-7	S-14	0.00	0.02	0.00	0.00	0.03	0.13	0.05	0.22	0.00	0.01		
AHU-8	S-16	0.00	0.02	0.00	0.00	0.03	0.13	0.05	0.22	0.00	0.01		
AHU-9	S-17	0.00	0.02	0.00	0.00	0.03	0.13	0.05	0.22	0.00	0.01		
AHU-10	S-18	0.01	0.03	0.00	0.00	0.05	0.22	0.09	0.37	0.01	0.02		
AHU-11	S-19	0.01	0.02	0.00	0.00	0.03	0.15	0.06	0.25	0.00	0.02		
T-21	S-21	0.43	1.88										
T-37	S-35	0.04	0.19										
B-30	S-30	0.43	1.88										
B-36	S-32	0.04	0.19										
R-27	S-27	0.43	1.88										
R-39	S-29	0.04	0.19										
SM-40	S-24	0.11	0.47										
SM-38	S-26	0.26	0.11										
A-5	S-36	0.04	0.19										
B-31	S-31	0.04	0.19										

R-28	S-28	0.04	0.19										
T-22	S-22	0.04	0.19										
SM-25	S-25	0.04	0.19										
P-1	S-7 & S12	1.23	5.39							1.11	0.40		
P-2	S-15	0.43	1.88							0.08	0.10		
SM-23	S-23									4.73	6.14		
B-34 (No VOCs, TAPs only)	S-34												
R-33 (No VOCs, TAPs only)	S-33												
T-20 (No VOCs, TAPs only)	S-20												
Total[a]		**4.38**	**16.17**	**0.51**	**0.23**	**13.93**	**9.87**	**10.33**	**13.02**	**7.82**	**7.82**		

[a] **See Attachment 4 for proposed emission limits**

DEQ AIR QUALITY PROGRAM 1410 N. Hilton Boise, ID 83706 For assistance: (208) 373-0502	**PERMIT TO CONSTRUCT APPLICATION**

Company Name:	Biopol Laboratory, Inc.
Facility Name:	Post Falls Facility
Facility ID No.:	N.A. -- new facility
Brief Project Description:	Construction of Allergen Purification Facility

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - FUGITIVE SOURCES

		3.											
1.	2.	PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	Fugitive ID	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Fugitive Source(s)													
N.A. -- no fugitive sources													
Total													

Plot Plan

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 1
01/11/07

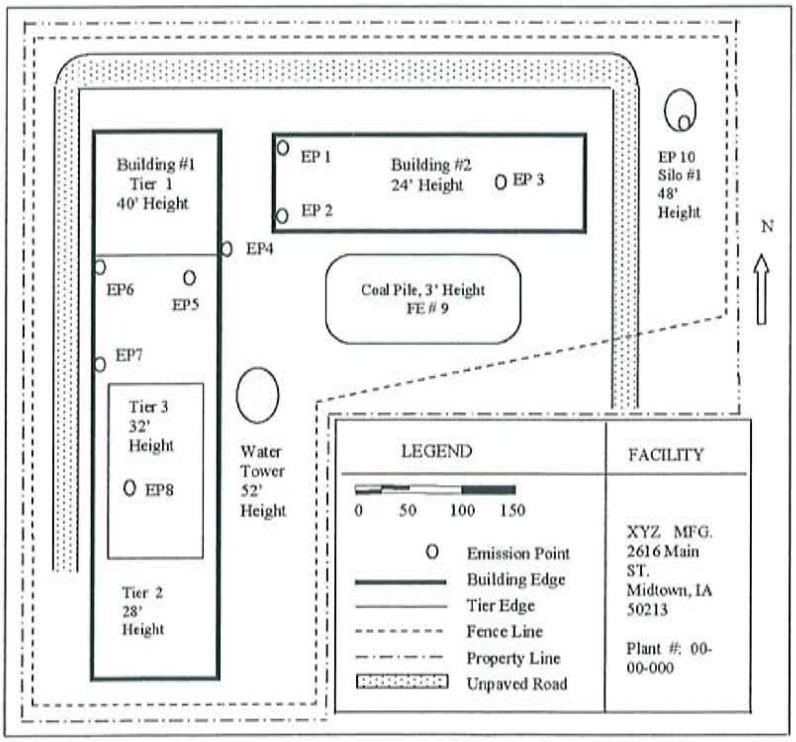
PLOT PLAN REQUIREMENTS

A scaled plot plan of the entire plant is required with your permit application. The plot plan must show:

1. A scale bar and a north arrow. The scale must be of sufficient size to allow drawings to be converted to electronic format.
2. Property lines.
3. If any, fence lines or any physical barriers precluding the public access.
4. Locations of all buildings **within the property lines**. Locations of tiers on multi-level buildings. Include the building and structure heights, and tier heights. A description of the buildings or structures is optional.
5. Locations of **ALL** emission points. Emission point symbols need not be to scale.
6. Locations of all structures **above ground level** and **within property lines**. Structures **above ground level** such as a gasoline storage tank, grain storage silos, etc., must be shown. Structures **at ground level,** such as concrete pads, paved parking lots, etc., should **not** be on the plot plan.
7. Locations of unpaved roads (need not be to scale) and area sources, such as coal piles must be shown, only if fugitive emissions must be included in the permit application.
8. Highlight or mark the emission point that is the subject of this permit application so that it is clearly distinguished from other emission points or labels on the plot plan.

- **All buildings and structures above ground level and all emission points must be marked with identification numbers, which MUST be consistent with all forms in the application.**
- AutoCAD or equivalent computer-aid drawings on paper and on disk are preferred.
- Sketches are acceptable.
- Aerial photographs are not acceptable.

SAMPLE PLOT PLAN



See attached plot plan

4/24/07
Large document in source file

...PRODUCED IN ANY MANNER WITHOUT WRITTEN PERMISSION OF INTEGRATED PROJECT SERVICES.

CLIENT

N:\2006\06380-1\B. PROJECT DESIGN DATA\B.09 Project Drawings\Arch\Biopol-scheme4-1-rvt-biopollogo-950925.jpg

BIOPOL LABORATORY, INC. IDAHO PROJECT

DRAWING TITLE

OVERALL SITE PLAN

SEAL

ENGINEER	ARCHITECT	DESIGNER
	SRF	SRF
DRAWN BY	REVIEWED BY	SCALE
SRF	ET/SRF	1" = 60'-0"

RECORDS CONTROL

IPS #

CADD FILE #

XREF FILE(S)

DRAWING NUMBER

A1.04

M1-1, M1-2,
M1-4

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the Air Permit **Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 2 2/14/2007

Company Name:	**Biopol Laboratory, Inc.**
Facility Name:	**Post Falls Facility**
Facility ID No.:	**N.A. -- new facility**
Brief Project Description:	**Construction of Allergen Purification Facility**

Please see instructions on next page before filling out the form.

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

		1.		2.	3.	4.		5.
Criteria Pollutants	**Averaging Period**	**Significant Impact Analysis Results (µg/m3)**	**Significant Contribution Level (µg/m3)**	**Full Impact Analysis Results (µg/m3)**	**Background Concentration (µg/m3)**	**Total Ambient Impact (µg/m3)**	**NAAQS (µg/m3)**	**Percent of NAAQS**
PM_{10}	24-hour	**NA**	5	**60.70**	**67.00**	**127.70**	150	**85%**
	Annual	**NA**	1	**12.68**	**23.70**	**36.38**	50	**73%**
SO_2	3-hr	**NA**	25	**NA**	**NA**	**NA**	1300	**NA**
	24-hr	**NA**	5	**NA**	**NA**	**NA**	365	**NA**
	Annual	**NA**	1	**NA**	**NA**	**NA**	80	**NA**
NO_2	Annual	**NA**	1	**10.64**	**32.00**	**42.64**	100	**43%**
CO	1-hr	**NA**	2000	**NA**	**NA**	**NA**	10000	**NA**
	8-hr	**NA**	500	**NA**	**NA**	**NA**	40000	**NA**

Instructions for Form MI1

This form is designed to provide the air quality modeler with a summary of the air impact anlaysis results for the criteria pollutants. This information will be used by IDEQ to determine compliance demonstration with the national ambient air quality standards (NAAQS).

Please fill in the same company name, facility name, facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

Significant Impact Analysis - evaluates the emissions increase from the proposed project only. This analysis determines whether or not a proposed project has a significant impact on ambient air, and therefore, requiring a full impact analysis.

Full Impact Analysis - Only required if the signicant impact analysis exceeds the significant contribution level - evaluates the emissions from the facility, including the emissions increase from the proposed project. This analysis determines whether the facility, with the emissions increase, comply with the NAAQS.

1. Provide the results of the significant impact analysis in $\mu g/m^3$.
2. Provide the results of the full impact analysis in $\mu g/m^3$ (if required).
3. List the background concentration, in $\mu g/m^3$. Contact the Stationary Source Modeling Coordinator at (208) 373-0502 for the current background concentrations for the area of interest. (not needed if full impact analysis is not required)
4. Provide the total ambient impact in $\mu g/m^3$. The total ambient impact is the sum of the background concentration and the full impact analysis result.
5. Calculate the percent of the NAAQS that the total ambient impact analysis represents.

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the Air Permit Hotline - 1-877-5PERMIT	**PERMIT TO CONSTRUCT APPLICATION** Revision 2 2/14/2007
Company Name:	Biopol Laboratory, Inc.	
Facility Name:	Post Falls Facility	
Facility ID No.:	N.A. -- new facility	
Brief Project Description:	Construction of Allergen Purification Facility	

Please see instructions on next page before filling out the form.

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	.7	8.	9.	10.
Emissions units	Stack ID	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Modeled Diameter (m)	Stack Exit Temperature (K)	Stack Exit Flowrate (acfm)	Stack Exit Velocity (m/s)	Stack orientation (e.g., horizontal, rain cap)
Point Source(s)										
USM Inoculation area air handling	S-8	499,701.30	5,283,124.90	641.29	10.36	0.24	294.26	1,500.00	15.24	Vertical, no cap
USM Process/support air handling	S-9	499,703.10	5,283,120.30	641.23	10.36	0.41	294.26	4,250.00	15.24	Vertical, no cap
SSM Pollen Lab air handling unit	S-10	499,664.80	5,283,101.00	642.51	10.36	0.98	294.26	24,500.00	15.24	Vertical, no cap
Process Development/QC Labs air	S-11	499,698.90	5,283,128.20	641.37	10.36	0.89	294.26	20,000.00	15.24	Vertical, no cap
Administration air handling unit	S-13	499,687.20	5,283,135.30	641.76	10.36	0.77	294.26	15,000.00	15.24	Vertical, no cap
Timothy Pollen building air handlir	S-14	499,685.70	5,283,089.20	641.81	13.72	0.91	294.26	21,000.00	15.24	Vertical, no cap
Ragweed Building air handling uni	S-16	499,689.50	5,283,079.10	641.68	13.72	0.91	294.26	21,000.00	15.24	Vertical, no cap
Birch Building air handling unit (fu	S-17	499,692.50	5,283,071.00	641.58	13.72	0.91	294.26	21,000.00	15.24	Vertical, no cap
Spanish Mites air handling unit (fut	S-18	499,724.80	5,283,080.60	640.51	7.32	0.98	294.26	24,250.00	15.24	Vertical, no cap
SSM Expansion air handling unit (f	S-19	499,734.80	5,283,061.80	640.17	14.33	0.98	294.26	24,500.00	15.24	Vertical, no cap
Natural gas fired boilers (125 bhp)	S-1	499,681.80	5,283,098.70	641.94	10.36	0.30	480.37	1,810.00	11.71	Vertical, no cap
Natural gas fired boiler (50 BHP) (f	S-5	499,687.00	5,283,101.70	641.77	10.36	0.30	474.26	746.00	4.83	Vertical, no cap
Emergency generator (1000 kw)	S-6	499,719.80	5,283,111.80	640.67	3.66	0.30	797.04	7,771.00	50.29	Vertical, no cap
US Mite SSM-2009 (exhaust hoods)	S-12	499,711.90	5,283,133.90	640.94	10.36	0.30	294.26	2,000.00	15.24	Vertical, no cap
SSM Building exhaust	S-7	499,710.70	5,283,136.50	640.98	10.36	0.73	294.26	13,570.00	15.24	Vertical, no cap
Process Development Hoods	S-15	499,713.20	5,283,131.40	640.89	10.36	0.61	294.26	9,850.00	15.24	Vertical, no cap
Timothy Building fluid bed dryer	S-21	499,691.20	5,283,092.10	641.63	13.72	0.46	294.26	5,000.00	15.24	Vertical, no cap
Timothy Building vacuum cleaner	S-22	499,693.70	5,283,093.10	641.54	13.72	0.15	294.26	500.00	15.24	Vertical, no cap
Timothy Building pneumatic vent	S-35	499,695.80	5,283,094.40	641.47	13.72	0.15	294.26	500.00	15.24	Vertical, no cap
Spanish Mite Building media prep	S-24	499,733.80	5,283,091.30	640.21	7.32	0.22	294.26	1,250.00	15.24	Vertical, no cap
Spanish Mite Building vacuum clea	S-25	499,735.10	5,283,089.30	640.16	7.32	0.15	294.26	500.00	15.24	Vertical, no cap
Spanish Mite Building pneumatic v	S-26	499,736.10	5,283,087.40	640.13	7.32	0.34	294.26	3,000.00	15.24	Vertical, no cap
Ragweed Building fluid bed dryer	S-27	499,693.20	5,283,080.70	641.56	13.72	0.46	294.26	5,000.00	15.24	Vertical, no cap
Ragweed Building vacuum cleaner	S-28	499,694.80	5,283,081.70	641.51	13.72	0.15	294.26	500.00	15.24	Vertical, no cap
Ragweed Building pneumatic vent	S-29	499,697.40	5,283,083.40	641.42	13.72	0.15	294..26	500.00	15.24	Vertical, no cap

Birch Building fluid bed dryer	S-30	499,696.80	5,283,073.50	641.44	13.72	0.46	294.26	5,000.00	15.24	Vertical, no cap
Birch Building vacuum cleaner	S-31	499,698.50	5,283,074.10	641.38	13.72	0.15	294.26	500.00	15.24	Vertical, no cap
Birch Building pneumatic vent	S-32	499,700.50	5,283,075.10	641.32	13.72	0.15	294.26	500.00	15.24	Vertical, no cap
(insert more rows as needed)										

Instructions for Form MI2

This form is designed to provide the air quality modeler with information on the stack characteristics of each point source located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the name of the emission unit. This name should match names on other submittals to IDEQ and within this application.
2. Provide the identification number for the stack which the emission unit exits.
3. Provide the UTM locations for each point source. The UTM Easting and UTM Northing are the coordinates are for the center of the point source.
4. Provide the elevation of the base of the stack. This elevation must be calculated by the same method as the buildings and receptor elevation.
5. Provide the height of the stack, from the ground.
6. Provide the stack diameter that is included in the modeling analysis. Refer to the State of Idaho Modeling Guideline for guidance on developing the appropriate diameter.
7. Provide the stack exit temperature. Include documentation and justification for the exit temperature used.
8. Provide the stack exit flowrate. Include documentation and justification for the exit flowrate used.
9. Provide the stack exit velocity. Include documentation and justification for the exit velocity used.
10. Provide the orientation of the stack (horizontal or vertical). Indicate whether there is an obstruction on the stack, such as a raincap.

DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the Air Permit **Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 2 2/14/2007
Company Name:	**Biopol Laboratory, Inc.**
Facility Name:	**Post Falls Facility**
Facility ID No.:	**N.A. -- new facility**
Brief Project Description:	**Construction of Allergen Purification Facility**

Please see instructions on next page before filling out the form.

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	Length (ft)	Width (ft)	Base Elevation (m)	Building Height (m)	Number of Tiers	Description/Comments
Small Scale Manufacturing	102.00	91.00	NA	5.49	1	
QA/QC Product Development	112.00	59.00	NA	5.49	1	
Warehouse	148.00	97.00	643.13	8.84	1	
Central Utility	125.00	35.00	642.21	8.84	1	
Administration	137.00	58.00	NA	12.19	1	
Timothy Pollen	87.00	34.00	642.21	12.19	1	
Main Building	113.00	103.00	641.60	8.84	1	
Ragweed	87.00	34.00	642.21	12.19	1	
Birchwood	87.00	34.00	641.91	12.19	1	
Spanish Mites	106.00	103.00	640.99	5.79	1	
Spanish Mites (future)	103.00	76.00	640.69	5.79	1	

This form is designed to provide the air quality modeler with information on the buildings and structures located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the building ID number.
2. Provide the length of the building.
3. Provide the width of the building.
4. Provide the base elevation of the building. This elevation must be calculated by the same method as the sources and receptor elevation.
5. Provide the height of the building, from the ground.
6. Provide the number of tiers on the building. Refer to the State of Idaho Modeling Guideline for guidance on this topic.
7. Provide a description of the building.

FRA

Federal Requirements Applicability **FORM FRA**

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 1
01/11/07

Please see instructions on page2 before filling out the form.

IDENTIFICATION		
Company Name: **Biopol Laboratory, Inc.**	Facility Name: **Post Falls Facility**	Facility ID No: **N.A. – new facility**
Brief Project Description: **Construction of Allergen Purification Facility**		

APPLICABILITY DETERMINATION		
1. Will this project be subject to 1990 CAA Section 112(g)? (Case-by-Case MACT)	☒ NO	☐ YES*
	* If YES then applicant must submit an application for a case-by-case MACT determination [IAC 567 22-1(3)"b" (8)]	
2. Will this project be subject to a New Source Performance Standard? (40 CFR part 60)	☐ NO	☒ YES*
	*If YES please identify sub-part: **Subpart IIII, Compression Ignition Stationary Internal Combustion Engines**	
3. Will this project be subject to a MACT (Maximum Achievable Control Technology) regulation? (40 CFR part 63)	☒ NO	☐ YES*
THIS ONLY APPLIES IF THE PROJECT EMITS A HAZARDOUS AIR POLLUTANT	*If YES please identify sub-part: ____	
4. Will this project be subject to a NESHAP (National Emission Standards for Hazardous Air Pollutants) regulation? (40 CFR part 61)	☒ NO	☐ YES*
	*If YES please identify sub-part: ____	
5. Will this project be subject to PSD (Prevention of Significant Deterioration)? (40 CFR section 52.21)	☒ NO	☐ YES
6. Was netting done for this project to avoid PSD?	☒ NO	☐ YES*
	*If YES please attach netting calculations	

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS CALL THE AIR PERMIT HOTLINE AT 877-5PERMIT

Attachment 1

ATTACHMENT 1

PROCESS DESCRIPTION

ATTACHMENT 1.0
PROJECT DESCRIPTION

1.1 PROJECT BACKGROUND

1.2 PROCESS DESCRIPTION

1.2.1 Pollen Processing
1.2.2 Small Scale Manufacturing and U.S. Mites Processing
1.2.3 Spanish Mites Processing
1.2.4 Process Development/Quality Control Laboratory
1.2.5 House Vacuum Systems
1.2.6 Boilers
1.2.7Electric Generator
1.2.8 Air Handling Units

1.3 CONSTRUCTION SCHEDULE

FIGURES

Figure 1-1 Timothy Pollen Flow Diagram
Figure 1-2 Small Scale Manufacturing Flow Diagram
Figure 1-3 U.S. Dust Mites Flow Diagram

1.0 PROJECT DESCRIPTION

1.1 PROJECT BACKGROUND

Biopol Laboratory, Inc. (Biopol) is proposing to construct an allergen vaccine purification facility in an industrial park on Lochsa Street in Post Falls, Idaho. The plan is to construct a facility that will receive and purify harvested pollen from timothy, birch, and ragweed for further processing elsewhere to produce a vaccine for individuals with pollen allergies. A second process at the facility will involve the purification of U. S. dust mites for similar processing into a vaccine at other facilities.

The facility will include the following buildings:

- Administration/Small Scale Manufacturing
- Timothy Pollen Processing
- Product Development/Quality Control Laboratory
- Central Utility Plant (C.U.P.)
- Warehouse

The facility will be a minor source of air pollutant emissions, for which the appropriate permit is a Permit to Construct, pursuant to IDAPA 58.01.01.200. To obtain the maximum operating flexibility in the future, Biopol is requesting a Facility Emission Cap (FEC) permit, pursuant to IDAPA 58.01.01.176-181. During later phases of the project (tentatively targeted for the 3rd quarter of 2008), additional buildings will be constructed for the processing of Birch Pollen, Ragweed Pollen, and Spanish Mites.

The primary function of the facility is to purify allergens in the Timothy Pollen Processing Building and the Administration Building, which will house Small Scale Manufacturing, U.S. Mites production, and the Process Development/Quality Control Laboratory. Equipment supporting these operations will ultimately include five boilers, an electric generator, 11 rooftop air handling units, and five house vacuum systems.

Emission control equipment includes high efficiency particulate air (HEPA) filters on the two fluidized bed dryers and the pan dryer in the PD Lab, the fluidized bed dryers/separators in the Timothy, Birch, and Ragweed Pollen Processing Buildings, and vent condensers on the filter dryers (de-fatting operation) in the Timothy, Birch, and Ragweed Pollen Processing Buildings. All facility emission rates are below the applicability thresholds of the PSD and non-attainment New Source Review programs.

1.2 PROCESS DESCRIPTION

1.2.1 Pollen Processing

Pollen is collected from pure fields of *Phleum pratense*. The collected material is transported into the Post Falls facility where it is purified and dried using air and mechanical based methods. The purified pollen is stored until it is ready to be processed.

Processing involves suspending 1 part pollen in 2 parts acetone by volume in a closed system which may or may not be circulated through a closed sieve. After the prescribed amount of time in the acetone, the acetone is separated from the pollen by filtration and collected. The pollen is further dried to remove water and residual acetone. The residual acetone that is removed is collected in a vapor condenser.

The dry processed pollen powder is then packaged and stored until ready for shipment.

Figure 1-1 presents a general process flow diagram for the Timothy Pollen Processing Building. It should be noted that the pollen collection and de-haying operations take place in the field, not at the Post Falls facility. The same equipment and processing methods will apply to the Birch and Ragweed Buildings.

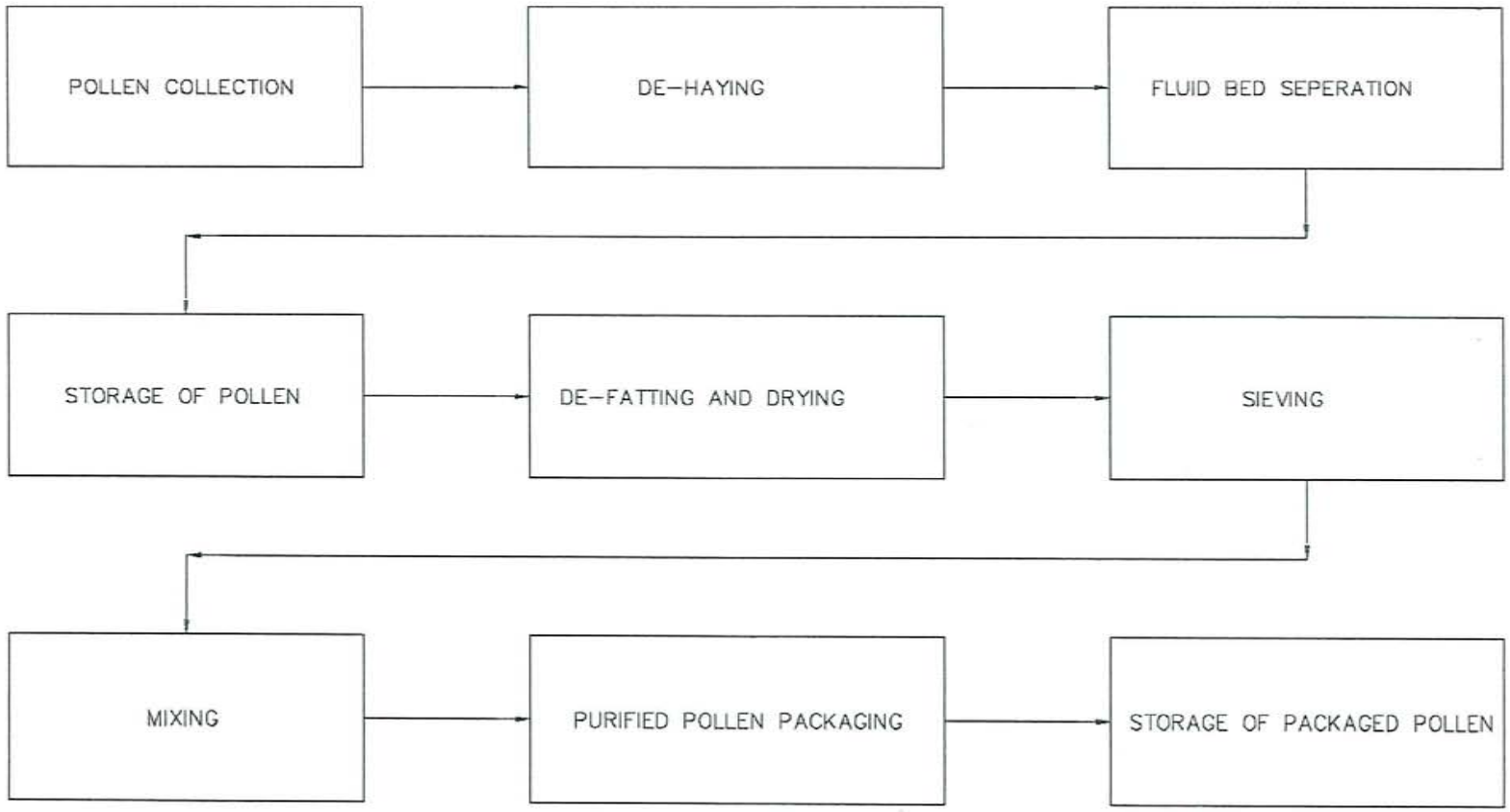
1.2.2 Small Scale Manufacturing and U.S. Mites Processing

Small Scale Manufacturing includes the small scale production facility for growing and processing U.S. Mites, as well as the processing for all other allergens that do not have an independent production facility. These include pollens, rusts, smuts, foods, insects, animal epidermal products, certain concentrated allergens, and various other environmental products. Activities included in allergen processing include grinding, sieving, defatting with acetone, ambient drying, vacuum drying, freeze drying, dialysis, filtration, and infrequently, cleaning with perchloroethylene. Solvents used in the non-mite processing conducted in the SSM area include acetone used for defatting, isopropyl alcohol used for equipment cleaning and disinfection, and perchloroethylene used for cleaning pollens which cannot be cleaned by mechanical means. Figure 1-2 presents a flow diagram of the Small Scale Manufacturing process.

The U.S. Mite processing area uses ethyl alcohol to clean and purify the mite product. The ethyl alcohol used is denatured with 5 percent methanol.

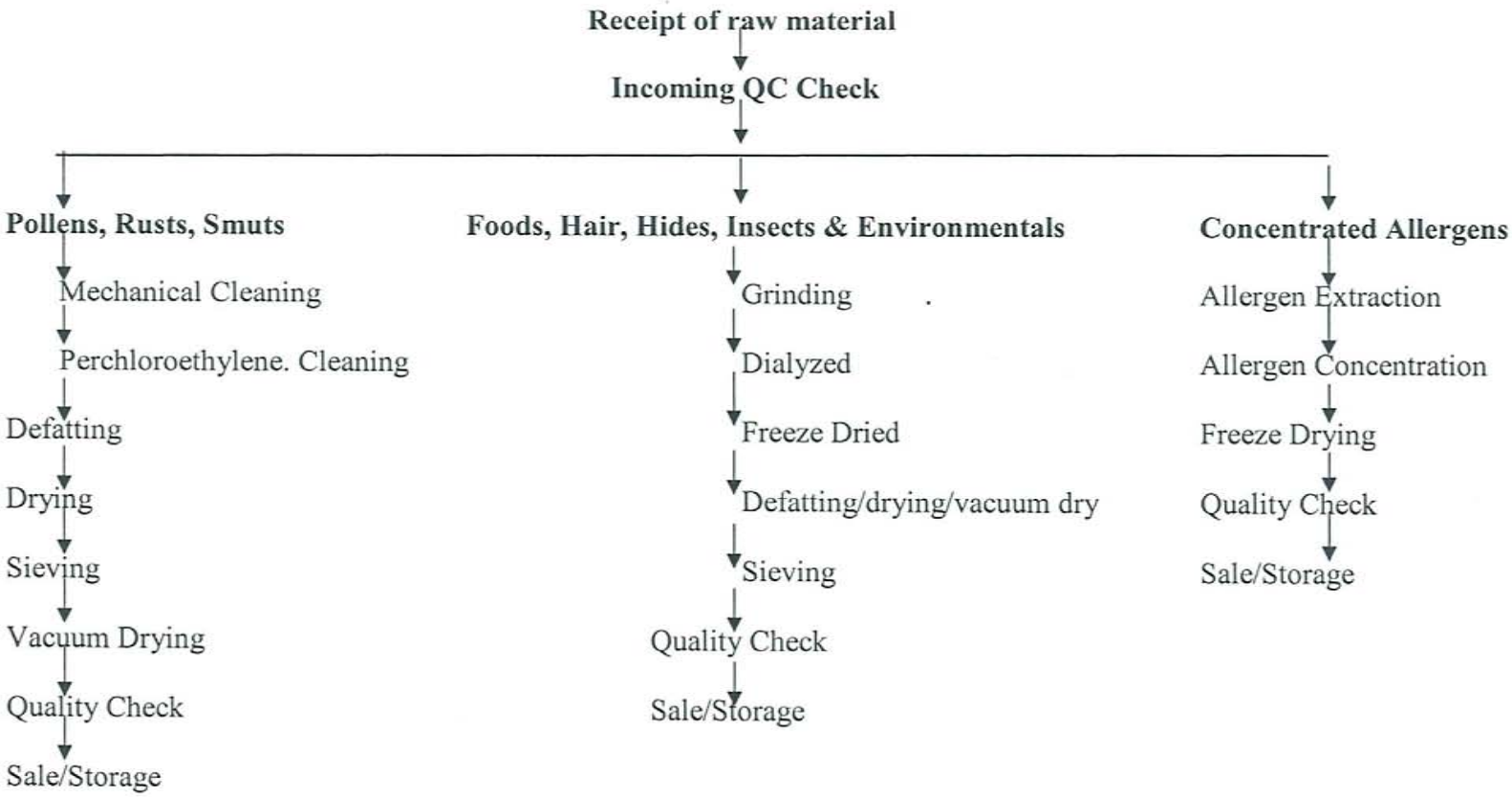
Figure 1-3 presents a general process flow diagram for the proposed U.S. dust mite processing operations, which will be conducted in the Small Scale Manufacturing Building. Here, the mites will be grown, killed, and purified on a lab-scale or pilot-scale basis. A section of this building will house the formulation, blending, and drying of the media that is used to feed the mites during their inoculation and incubation/cultivation stages. In the United States dust mite process, mites are cultured in a controlled environment. The mites are then killed in a freezer. Next, the mites are purified using physical and chemical means. The purified mites are run through a quality control check and stored. The dry product will be stored and shipped to Denmark for vaccine manufacture.

Figure 1-1. Timothy Pollen Process Flow Diagram



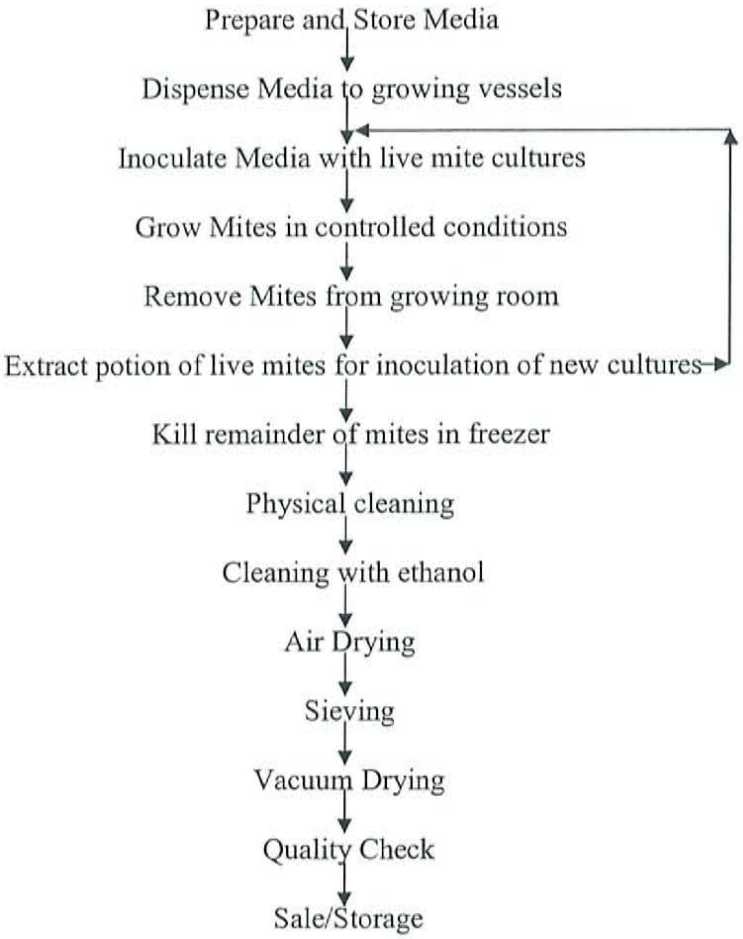
TIMOTHY PROCESS – BLOCK DIAGRAM

Figure 1-2. Biopol Small Scale Manufacturing Process Flow Diagram



Note: Steps offset in flow are only performed some of the time.

Figure 1-3. U.S. Mites Flow Chart



1.2.3 Spanish Mites Processing

The Spanish Mites production process will be similar in concept to the U.S. Mites process but larger in scale. The process will involve media preparation, mites inoculation, growth, killing, and washing. Potential process equipment includes a Pan Dryer, Wet Sieve, a Solvent Recovery Still and/or a Fluid Bed Dryer. Solvent handling will be served by a vent condenser to reduce ethanol emissions. The Media Prep Room and Pneumatic Conveyor Release Vent will be served by a HEPA filter to reduce particulate emissions.

1.2.4 Process Development/Quality Control Laboratory

The QC and PD labs share some workspace and emission points. The QC labs will conduct chemical and physical testing on incoming, in process, and final products. They will use the normal laboratory chemicals including acids, bases, solvents, and reagents but in lab scale quantities. All chemical emissions will exit through laboratory fume hoods. Emissions of acetone, ethanol, methanol, and isopropyl alcohol will be measured and included with all other plant emissions as the emissions of these solvents are calculated as the difference between purchased and recovered quantities.

The PD lab will process pilot plant scale quantities of acetone, ethanol and methanol in the development of future plant scale processes and equipment. Emissions from this area are all collected by the laboratory fume hood collection system and will be intermittent. Equipment will include two pilot scale fluid bed dryers, one pan or filter dryers, sieving and other mechanical cleaning equipment. The two fluid bed dryers and the pan dryer will be served by separate HEPA filters for particulate removal.

1.2.5 House Vacuum Systems

The facility will include five identical portable Spencer, vacuum systems (Industravac B-series, or equivalent) for housekeeping purposes – one each in the Administration Building, Timothy Pollen Building, Birch Pollen Building, Ragweed Pollen Building, and Spanish Mites Building. Each unit will contain 19 nylon filter bags with a total filter area of 75 square feet. The rated air flow for each unit is 500 scfm; they will operate at a vacuum of 8.4 inches of mercury.

1.2.6 Boilers

The facility will include five boilers – (i) four 125-hp, fire-tube, natural gas-fired package boilers (State SBN85310NE, or equivalent), and (ii) a 50 hp fire-tube, natural gas-fired package boiler (Cleaver-Brooks Model CBR, or equivalent). The rated heat input for each of the 125-hp boilers is 6.25 MMBTU/hr; maximum natural gas consumption is 5,952 cubic feet per hour. The 50-hp boiler has a rated heat input of 2.5 MMBTU/hr and will burn 2,381 cubic feet of natural gas per hour. The boilers will be equipped with low-NO_x burners. They will be located in the Central Utility Plant (C.U.P.), will be used exclusively to satisfy space heating needs, and will generate

hot water, not steam. The stacks for all five boilers will be 12 inches in diameter and will discharge 39 feet above grade.

1.2.7 Electric Generator

A Caterpillar Model C32 ATAAC, or equivalent, diesel-fired, 1,000-kW electric generator will be included. The maximum diesel fuel firing rate is 100 gallons per hour. The unit will provide back-up electricity to the facility in the event that the two primary power supplies are interrupted. The emergency generator is expected to operate no more than 200 hours per year including testing for approximately 1 hour per week; however the modeling analysis in Attachment 3 is based on 500 hours per year to be conservative.

1.2.8 Air Handling Units

There will be 10 natural gas-fired rooftop air handling units to condition make-up air to the building ventilation systems. The heat input ratings of these units are listed in Attachment 2, Emission Calculations.

1.3 CONSTRUCTION SCHEDULE

The anticipated schedule for the project is as follows:

June 2007	Start construction of Phase I (Administration Building, Central Utility Plant, Small Scale Manufacturing Building, and Product Development/Quality Control Building
November 2007	Start construction of Phase II (Timothy Pollen Processing Building)
November 2008	Start construction of Phase III (Birch Pollen, Ragweed Pollen, and Spanish Mites Processing Buildings)

Attachment 2

ATTACHMENT 2

EMISSION CALCULATIONS

ATTACHMENT 2
EMISSION CALCULATIONS

Emissions of regulated (criteria and toxic) air pollutants from each source or source group are calculated below. Potential emissions represent the maximum theoretical emissions that would occur if the source was operated at its full capacity on a continuous basis (8,760 hours per year). Actual emissions represent the expected baseline emissions, which reflect the actual operating level and schedule of each source. These emissions are different from the modeled emissions (see Attachment 3) that were used in establishing the respective facility emission caps.

BOILERS – Source Nos. HB1, HB2, HB3, HB4, and SB2

The facility will include four 125-hp, fire-tube, natural gas-fired boilers and one 50-hp fire-tube, natural gas-fired boiler, all equipped with low-NO_x burners. Two of the 125-hp boilers will be installed during the initial construction phase, with the other two 125-hp boilers and the 50-hp boiler being added in the future.

Emissions are calculated using emission factors in the EPA publication, AP-42, A Compilation of Air Pollutant Emission Factors, 5th Edition, Volume I, Section 1.4, Natural Gas Combustion:

NO_x	50 lb/10^6 cf natural gas
CO	84 lb/10^6 cf natural gas
SO_x	0.6 lb/10^6 cf natural gas
PM	7.6 lb/10^6 cf natural gas
VOC	5.5 lb/10^6 cf natural gas

Hourly and annual emissions are summarized in the spreadsheet on the following page.

Actual Emissions

Actual emissions reflect the fact that the boilers will not operate around the clock at maximum capacity. In reality, no more than two of the boilers will operate at any time; the third boiler will serve as a standby unit. For purposes of calculating actual emissions, Biopol assumes the following boiler operations:

- Maximum hourly emissions – three of the 125-hp boilers operating at maximum capacity
- Annual emissions – three of the 125-hp boilers operating at the equivalent of maximum capacity for 2,000 hr/yr

Maximum Actual Hourly Emissions:

NO_x	50 lb/10^6 cf x 5,952 cf/hr x 3 boilers = 0.89 lb/hr
CO	84 lb/10^6 cf x 5,952 cf/hr x 3 boilers = 1.50 lb/hr
SO_x	0.6 lb/10^6 cf x 5,952 cf/hr x 3 boilers = 0.01 lb/hr
PM	7.6 lb/10^6 cf x 5,952 cf/hr x 3 boilers = 0.14 lb/hr
VOC	5.5 lb/10^6 cf x 5,952 cf/hr x 3 boilers = 0.10 lb/hr

Actual Annual Emissions:

NO_x	0.89 lb/hr x 2,000 hr/yr x 1 ton/2,000 lb = 0.89 ton/yr
CO	1.50 lb/hr x 2,000 hr/yr x 1 ton/2,000 lb = 1.50 ton/yr
SO_x	0.01 lb/hr x 2,000 hr/yr x 1 ton/2,000 lb = 0.01 ton/yr
PM	0.14 lb/hr x 2,000 hr/yr x 1 ton/2,000 lb = 0.14 ton/yr
VOC	0.10 lb/hr x 2,000 hr/yr x 1 ton/2,000 lb = 0.10 ton/yr

ELECTRIC GENERATOR – Source No. CU-3

The electric generator is rated at 1,000 kW (1 MW), which is equivalent to 1,382 brake horsepower (bhp). It will fire diesel fuel at a rate of 100 gal/hr. SO_x emissions are calculated using the NSPS regulatory limit of 500 ppm. NO_x, non-methane hydrocarbons (NMHC), CO, and PM emissions are based on the allowable limits established in the New Source Performance Standard for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII):

NO_x + NMHC	6.4 gm/kW-hr[a]
CO	3.5 gm/kW-hr
PM	0.2 gm/kW-hr

[a] It is assumed that NO_x represents 88 percent of the total (5.61 gm/kW-hr) and NMHC represents 12 percent of the total (0.79 gm/kW-hr). These fractions are derived from the EPA Tier 1 standards for each pollutant.

Potential Emissions

The engine will serve strictly as an emergency power source. The modeling analysis presented in Attachment 3 is based on a maximum of 500 hours of operation per year, which includes weekly readiness testing for approximately one hour and emergency operation. The potential emissions are presented in the following spreadsheet, which also lists the boiler emissions.

Insert Emission Spreadsheet

(L:\Projects\IPS\Biopol\308\0701 Combustion Equipment Emission Inventory 30032007R1.xls)

Client: Biopol Laboratory, Inc.
Project Name: New Post Falls Facility
Project No.: EHS07308.01
Filename: T:\Safety and Compliance\Safety and Compliance II\Safety and Compliance I\New Facilities\PF Air Permit\Permit App Data, 4-17-2007\4-18-07 Revised Files\[Combustion Equipment Emisson Inventory 03302007R2.XLS]Sheet1

Preliminary Mechanical Equipment List							EMISSION FACTORS														
Equip. Tag	Bldg	Location	Service	Description	CAPACITY	CAPACITY UNITS	NOx	Units	Reference	CO	Units	Reference	PM10	Units	Reference	VOC	Units	Reference	SOx	Units	Reference
AHU-1	USM	Roof	USM Inoculation Area	1,500 CFM (3 HP), 5.8 Tons, 66 MBH, 100% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system	66,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
AHU-2	USM	Roof	USM Process /Support	4,250 CFM (7-1/2 HP SF / 3 HP RF), 11.5 Tons, 55 MBH, 50% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system	55,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
AHU-3	SSM	Roof	SSM Pollen Lab	24,500 CFM (40 HP SF / 15 HP RF), 101.2 Tons, 723 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system	723,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
AHU-4	USM	Roof	Prod Dev / QC Labs	20,000 CFM (40 HP SF / 15 HP RF), 67.5 Tons, 628 MBH, 80% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system	628,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
AHU-6	ADM	Roof	Administration	15,000 CFM (25 HP supply, 7-1/2 HP return), 38 Tons, 84 MBH, 40% OA, DX packaged rooftop AHU, packaged controls for system	84,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
AHU-7		Roof	Timothy Pollen	21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 619 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system. (Future)	619,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
AHU-8		Roof	Ragweed	21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 619 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system. (Future)	619,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
AHU-9		Roof	Birch	21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 619 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system. (Future)	619,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
AHU-10		Roof	Spanish Miles	24,250 CFM (40 HP SF), 93.1 Tons, 1060 MBH, 100% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system. (Future)	1,060,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
AHU-11		Roof	SSM Expansion	24,500 CFM (40 HP SF / 15 HP RF), 101.2 Tons, 723 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system. (Future)	723,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
HB-1	CUP	1st Flr	Heating Hot Water system	Natural gas-fired, fire-tube hot water boiler, 125 BHP	6,250,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
HB-2	CUP	1st Flr	Heating Hot Water system	Natural gas-fired, fire-tube hot water boiler, 125 BHP	6,250,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
HB-3	CUP	1st Flr	Heating Hot Water system	Natural gas-fired, fire-tube hot water boiler, 125 BHP. (Future)	6,250,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
HB-4	CUP	1st Flr	Heating Hot Water system	Natural gas-fired, fire-tube hot water boiler, 125 BHP. (Future)	6,250,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
SB-1	CUP	1st Flr	Humidification	Electric, steam boiler, 45 BHP. (Existing)																	
SB-2	CUP	1st Flr	Humidification	Natural gas-fired, fire-tube steam boiler, 50 BHP. (Future)	2,500,000	Btu/hr	50	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	84.0	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	7.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	5.5	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98	0.6	lb/MMCF	USEPA, AP-42 Section 1.4, 07/98
CU-3				1000 kW Generator	1,000	kW	5.61	g/kW-hr	40 CFR §60.4205(b)	3.5	g/kW-hr	40 CFR §60.4205(b)	0.2	g/kW-hr	40 CFR §60.4205(b)	0.79	g/kW-hr	40 CFR §60.4205(b)	500	ppm	40 CFR §60.4207

[1] Natural Gas External Combustion is in SCF and IC Engine is gallons

Client: Biopol Laboratory, Inc.
Project Name: New Post Falls Facility
Project No.: EHS07308.01
Filename: T:\Safety and Compliance\Safety and Compliance II\Safety and Compliance II\New Facilities\PF Air Permit\Pe

Preliminary Mechanical Equipment List

Equip. Tag	Bldg	Location	Service	Description	Fuel Heating Value	Fuel Heating Value Units	Fuel Usage Per hour[1]	Operating Hrs per year	Fuel Usage Per Year[1]	EMISSIONS NOx lbs/hr	NOx tpy	CO lbs/hr	CO tpy	PM10 lbs/hr	PM10 tpy	VOC lbs/hr	VOC tpy	SOx lbs/hr	SOx tpy
AHU-1	USM	Roof	USM Inoculation Area	1,500 CFM (3 HP), 5.8 Tons, 66 MBH, 100% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system	1050	Btu/SCF	63	8,760	551,880	0.0032	0.014	0.005	0.023	0.0005	0.002	0.0003	0.002	0.0000	0.000
AHU-2	USM	Roof	USM Process /Support	4,250 CFM (7-1/2 HP SF / 3 HP RF), 11.5 Tons, 55 MBH, 50% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system	1050	Btu/SCF	52	8,760	455,520	0.0026	0.011	0.004	0.019	0.0004	0.002	0.0003	0.001	0.0000	0.000
AHU-3	SSM	Roof	SSM Pollen Lab	24,500 CFM (40 HP SF / 15 HP RF), 101.2 Tons, 723 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system	1050	Btu/SCF	689	8,760	6,035,640	0.0345	0.151	0.058	0.253	0.0052	0.023	0.0038	0.017	0.0004	0.002
AHU-4	USM	Roof	Prod Dev / QC Labs	20,000 CFM (40 HP SF / 15 HP RF), 67.5 Tons, 628 MBH, 80% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system	1050	Btu/SCF	598	8,760	5,238,480	0.0299	0.131	0.050	0.220	0.0045	0.020	0.0033	0.014	0.0004	0.002
AHU-6	ADM	Roof	Administration	15,000 CFM (25 HP supply, 7-1/2 HP return), 38 Tons, 84 MBH, 40% OA, DX packaged rooftop AHU, packaged controls for system	1050	Btu/SCF	80	8,760	700,800	0.0040	0.018	0.007	0.029	0.0006	0.003	0.0004	0.002	0.0000	0.000
										0.0742	**0.3250**	**0.1240**	**0.5440**	**0.0112**	**0.0500**	**0.0081**	**0.0360**	**0.0008**	**0.0040**
AHU-7		Roof	Timothy Pollen	21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 619 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system. **(Future)**	1050	Btu/SCF	590	8,760	5,168,400	0.0295	0.129	0.050	0.217	0.0045	0.020	0.0032	0.014	0.0004	0.002
AHU-8		Roof	Ragweed	21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 619 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system. **(Future)**	1050	Btu/SCF	590	8,760	5,168,400	0.0295	0.129	0.050	0.217	0.0045	0.020	0.0032	0.014	0.0004	0.002
AHU-9		Roof	Birch	21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 619 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system. **(Future)**	1050	Btu/SCF	590	8,760	5,168,400	0.0295	0.129	0.050	0.217	0.0045	0.020	0.0032	0.014	0.0004	0.002
										0.0885	**0.3870**	**0.1500**	**0.6510**	**0.0135**	**0.0600**	**0.0096**	**0.0420**	**0.0012**	**0.0060**
AHU-10		Roof	Spanish Mites	24,250 CFM (40 HP SF), 93.1 Tons, 1060 MBH, 100% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system. **(Future)**	1050	Btu/SCF	1,010	8,760	8,847,600	0.0505	0.221	0.085	0.372	0.0077	0.034	0.0056	0.024	0.0006	0.003
AHU-11		Roof	SSM Expansion	24,500 CFM (40 HP SF / 15 HP RF), 101.2 Tons, 723 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system. **(Future)**	1050	Btu/SCF	689	8,760	6,035,640	0.0345	0.151	0.058	0.253	0.0052	0.023	0.0038	0.017	0.0004	0.002
										0.0850	**0.3720**	**0.1430**	**0.6250**	**0.0129**	**0.0570**	**0.0094**	**0.0410**	**0.0010**	**0.0050**
HB-1	CUP	1st Flr	Heating Hot Water system	Natural gas-fired, fire-tube hot water boiler, 125 BHP	1050	Btu/SCF	5,952	8,760	52,139,520	0.30	1.3	0.5	2.2	0.05	0.20	0.03	0.14	0.00	0.02
HB-2	CUP	1st Flr	Heating Hot Water system	Natural gas-fired, fire-tube hot water boiler, 125 BHP	1050	Btu/SCF	5,952	8,760	52,139,520	0.30	1.3	0.5	2.2	0.05	0.20	0.03	0.14	0.00	0.02
HB-3	CUP	1st Flr	Heating Hot Water system	Natural gas-fired, fire-tube hot water boiler, 125 BHP. **(Future)**	1050	Btu/SCF	5,952	8,760	52,139,520	0.30	1.3	0.5	2.2	0.05	0.20	0.03	0.14	0.00	0.02
HB-4	CUP	1st Flr	Heating Hot Water system	Natural gas-fired, fire-tube hot water boiler, 125 BHP. **(Future)**	1050	Btu/SCF	5,952	8,760	52,139,520	0.30	1.3	0.5	2.2	0.05	0.20	0.03	0.14	0.00	0.02
SB-1	CUP	1st Flr	Humidification	Electric, steam boiler, 45 BHP. **(Existing)**															
SB-2	CUP	1st Flr	Humidification	Natural gas-fired, fire-tube steam boiler, 50 BHP. **(Future)**	1050	Btu/SCF	2,381	8,760	20,857,560	0.12	0.5	0.2	0.9	0.02	0.08	0.01	0.06	0.00	0.01
CU-3				1000 kW Generator	140000	Btu/gallon	67.05	500	33,525	12.36	3.09	7.71	1.93	0.44	0.11	1.74	0.44	0.49	0.12
									Total	14.18	10.96	10.74	15.27	0.74	1.32	1.92	1.30	0.50	0.24

[1] Natural Gas External Combustion is in SCF and IC Engine is gallons

Actual Emissions

It is expected that the generator will operate no more than 200 hours per year, which is the basis of the following calculations.

Hourly Actual Emissions

NO_x:	0.88 x 6.4 gm/kW-hr x 1,000 kW x 1 lb/453.59 gm = 12.36 lb/hr
CO:	3.5 gm/kW-hr x 1,000 kW x 1 lb/453.59 gm = 7.71 lb/hr
SO_x:	67.1 gal/hr x 7.3 lb/gal x 0.0005 lb S/lb oil x 2 lb SO_2/lb S = 0.49 lb/hr
PM:	0.20 gm/kW-hr x 1,000 kW x 1 lb/453.59 gm = 0.44 lb/hr
NMHC:	0.12 x 6.4 gm/kW-hr x 1,000 kW x 1 lb/453.59 gm = 1.74 lb/hr

Annual Actual Emissions

Annual actual emissions are based on the generator operating 200 hr/yr:

NO_x:	12.36 lb/hr x 200 hr/yr x 1 ton/2,000 lb = 1.24 ton/yr
CO:	7.71 lb/hr x 200 hr/yr x 1 ton/2,000 lb = 0.77 ton/yr
SO_x:	0.49 lb/hr x 200 hr/yr x 1 ton/2,000 lb = 0.05 ton/yr
PM:	0.44 lb/hr x 200 hr/yr x 1 ton/2,000 lb = 0.04 ton/yr
VOC:	1.74 lb/hr x 200 hr/yr x 1 ton/2,000 lb = 0.17 ton/yr

AIR HANDLING UNITS – Source Nos. AHU-1, 2, 3, 4, 6, 7, 8, 9, 10, and 11

The 10 air handling units (AHUs) are listed on the emission spreadsheet above. It should be noted that AHU-5, which will serve the warehouse will provide only cooling and humidification; therefore, it does not burn natural gas and is not an emission source. Potential emissions are presented in the above spreadsheet, based on AP-42 emission factors.

Actual Emissions

Actual emissions are calculated using the same emission factors and the assumption that each unit will operate for the equivalent of maximum capacity for 2,000 hr/yr. The following tables summarize the actual maximum hourly emissions and actual annual emissions from the 11 AHUs.

NO_x Emissions from Air Handling Units

Air Handling Unit	Actual Emissions	
	Maximum Hourly Emissions, lb/hr	Annual Emissions, ton/yr
AHU-1	0.0032	0.0032
AHU-2	0.0026	0.0026
AHU-3	0.0345	0.0345
AHU-4	0.0299	0.0299
AHU-6	0.0040	0.0040
AHU-7	0.0295	0.0295
AHU-8	0.0295	0.0295
AHU-9	0.0295	0.0295
AHU-10	0.0505	0.0505
AHU-11	0.0345	0.0345

CO Emissions from Air Handling Units

Air Handling Unit	Actual Emissions	
	Maximum Hourly Emissions, lb/hr	Annual Emissions, ton/yr
AHU-1	0.005	0.005
AHU-2	0.004	0.004
AHU-3	0.058	0.058
AHU-4	0.050	0.050
AHU-6	0.007	0.007
AHU-7	0.050	0.050
AHU-8	0.0500	0.0500
AHU-9	0.05	0.05
AHU-10	0.085	0.085
AHU-11	0.058	0.058

PM_{10} Emissions from Air Handling Units

Air Handling Unit	Actual Emissions	
	Maximum Hourly Emissions, lb/hr	Annual Emissions, ton/yr
AHU-1	0.0005	0.0005
AHU-2	0.0004	0.0004
AHU-3	0.0052	0.0052
AHU-4	0.0045	0.0045
AHU-6	0.0006	0.0006
AHU-7	0.0045	0.0045
AHU-8	0.0045	0.0045
AHU-9	0.0045	0.0045
AHU-10	0.0077	0.0077
AHU-11	0.0052	0.0052

VOC Emissions from Air Handling Units

Air Handling Unit	Actual Emissions	
	Maximum Hourly Emissions, lb/hr	Annual Emissions, ton/yr
AHU-1	0.0003	0.0003
AHU-2	0.0003	0.0003
AHU-3	0.0038	0.0038
AHU-4	0.0033	0.0033
AHU-6	0.0004	0.0004
AHU-7	0.0032	0.0032
AHU-8	0.0032	0.0032
AHU-9	0.0032	0.0032
AHU-10	0.0056	0.0056
AHU-11	0.0038	0.0038

SO_x Emissions from Air Handling Units

Air Handling Unit	Actual Emissions	
	Maximum Hourly Emissions, lb/hr	Annual Emissions, ton/yr
AHU-1	<0.0001	<0.0001
AHU-2	<0.0001	<0.0001
AHU-3	0.002	0.002
AHU-4	0.002	0.002
AHU-6	<0.0001	<0.0001
AHU-7	0.002	0.002
AHU-8	0.002	0.002
AHU-9	0.002	0.002
AHU-10	0.003	0.003
AHU-11	0.002	0.002

PROCESS EMISSIONS:

Process emissions (particulate, VOC, and TAP) will occur from the following operations at the facility: (i) Timothy, Birch, and Ragweed Pollen Processing, which will take place in dedicated buildings; (ii) Small Scale Manufacturing (SSM) and U.S. Mites Processing, which will take place in the Administration Building; (iii) the Process Development/Quality Control Laboratory, which will also be located in the Administration Building; (iv) Spanish Mites Processing; and (v) SSM Expansion, both of which will take place in a dedicated building.

POLLEN PROCESSING – Source Nos. B-34, B-30, B-36, R-33, R-27, R-39, T-20, T-21, and T-37

Potential Particulate Emissions

Potential emissions from all pollen processing and other processes are calculated using the conservative assumption that the outlet concentration will be 0.01 grains per dry standard cubic foot (gr/dscf). The results are summarized in Table 2-1 below.

Table 2-1. Potential Particulate Emissions

Source ID	Source	Exhaust Air Flow, cfm	Potential Emissions	
			lb/hr	ton/yr
T-21	Timothy Fluid Bed Dryer	5,000	0.43	1.88
B-37	Timothy Pneumatic Conveyor	500	0.04	0.19
B-30	Birch Fluid Bed Dryer	5,000	0.43	1.88
B-36	Birch Pneumatic Conveyor	500	0.04	0.19
R-27	Ragweed Fluid Bed Dryer	5,000	0.43	1.88
R-39	Ragweed Pneumatic Conveyor	500	0.04	0.19
SM-38	Spanish Mites Media Prep	1,250	0.11	0.47
SM-40	Spanish Mites Pneumatic Conveyor	3,000	0.26	1.13
A-5	House Vacuum System – Administration	500	0.04	0.19
T-22	House Vacuum System – Timothy	500	0.04	0.19
B-31	House Vacuum System – Birch	500	0.04	0.19
R-28	House Vacuum System – Ragweed	500	0.04	0.19
SM-25	House Vacuum System – Spanish Mites	500	0.04	0.19
P-1	U.S. Mites/SSM Building Exhaust	14,970	1.28	5.62
P-2	Process Development Hoods	5,000	0.43	1.88

Actual Particulate Emissions

In the Timothy Pollen process, particulate matter will be emitted from the Fluid Bed Dryer/Separator, which discharges through an integral cyclone for product recovery, and then through a secondary cyclone and HEPA filter for emission control. A batch yield of 50 kg of wet product is introduced into the dryer in a one-hour period. It is estimated that 0.25 percent of this batch weight passes through the primary and secondary cyclones, to the HEPA filter.

Inlet to HEPA filter = 50 kg/hr x 2.2046 lb/kg x 0.0025 = 0.28 lb/hr

The HEPA filter has an efficiency of 99 percent. Therefore, the expected atmospheric emissions are:

0.28 lb/hr x (1.00 – 0.99) = 0.003 lb/hr
0.003 lb/hr x 7,000 gr/lb x 1 hr/60 min ÷ 1,000 scf = 0.0004 gr/dscf

At an operating schedule of 2,600 hr/yr, annual emissions will be:

0.003 lb/hr x 2,600 hr/yr ÷ 2,000 lb/ton = 0.004 ton/yr

TAP Emissions

Solvents will be emitted from the removal of the lipid layer surrounding the pollen, referred to as de-fatting the pollen, which is accomplished by washing the pollen in acetone in the Filter/Dryer, which is served by a vent condenser to recover the majority of the acetone. Biopol projects that 4,740 lb/yr of acetone will be emitted from the Timothy Pollen Processing Building.

4,740 lb/yr ÷ 2,000 lb/ton = **2.37 ton/yr**

Based on an operating schedule of 2,600 hr/yr, hourly emissions will be:

4,740 lb/yr ÷ 2,600 hr/yr = **1.82 lb/hr**

It should be noted that acetone is not a VOC or a HAP, but is a non-carcinogenic TAP.

Emissions from processing Birch and Ragweed pollen are each projected to be three times the emissions from processing Timothy pollen:

Particulate

3 x 0.003 lb/hr = 0.009 lb/hr
3 x 0.004 ton/yr = 0.012 ton/yr

Acetone

3 x 1.82 lb/hr = 5.46 lb/hr
3 x 2.37 ton/yr = 7.11 ton/yr

Actual Particulate Emissions -- Remaining Sources

For the following particulate emission sources, actual hourly emissions are presumed to be one half of the potential emissions shown in Table 2-1 above. Actual annual emissions are calculated from the actual hourly emissions on the basis of 2,600 operating hours per year. These emissions are summarized in Table 2-2 below

Table 2-2. Actual Particulate Emissions

Source ID	Source	Exhaust Air Flow, cfm	Actual Emissions	
			lb/hr	ton/yr
B-37	Timothy Pneumatic Conveyor	500	0.02	0.03
B-36	Birch Pneumatic Conveyor	500	0.02	0.03
R-39	Ragweed Pneumatic Conveyor	500	0.02	0.03
SM-38	Spanish Mites Media Prep	1,250	0.06	0.08
SM-40	Spanish Mites Pneumatic Conveyor	3,000	0.13	0.17
A-5	House Vacuum System – Administration	500	0.02	0.03
T-22	House Vacuum System – Timothy	500	0.02	0.03
B-31	House Vacuum System – Birch	500	0.02	0.03
R-28	House Vacuum System – Ragweed	500	0.02	0.03
SM-25	House Vacuum System – Spanish Mites	500	0.02	0.03
P-1	U.S. Mites/SSM Building Exhaust	14,970	0.64	0.83
P-2	Process Development Hoods	5,000	0.22	0.29

PROCESS DEVELOPMENT/QUALITY CONTROL LABORATORY – Source No. P-2

Acetone, IPA, ethanol, and methanol emissions from this area will be measured and included with all other plant emissions since the emissions of these solvents are calculated as the difference between purchased and recovered quantities. Actual emissions are estimated to be equivalent to those measured from the Spokane facility in 2006.

Compound	VOC	HAP	TAP
Acetone			Non-Carcinogen
Isopropyl Alcohol	X		Non-Carcinogen
Ethanol	X		Non-Carcinogen
Methanol	X	X	Non-Carcinogen

Emissions of these compounds are calculated below.

Acetone

1,600 lb/yr
1,600 lb/yr ÷ 2,600 hr/yr = **0.61 lb/hr**
1,600 lb/yr ÷ 2,000 lb/ton = **0.80 ton/yr**

Isopropyl Alcohol

78 lb/yr
78 lb/yr ÷ 2,600 hr/yr = **0.03 lb/hr**
78 lb/yr ÷ 2,000 lb/ton = **0.04 ton/yr**

Ethanol

127 lb/yr
127 lb/yr ÷ 2,600 hr/yr = **0.05 lb/hr**
127 lb/yr ÷ 2,000 lb/ton = **0.06 ton/yr**

Methanol

Methanol emissions are based on 5 percent of ethanol emissions:

0.05 x 127 lb/yr = 6.4 lbs/year
6.4 lbs/year ÷ 2,600 hr/yr = **0.002 lb/hr**
6.4 lb/year ÷ 2,000 lb/ton = **0.003 ton/yr**

U.S. MITES/SMALL SCALE MANUFACTURING – Source No. P-1

The Small Scale Manufacturing (including the U.S. Mites) operation is being relocated from Biopol's facility in Spokane, WA for which reliable solvent usage and emission data are available. Biopol is projecting that the Small Scale Manufacturing production at the Post Falls facility will be three times the 2006 production level at the Spokane facility. The processing is on a lab scale or pilot-scale basis and will not create significant emissions; therefore, no control equipment will be needed.

Compound	VOC	HAP	TAP
Acetone			Non-Carcinogen
Isopropyl Alcohol	X		Non-Carcinogen
Ethanol	X		Non-Carcinogen
Methanol	X	X	Non-Carcinogen
Tetrachloroethylene	X	X	Carcinogen

Emissions of these compounds are calculated below.

Acetone

3 x 1,600 lb/year = 4,800 lb/yr

4,800 lb/yr ÷ 2,600 hr/yr = **1.85 lb/hr**
4,800 lb/yr ÷ 2,000 lb/ton = **2.4 ton/yr**

Isopropyl Alcohol

3 x 78 lb/yr = 234 lb/yr
234 lb/year ÷ 2,600 hr/yr = **0.09 lb/hr**
234 lb/year ÷ 2,000 lb/ton = **0.12 ton/yr**

Ethanol

3 x 127 lb/yr = 381 lb/yr
381 lb/yr ÷ 2,600 hr/yr = **0.15 lb/hr**
381 lb/yr ÷ 2,000 lb/ton = **0.19 ton/yr**

Methanol

Methanol emissions are projected to be 5 percent of the ethanol emissions:

0.05 x 381 = 19.1 lb/year
19.1 lb/year ÷ 2,600 hr/yr = **0.007 lb/hr**
19.1 lb/year ÷ 2,000 lb/ton = **0.01 ton/yr**

Tetrachloroethylene

Tetrachloroethylene (perchloroethylene) will be used intermittently for processing certain pollens which cannot be cleaned mechanically. Biopol projects that 500 lb/yr of tetrachloroethylene will be used, of which ⅔ will be recovered and ⅓ emitted.

0.33 x 500 = 165 lbs/year

Since tetrachloroethylene will not be used routinely throughout the year, worst-case hourly emissions are calculated assuming that the entire year's production will occur during a two-week period:

165 lbs/year ÷ (16 hr/day x 6 day/wk x 2 weeks) = **0.86 lb/hr**
165 lb/year ÷ 2,000 lb/ton = **0.08 ton/yr**

<u>SPANISH MITES PROCESSING – Source No. SM-23</u>

Initial (baseline) ethanol emissions from Spanish Mites processing are projected to be 563 lb/yr (0.28 ton/yr). Using a production schedule of 2,600 hr/yr, baseline hourly ethanol emissions are:

563 lb/yr ÷ 2,600 hr/yr = **0.22 lb/hr**

Ethanol emissions from processing Spanish Mites are projected to eventually increase to 12,287 lb/yr (6.14 ton/yr). Using a production schedule of 2,600 hr/yr, maximum hourly ethanol emissions will be:

12,287 lb/yr ÷ 2,600 hr/yr = **4.73 lb/hr**

TAPs Summary

The following table summarizes the emissions of TAPs and compares them to the screening levels (ELs) in IDAPA 58.01.01.585 and 586.

TAP	Calculated Emissions		EL, lb/hr
	lb/hr	ton/yr	
Acetone	15.2	19.79	119
Isopropyl alcohol	0.12	0.16	65.3
Ethanol	4.93	6.39	125
Methanol	0.009	0.013	17.3
Tetrachloroethylene[a]	0.86	0.08	0.013

[a] Because the hourly emissions for tetrachloroethylene exceed the EL, modeling is required. See Attachment 3 for refined modeling report.

HOUSE VACUUM SYSTEMS - Source Nos. A-5, B-31, R-28, SM-25, and T-22

Potential Emissions

Potential emissions from the five vacuum systems are based on an outlet concentration of 0.01 gr/dscf and summarized in the particulate emission table.

Actual Emissions

Each of the five vacuum systems will be used for keeping the labs and processing areas as free of airborne and settled particulate matter as possible. It is conservatively estimated that each unit collects 20 lb/day. At a removal efficiency of 99.9 percent, emissions will be:

20 lb/day x (1.00- 0.999) ÷ 8 hr/day = **0.003 lb/hr (each system)**

0.003 lb/hr x 2,600 hr/yr ÷ 2,000 lb/ton = **0.04 ton/yr (each system)**