

27362



Twin Pines Minerals, LLC

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DEC 23 2019

Air Protection
Branch

December 20, 2019

Mr. Eric Cornwell
Manager, Stationary Source Permitting Program
Georgia Air Protection Branch
4244 International Pkwy #120
Atlanta, GA 30354

**Re: SIP Permit Application for Mineral Processing Plant
Twin Pines Minerals, LLC – St. George (Charlton County)**

Dear Mr. Cornwell:

Twin Pines Minerals, LLC (Twin Pines) hereby submits two copies of a SIP permit application to construct and operate a mineral processing plant in St. George, Georgia. As discussed in our pre-application meeting, we are requesting an expedited permit review and have enclosed the appropriate application form in Appendix A. Please note that we are considering constructing the dry processing portion of the plant on the property of a nearby chip mill located less than a mile to the east of the location identified on the drawings included in Appendix D. We will forward updated site drawings as they become available.

If you need more information or have any questions, please contact Mr. Frank Burbach of Environmental Planning Specialists at 678-336-8531 or myself at 205-403-5287.

Sincerely,

Mark Fowler

Environmental Manager - Twin Pines Minerals, LLC

enclosures: 2 copies of SIP Permit Application

Prepared for:

TWIN PINES MINERALS, LLC
2100 Southbridge Parkway, Suite 540
Birmingham, AL 35209

CONSTRUCTION PERMIT APPLICATION
TWIN PINES MINERALS, LLC
St. George, Georgia

Prepared by:



a Montrose Environmental Group company

400 Northridge Road, Suite 400
Sandy Springs, Georgia 30350
Tel: 404-315-9113

December 2019

CONSTRUCTION PERMIT APPLICATION

TWIN PINES MINERALS, LLC
St. George, GA 31562

Prepared for
TWIN PINES MINERALS, LLC
2100 Southbridge Parkway, Suite 540
Birmingham, AL 35209

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400 Northridge Road, Suite 400
Sandy Springs, GA 30350
Tel: 404-315-9113

Frank Burbach, PE
Associate

Farhana Momin
Project Engineer

December 2019

**CONSTRUCTION PERMIT APPLICATION
TWIN PINES MINERALS, LLC
2100 Southbridge Parkway, Suite 540
Birmingham, AL 35209**

December 2019

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Process Description	1
1.1.1	Dragline Mining	1
1.1.2	Pre-Concentrator Plants (PCPs)	1
1.1.3	Wet Concentrator Plant (WCP)	2
1.1.4	Mineral Separation Plant (MSP) and Product Loadout.....	2
1.2	Point Source Emission Units.....	2
1.3	Production Rates	3
1.4	Application Contacts	3
1.5	Submittal Organization.....	3
2	EMISSIONS ESTIMATES.....	5
3	REGULATORY ANALYSIS	6
3.1	Prevention of Significant Deterioration of Air Quality	6
3.2	New Source Performance Standards	6
3.3	State Requirements	8
4	TESTING AND MONITORING	10

APPENDICES

- Appendix A SIP Forms
- Appendix B Emissions Calculations
- Appendix C List of Emission Units
- Appendix D Figures
- Appendix E Manufacturer's Documentation

1 INTRODUCTION

Twin Pines Minerals, LLC (Twin Pines) is hereby applying for a permit to construct and operate a mineral sands processing plant to produce mineral concentrates of titanium, staurolite, and zircon. Twin Pines will be located at 7773 Hwy 94, St. George, (Charlton County) Georgia, 31562, and will be considered a minor source with respect to Prevention of Significant Deterioration (PSD) and Title V air permitting.

1.1 Process Description

The process flow diagram for the proposed Twin Pines facility in St. George, GA is provided in Appendix D. Processes at the plant will include: dragline mining, pre-concentration plants (PCP1 and PCP2), wet concentrator plant (WCP), and mineral separation plant (MSP), also known as the “dry plant”. A brief description of each plant and associated operations is provided below.

1.1.1 Dragline Mining

Twin Pines will install a dragline surface mining system at the St. George, GA facility in Charlton County. Sands rich in minerals will be excavated from the mine using a dragline excavator and transported via conveyor belt to one of two pre-concentrator plants (PCPs). After processing the sands to separate the minerals (titanium, staurolite, and zircon), the remaining silica material will be returned by conveyor belt to backfill the mine behind the dragline excavator, and trees will be planted on top of the returned sand. Note that these conveyor belts and associated transfer points between the mine and the plants are not subject to the Federal Rule, 40 CFR 60 Subpart LL (Subpart LL) requirements since they are not physically located at one of the concentrator plants (PCP, WCP, MSP).

1.1.2 Pre-Concentrator Plants (PCPs)

Twin Pines is proposing to build two pre-concentrator plants (PCP1 and PCP2). These PCPs will receive sand from the dragline mining operations via conveyor belt. At the PCP, the sand is mixed with water (piped in from a nearby retention pond) to make a slurry. The slurry will pass through a spiral system at the PCP to separate the silica from the mineral products. The silica will be de-watered and returned to backfill the mine using a separate conveyor system, and the pre-concentrated mineral slurry will be transferred by pipe to the wet concentrator plant (WCP) for additional processing. Note that the processing that occurs at the PCP is considered “wet” and no emissions are expected.

1.1.3 Wet Concentrator Plant (WCP)

HMC slurry will be transferred from the PCP to the WCP by pipe, where it is further concentrated into a heavy mineral concentrate (HMC). The mineral products will be separated from the water through a hydrocyclone and are allowed to briefly “air dry” in stockpiles outside of the WCP for a few days to allow some of the moisture to evaporate. Once the moisture content of the stockpiled minerals has reduced to around 40%, the mineral products are transported by truck to the dry plant or MSP. Like the PCP, processes that occur at the WCP are still “wet” and no emissions are expected.

1.1.4 Mineral Separation Plant (MSP) and Product Loadout

After air drying, the “wet” mineral products are transported by truck from the WCP to the MSP, where they are dried out completely using a combination of three dryers and two electric re-heaters located at the dry plant (DY01, DY02, DY04, RH01, RH02). The indirect-fired dryers range in capacity from 1.02 to 5.32 MMBtu/hr and burn propane. Combustion emissions from the dryers are vented outside (uncontrolled) via stack. Process emissions from the dryers and electric re-heaters (dust and particulates) are controlled by wet dynamic dust scrubbers (SB01 and SB02). Emissions from other processes and equipment at the MSP, including bucket elevators, storage bins, screens, and product packing stations are controlled by one of two baghouses or cartridge filters (DC01 and DC03). For a complete list of equipment and associated control devices, please refer to the Emission Unit list in Appendix C.

There is an optional process at the MSP, which will re-slurry the zircon if certain product grades need to be achieved (based on customer requirements). If needed, zircon can be re-slurried and passed through an additional spiral separation system to increase the concentration of zircon in the final product.

Each of the bulk mineral products (titanium, staurolite and zircon) will be incorporated into one shift bin for checking product grade and one product bin for holding product ready for loadout. Each product system works the same way. If the desired product specification is achieved, the contents of the shift bin will be transferred to the product bins for truck load out. If the product fails to meet desired grade, it will be transferred directly to a truck for later reprocessing.

1.2 Point Source Emission Units

The primary emissions sources at the facility are three (3) indirect-fired propane rotary dryers with EU ID Nos. DY01, DY02, and DY04, and two (2) electrically-heated feed reheaters (EU ID Nos. RH01 and RH02). The process emissions from the dryers and reheaters will be controlled by two wet dynamic dust scrubbers (SB01 and SB02). Additionally, the plant will include mineral processing and conveying equipment consisting of high tension separators, magnetic separators, bucket elevators, and bagging facility bag handlers and trash screens. These sources

will be controlled by two cartridge filters (DC01 and DC03). A list of emission units is provided in Appendix C. Detailed descriptions of the control equipment are provided in Appendix E.

1.3 Production Rates

The following process and production rates are expected for the emission units:

- 1) The maximum process and production rate of the HMC Dryer No. 1 (DY01, EU004) is 157,680 dry tons per year of heavy mineral sands which is derived from the design feed rate of the dryer (18 dry tons per hour).
- 2) The maximum process and production rate of the Zircon Dryer (DY02, EU005) is 25,054 dry tons per year of heavy mineral sands which is derived from the design feed rate of the dryer (3 dry tons per hour).
- 3) The maximum process and production rate of the HMC Dryer No. 2 (DY04, EU006) is 157,680 dry tons per year of heavy mineral sands which is derived from the design feed rate of the dryer (18 dry tons per hour).
- 4) The maximum process and production rate of the Electric Reheater No. 1 (RH01, EU007) is 72,270 dry tons per year of heavy mineral sands which is derived from the design feed rate of the reheater (8 dry tons per hour).
- 5) The maximum process and production rate of the Electric Reheater No. 2 (RH02, EU008) is 72,270 dry tons per year of heavy mineral sands which is derived from the design feed rate of the reheater (8 dry tons per hour).
- 6) The maximum process and production rates of the Mineral Process and Conveying Equipment (EU009 and EU010), as well as the Transfer and Processing Fugitive Emission Points (EU011), are assumed equivalent to the maximum hourly processing rate of 32 tons/hr, which equates to 280,320 dry tons per year of heavy mineral sand.

1.4 Application Contacts

The contact persons for additional information about this permit application submittal are Mr. Mark Fowler (205-403-5287, mfowler@twinpinesminerals.com) and Mr. Frank Burbach of EPS (404-315-9113, fburbach@montrose-env.com).

1.5 Submittal Organization

This submittal is organized into four (4) sections with additional appendices. The main sections and appendices are as follows:

Section 1.0 (Introduction) provides background information on the facility, including a detailed process description, and identifies the contact personnel. A summary of the permit application organization is provided.

Section 2.0 (Emissions Estimates) contains summary information on emissions from the facility.

Section 3.0 (Regulatory Analysis) presents the results and conclusions of a detailed regulatory review for the facility.

Section 4.0 (Testing and Monitoring) presents the proposed testing and monitoring for the facility.

Appendix A (SIP Forms) contains the required Georgia EPD SIP application forms.

Appendix B (Emissions Calculations) contains the emission calculations supporting the permit application.

Appendix C (Emission Units) contains a complete list of the emissions units for the facility, including associated plant locations and applicable control devices (or fugitives).

Appendix D (Figures) contains the supporting figures/drawings for the permit application, including a general area map and process flow diagram.

Appendix E (Manufacturer's Documentation) contains manufacturer's supporting documentation for relevant equipment (including control devices).

2 EMISSIONS ESTIMATES

For the purposes of this application, the pollutants of concern were restricted to regulated pollutants under the 1990 Clean Air Act Amendments. These pollutants include nitrogen oxides (NO_x), sulfur dioxide (SO₂), particulate matter (PM), particulate matter less than or equal to 10 micrometers in diameter (PM₁₀), particulate matter less than or equal to 2.5 micrometers in diameter (PM_{2.5}), carbon monoxide (CO), volatile organic compounds (VOC), and hazardous air pollutants (HAPs). The facility-wide potential emissions are presented in Table 2.1. Calculations supporting the emission estimates presented in this permit application are provided in Appendix B.

As shown in Table 2.1 below, the potential emissions of each pollutant are below the relevant PSD and Title V Major Source Thresholds. Therefore, PSD and Title V permitting are not triggered by this construction, and Twin Pines may apply for True Minor Source Status. Please see Section 3 of this narrative for additional information on the regulatory determination.

Table 2.1 – Facility Potential Emissions Summary

Pollutant	Potential Emissions (tons/yr)	PSD Major Source Thresholds (tons/yr)	Title V Major Source Thresholds (tons/yr)
NO _x	7.26	250	100
VOC	0.45	250	100
CO	4.19	250	100
SO ₂	0.06	250	100
PM/PM ₁₀ /PM _{2.5}	7.64	250	100
Total HAP	0.09	N/A	25

3 REGULATORY ANALYSIS

A review of the applicable federal and state air quality regulations is provided below.

3.1 Prevention of Significant Deterioration of Air Quality

New major stationary sources of air pollution and major modifications to major stationary sources are potentially required to obtain permits under the PSD program. The proposed facility will be located in Charlton County, which is classified as being in attainment for all National Ambient Air Quality Standards (NAAQS). Therefore, PSD permitting requirements apply in Charlton County for these pollutants. PSD requirements define a “major source” as any source that has the potential to emit criteria air pollutants at levels equal to or greater than 250 tons/yr or 100 tons/yr (if the source falls under one of 28 source categories). The proposed Twin Pines facility is not categorized as one of the 28 listed source categories; therefore, the 250 tons/yr threshold applies.

The Twin Pines facility will have potential emissions of PSD regulated pollutants below 250 tons/yr; therefore, it will be considered a minor source with respect to PSD. As shown in Table 2.1 in the previous section, the facility’s potential emissions for PSD regulated pollutants are less than the 250 tons/yr thresholds. Consequently, PSD major source permitting does not apply to this project.

3.2 New Source Performance Standards

Standards of Performance for Metallic Mineral Processing Plants [40 CFR Part 60 Subpart LL]

Twin Pines will be subject to 40 CFR Part 60 Subpart LL because it is a metallic mineral processing plant which produces metallic mineral concentrates from mineral sands. The facility will demonstrate compliance by complying with applicable requirements under 60.382, 60.384, and 60.385 which includes the following:

- Standards for Particulate Matter
 - (a) On and after the date on which the performance test is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from an affected facility any stack emissions that:
 - (1) Contain particulate matter in excess of 0.05 grams per dry standard cubic meter (0.05 g/dscm).

(2) Exhibit greater than 7 percent opacity, unless the stack emissions are discharged from an affected facility using a wet scrubbing emission control device.

- (b) On and after the sixtieth day after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup, fugitive emissions greater than 10% opacity shall not be emitted from processes.

[40 CFR 60.382]

- Test Methods:

To demonstrate compliance with the emission limits, EPA Method 5 will be used to determine particulate matter concentration and EPA Method 9 will be used to determine opacity from stack emissions.

[40 CFR 60.386]

- Initial Testing:

- During the initial performance test of each of the wet scrubbers, the facility will record the measurements of both the change in pressure of the gas stream across the scrubber and the scrubbing liquid flow rate.

[40 CFR 60.385 (b)]

- Monitoring Requirements for Owners and Operators that the facility will follow:

- Install, calibrate, maintain, and operate a monitoring device for the continuous measurement of the change in pressure of the gas stream through the wet scrubber. The monitoring device must be certified by the manufacturer to be accurate within ± 250 pascals (± 1 inch water) gauge pressure and must be calibrated on an annual basis in accordance with manufacturer's instructions.

[40 CFR 60.384(a)]

- Install, calibrate, maintain, and operate a monitoring device for the continuous measurement of the scrubbing liquid flow rate to a wet scrubber. The monitoring device must be certified by the manufacturer to be accurate within ± 5 percent of design scrubbing liquid flow rate and must be calibrated on at least an annual basis in accordance with manufacturer's instructions.

[40 CFR 60.384(b)]

- Notification, Reporting and Recordkeeping Requirements:

- An initial notification is required after the performance test is complete.

[40 CFR 60.385(a)]

- After the initial performance test of the wet scrubbers, the owner or operator shall submit semiannual reports to the Administrator of occurrences when the measurements of the scrubber pressure loss (or gain) or liquid flow rate differ by more than ± 30 percent from the average obtained during the most recent performance

test. The reports required under paragraph (c) shall be postmarked within 30 days following the end of the second and fourth calendar quarters.

[40 CFR 60.385(c),(d)]

Standards of Performance for Calciners and Dryers in Mineral Industries [40 CFR Part 60 Subpart UUU]

This rule does not apply because the facility is subject to 40 CFR 60 Subpart LL. The rule specifically exempts facilities subject to 40 CFR 60 Subpart LL from applicability (40 CFR 60.730(b)).

Standards of Performance for Nonmetallic Processing Plants [40 CFR Part 60 Subpart OOO]

This rule does not apply to metallic mineral processing operations (40 CFR 60.670(a)(2)).

3.3 State Requirements

Requirements for control of air pollution in Georgia are contained in Georgia's Rules for Air Quality Control, Chapter 391-3-1. Subparts of the Code that are potentially applicable to the proposed project are discussed below.

Title V Operating Permits [391-3-1-.03(10) and 40 CFR Part 70]

The potential emissions from the proposed facility have been compared to the major source thresholds found in 40 CFR Part 70 for Title V Operating Permits and Georgia Rule 391-3-1-.03(1). The facility will not be a Title V major source.

Visible Emissions [391-3-1-.02(2)(b)]

The following limit will apply to equipment at the facility:

- Opacity may not be equal to or exceed 40 percent.

Note that although this rule applies, it is subsumed by more stringent requirements under 40 CFR 60 Subpart LL.

Fuel-Burning Equipment [391-3-1-.02(2)(d)]

The following limits will apply to the fuel burning equipment at the facility:

- Particulate emissions must not exceed 0.5 pounds per million BTU heat input;
- Visible emissions the opacity of which is equal to or greater than 20% except for one six minute period per hour of not more than twenty-seven 27% opacity.

Particulate Emissions from Manufacturing Processes [391-3-1-.02(2)(e)]

The following limits will apply to equipment at the facility:

- Particulate emissions must not exceed $4.1 \times P^{0.67}$ for process input weight rate up to and including 30 tons per hour;
- Particulate emissions must not exceed $55 \times P^{0.11} - 40$ for process input weight above 30 tons per hour.

Where P = process input weight rate in tons per hour.

Note that although this rule applies, it is subsumed by more stringent requirements under 40 CFR 60 Subpart LL.

Sulfur Dioxide [391-3-1-.02(2)(g)]

The following limit will apply to the facility:

- Fuel sulfur content of no more than 2.5% by weight (for fuel burning sources with maximum heat input capacity below 100 MMBtu/hr).

The facility will comply with this regulation by burning propane, which has a sulfur content well below the limit.

Fugitive Dust [391-3-1-.02(2)(n)]

Twin Pines will be required to take all reasonable precautions to prevent fugitive dust from becoming airborne and to maintain visible emissions from fugitive dust below 20% opacity.

Note that although this rule applies, it is subsumed by more stringent requirements under 40 CFR 60 Subpart LL.

Prevention of Significant Deterioration of Air Quality [391-3-1-.02(7)]

Construction of the Twin Pines facility will not trigger PSD major source permitting as discussed in the sections above.

4 TESTING AND MONITORING

To demonstrate compliance with 40 CFR Part 60 Subpart LL, the following testing and monitoring is proposed.

1. Conduct initial performance tests (Method 5) of the wet scrubbers, during which the change in pressure of the gas stream across the scrubbers and the scrubbing liquid flow rates will be measured. Initial Testing:

During the initial performance test of a wet scrubber, and at least weekly thereafter, the owner or operator shall record the measurements of both the change in pressure of the gas stream across the scrubber and the scrubbing liquid flow rate.

[40 CFR 60.385(b)].

2. Monitor and record the change in pressure of the gas stream through the wet scrubbers and the scrubbing liquid flow rate to a wet scrubbers. [40 CFR 60.384(b)]
3. Conduct initial performance tests (Methods 5 and 9) of the dry dust collectors (DC01 and DC03).
4. Submit an initial notification after the initial performance test is complete. Submit semiannual reports postmarked within 30 days following the end of the second and fourth calendar quarters, which would include occurrences when the measurements of the scrubber pressure loss (or gain) or liquid flow rate differ by more than ± 30 percent from the average obtained during the most recent performance test.

APPENDIX A

SIP Forms



EXPEDITED PERMITTING PROGRAM – APPLICATION FOR ENTRY TO PROGRAM FOR AIR PERMITS

RECEIVED

EPD Use Only

Date Received: DEC 23 2019

Application No. 27362

To be eligible for expedited review, this application form must be accompanied by the complete permit application for the type of air permit being requested, and a pre-application meeting with EPD must have been conducted.

1. Contact Information

Facility Name: Twin Pines Minerals, LLC - Charlton County

AIRS No. (if known): 04-13- -

Contact Person: Mark Fowler Title: Environmental Manager

Telephone No.: 205-403-5287 Alternate Phone No.: _____

Email Address: mfowler@twinpinesminerals.com

If EPD is unable to contact me, please contact the alternate contact person:

Contact Person: Steven Ingle Title: President

Telephone No.: 205-545-8759 Alternate Phone No.: _____

Email Address: single@twinpinesminerals.com

On Page 2 of this form, please check the appropriate box for which type of air permit you are requesting expedited review.

I have read the Expedited Review Program Standard Operating Procedures and accept all of the terms and conditions within. I understand that it is my responsibility to ensure an application of the highest quality is submitted and to address any requests for additional information by the deadline specified. I understand that submittal of this request form is not a guarantee that expedited review will be granted.

Signature: _____

Date: 12-20-19

2. Applying For Which Type Of Permit: (Please Check Appropriate Box)

Expedited Review Fees for Air Permits	
<u>Permit Type – Please Check One</u>	<u>Expedited Review Fee*</u>
<input type="checkbox"/> Generic Permit: Concrete Batch Plant – Minor Source	\$1,000
<input type="checkbox"/> Generic Permit: Concrete Batch Plant – Synthetic Minor Source	\$1,500
<input type="checkbox"/> Generic Permit: Hot Mix Asphalt Plant – Synthetic Minor Source	\$2,000
<input checked="" type="checkbox"/> Minor Source Permit (or Amendment)	\$3,000
<input type="checkbox"/> Synthetic Minor Permit (or Amendment)	\$4,000
<input type="checkbox"/> Major Source SIP Permit not subject to PSD or 112(g)	\$6,000
<input type="checkbox"/> Title V 502(b)(10) Permit Amendment	\$4,000
<input type="checkbox"/> Title V Minor Modification with Construction	\$4,000
<input type="checkbox"/> Title V Significant Modification	\$6,000
<input type="checkbox"/> Major Source SIP Permit subject to 112(g) but not subject to PSD	\$15,000
<input type="checkbox"/> PSD Permit (or Amendment) not subject to NAAQS and/or PSD Increment Modeling	\$15,000
<input type="checkbox"/> PSD Permit (or Amendment) subject to NAAQS and/or PSD Increment Modeling but not subject to Modeling for PM _{2.5} , NO ₂ , or SO ₂	\$20,000
<input type="checkbox"/> PSD Permit (or Amendment) subject to NAAQS and/or PSD Increment Modeling for PM _{2.5} , NO ₂ , or SO ₂	\$25,000
<input type="checkbox"/> PSD Permit (or Amendment) subject to NAAQS and/or PSD Increment Modeling for PM _{2.5} , NO ₂ , or SO ₂ and also impacting a Class I Area	\$30,000
<p>* Do not send fee payment with this form. Upon acceptance of application for the expedited permit program, EPD will notify you by phone. Fees must be paid via check to "Georgia Department of Natural Resources" within five (5) business days of acceptance.</p>	

3. Comments.

This section is optional. Applicants may use this field to include specific comments or requests for EPD consideration. For example, the applicant may use this field to request a public hearing or to remind EPD of review time needs and/or expectations that may differ from the time frames in the procedures.

6. Reason for Application: (Check all that apply)☒ New Facility (to be constructed)☐ Revision of Data Submitted in an Earlier Application☐ Existing Facility (initial or modification application)

Application No.: _____

☒ Permit to ConstructDate of Original
Submittal: _____☒ Permit to Operate☐ Change of Location☐ Permit to Modify Existing Equipment: Affected Permit No.: _____**7. Permitting Exemption Activities (for permitted facilities only):**

Have any exempt modifications based on emission level per Georgia Rule 391-3-1-.03(6)(i)(3) been performed at the facility that have not been previously incorporated in a permit?

☒ No ☐ Yes, please fill out the SIP Exemption Attachment (See Instructions for the attachment download)**8. Has assistance been provided to you for any part of this application?**☐ No☐ Yes, SBAP☒ Yes, a consultant has been employed or will be employed.

If yes, please provide the following information:

Name of Consulting Company: Environmental Planning Specialists, Inc.Name of Contact: Frank BurbachTelephone No.: 404-315-9113Fax No.: 404-315-8509Email Address: fburbach@montrose-env.comMailing Address: Street: 400 Northridge Road, Suite 400City: Sandy SpringsState: GAZip: 30350

Describe the Consultant's Involvement:

Permit application preparation.

9. Submitted Application Forms: Select only the necessary forms for the facility application that will be submitted.

No. of Forms	Form
1	2.00 Emission Unit List
	2.01 Boilers and Fuel Burning Equipment
	2.02 Storage Tank Physical Data
	2.03 Printing Operations
	2.04 Surface Coating Operations
	2.05 Waste Incinerators (solid/liquid waste destruction)
1	2.06 Manufacturing and Operational Data
1	3.00 Air Pollution Control Devices (APCD)
1	3.01 Scrubbers
1	3.02 Baghouses & Other Filter Collectors
	3.03 Electrostatic Precipitators
1	4.00 Emissions Data
1	5.00 Monitoring Information
1	6.00 Fugitive Emission Sources
	7.00 Air Modeling Information

10. Construction or Modification DateEstimated Start Date: 1st Quarter 2020

11. If confidential information is being submitted in this application, were the guidelines followed in the "Procedures for Requesting that Submitted Information be treated as Confidential"?

☐ No ☐ Yes

12. New Facility Emissions Summary

Criteria Pollutant	New Facility	
	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)	4.19	4.19
Nitrogen oxides (NOx)	7.26	7.26
Particulate Matter (PM) (filterable only)	7.64	7.64
PM <10 microns (PM10)	7.64	7.64
PM <2.5 microns (PM2.5)	7.64	7.64
Sulfur dioxide (SO ₂)	0.06	0.06
Volatile Organic Compounds (VOC)	0.45	0.45
Greenhouse Gases (GHGs) (in CO ₂ e)		
Total Hazardous Air Pollutants (HAPs)	0.09	0.09
Hexane (Individual HAP)	0.09	0.09

13. Existing Facility Emissions Summary

Criteria Pollutant	Current Facility		After Modification	
	Potential (tpy)	Actual (tpy)	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)				
Nitrogen oxides (NOx)				
Particulate Matter (PM) (filterable only)				
PM <10 microns (PM10)				
PM <2.5 microns (PM2.5)				
Sulfur dioxide (SO ₂)				
Volatile Organic Compounds (VOC)				
Greenhouse Gases (GHGs) (in CO ₂ e)				
Total Hazardous Air Pollutants (HAPs)				
Individual HAPs Listed Below:				

14. 4-Digit Facility Identification Code:

SIC Code:	1099	SIC Description:	Miscellaneous Metal Ores
NAICS Code:	212299	NAICS Description:	All Other Metal Ore Mining

15. Description of general production process and operation for which a permit is being requested. If necessary, attach additional sheets to give an adequate description. Include layout drawings, as necessary, to describe each process. References should be made to source codes used in the application.

Twin Pines Minerals, LLC hereby submits this air permit application requesting to construct and operate a new mineral sands processing facility located at 6874 Hwy 94, St. George, GA 31562 (Charlton County). The facility will process sands to produce titanium products, zircon products, and staurolite products. Processes at the plant will include: dragline mining, pre-concentration plants (PCP) 1 and 2, wet concentrator plant (WCP), and dry plant or mineral separation plant (MSP). Primary emissions sources for the facility include combustion emissions (criteria pollutants and HAP) from indirect-fired propane rotary dryers. PM emissions from the dryers will be controlled by wet scrubbers. Additional PM emissions from mineral processing and conveying equipment will be controlled by cartridge filters. Fugitive dust emissions from hauling roads will be controlled by wet suppression, as needed.

16. Additional information provided in attachments as listed below:

Attachment A -	Appendix A – SIP Application Forms
Attachment B -	Appendix B – Emissions Calculations
Attachment C -	Appendix C – Emission Units
Attachment D -	Appendix D – Figures
Attachment E -	Appendix E – Manufacturer's Documentation
Attachment F -	

17. Additional Information: Unless previously submitted, include the following two items:

- ☒ Plot plan/map of facility location or date of previous submittal: See Appendix D – Figures
- ☒ Flow Diagram or date of previous submittal: See Appendix D – Figures

18. Other Environmental Permitting Needs:

Will this facility/modification trigger the need for environmental permits/approvals (other than air) such as Hazardous Waste Generation, Solid Waste Handling, Water withdrawal, water discharge, SWPPP, mining, landfill, etc.?

☐ No ☒ Yes, please list below:

Surface Mining, Industrial Stormwater, Industrial Waste Water, Groundwater Withdrawal, Section 404

19. List requested permit limits including synthetic minor (SM) limits.

None – the facility is applying for True Minor Source Status.

Facility Name: Twin Pines Minerals, LLC – Charlton County Date of Application: December 2019

FORM 2.00 – EMISSION UNIT LIST

Emission Unit ID	Name	Manufacturer and Model Number	Description
	Please see Appendix C for a complete list of Emission Units and descriptions.		

Facility Name: Twin Pines Minerals, LLC – Charlton County Date of Application: December 2019

FORM 2.06 – MANUFACTURING AND OPERATIONAL DATA

Normal Operating Schedule: 24 hours/day 7 days/week 52 weeks/yr

Additional Data Attached? ☒ - No ☐ - Yes, please include the attachment in list on Form 1.00, Item 16.

Seasonal and/or Peak Operating Periods: N/A

Dates of Annually Occurring Shutdowns: N/A

PRODUCTION INPUT FACTORS

Emission Unit ID	Emission Unit Name	Const. Date	Input Raw Material(s)	Annual Input	Hourly Process Input Rate		
					Design	Normal	Maximum
EU001	Pre-Concentrator Plant No. 1	TBD	Sand Slurry	8.76 MM ton/yr	1,000 ton/yr	1,000 ton/yr	1,000 ton/yr
EU002	Pre-Concentrator Plant No. 2	TBD	Sand Slurry	8.76 MM ton/yr	1,000 ton/yr	1,000 ton/yr	1,000 ton/yr
EU003	Wet Concentrator Plant	TBD	Sand Slurry	1.93 MM tpy	220 ton/hr	220 ton/hr	220 ton/hr
EU004	HMC Dryer No. 1 DY01	TBD	Mineral Product	157,680 tpy	18 ton/hr	18 ton/hr	18 ton/hr
EU005	Zircon Dryer DY02	TBD	Mineral Product	25,054 tpy	3 ton/hr	3 ton/hr	3 ton/hr
EU006	HMC Dryer No. 2 DY04	TBD	Mineral Product	157,680 tpy	18 ton/hr	18 ton/hr	18 ton/hr
EU007	Electric Reheater No. 1 RH01	TBD	Mineral Product	72,270 tpy	8 ton/hr	8 ton/hr	8 ton/hr
EU008	Electric Reheater No. 2 RH02	TBD	Mineral Product	72,270 tpy	8 ton/hr	8 ton/hr	8 ton/hr
EU009	Mineral Processing and Conveying Equipment (Controlled by DC01)	TBD	Mineral Product	280,320 tpy	32 ton/hr	32 ton/hr	32 ton/hr
EU010	Mineral Processing and Conveying Equipment (Controlled by DC02)	TBD	Mineral Product	280,320 tpy	32 ton/hr	32 ton/hr	32 ton/hr
EU011	Transfer and Processing Fugitive Emission Points	TBD	Mineral Product	280,320 tpy	32 ton/hr	32 ton/hr	32 ton/hr

PRODUCTS OF MANUFACTURING

Emission Unit ID	Description of Product	Production Schedule		Hourly Production Rate (Give units: e.g. lb/hr, ton/hr)			
		Tons/yr	Hr/yr	Design	Normal	Maximum	Units
MSP	Titanium Products	96,500	8760	11	11	11	ton/hr
MSP	Zircon Products	50,000	8,760	5.7	5.7	5.7	ton/hr
MSP	Staurolite Products	35,000	8,760	4	4	4	ton/hr

Date of Application: November 2019[illegible]

Facility Name:	Date of Application:
Twin Pines Minerals, LLC – Charlton County	December 2019

FORM 3.01 – SCRUBBERS

[illegible]

December 2019

Emission Rates

[illegible]

Facility Name: Twin Pines Minerals, LLC – Charlton County Date of Application: December 2019

FORM 5.00 MONITORING INFORMATION

Emission Unit ID/ APCD ID	Emission Unit/APCD Name	Monitored Parameter		Monitoring Frequency
		Parameter	Units	
SB01	Scrubber SB01	Pressure Drop	inches W.C.	Weekly
SB01	Scrubber SB01	Flow Rate	gallons/min	Weekly
SB02	Scrubber SB02	Pressure Drop	inches W.C.	Weekly
SB02	Scrubber SB02	Flow Rate	gallons/min	Weekly

Comments:

Facility Name: Twin Pines Minerals, LLC – Charlton County **Date of Application:** December 2019

FORM 6.00 – FUGITIVE EMISSION SOURCES

[illegible]

APPENDIX B

Emissions Calculations

**Twin Pines Minerals, LLC
Charlton County, GA
Potential Emissions**

Potential Emissions Summary for the Mineral Separation Plant (MSP)

Criteria Pollutants	HMC Dryers No. 1 & 2 (DY01 & DY04) (tons/yr) EACH	Zircon Dryer (DY02) (tons/yr)	Baghouses (DC01 & DC03) (tons/yr)	Total PTE (tons/yr)
NOx	3.31	0.64	NA	7.26
CO	1.91	0.37	NA	4.19
PM/PM10/PM2.5	1.14	1.00	4.36	7.64
SO ₂	0.03	0.00	NA	0.06
VOC	0.20	0.04	NA	0.45
Total HAP	0.04	0.01	NA	0.09
Individual HAP (Hexane)	0.04	0.01	NA	0.09

Twin Pines Minerals, LLC
Charlton County, GA
Potential Emissions from DY01 and DY04

Unit Names	HMC Dryer No. 1 (DY01) & HMC Dryer No. 2 (DY04)	
Total Heat Input Capacity	5.32	MMBtu/hr (each)
HHV of Propane	91.5	MMBtu/Mgal
HHV of Natural Gas	1,020	Btu/scf
Maximum Operating Hours	8,760	hr/yr
Wet Scrubber Exhaust Capacity	1,173	scfm

Emissions through Process Stack (SB1S and SB2S, each unit):

Criteria Pollutants	Emission Factor (gr/dscf)	Potential Emissions (lb/hr)	Potential Emissions (tpy)	Emission Factor Source
PM/PM10/PM2.5	0.022	0.22	0.96	40 CFR 60 Subpart LL

Emissions through Combustion Stack (D1CS & D4CS, each unit):

Criteria Pollutants	Emission Factor (lb/Mgal)	Emission Factor (lb/MMscf)	Potential Emissions (lb/hr)	Potential Emissions (tpy)	Emission Factor Source
NOx	13.0	0.142	0.76	3.31	AP-42, Section 1.5
CO	7.5	0.082	0.44	1.91	AP-42, Section 1.5
PM/PM10/PM2.5	0.7	0.008	0.04	0.18	AP-42, Section 1.5
SO ₂	0.1	0.001	0.006	0.03	AP-42, Section 1.5
VOC	0.8	0.009	0.05	0.20	AP-42, Section 1.5

HAPs	Emission Factor (lb/MMscf)	Potential Emissions (lb/hr)	Potential Emissions (tpy)
Benzene	2.10E-03	1.10E-05	4.80E-05
Toluene	3.40E-03	1.77E-05	7.77E-05
Formaldehyde	7.50E-02	3.91E-04	1.71E-03
Naphthalene	6.10E-04	3.18E-06	1.39E-05
Acenaphthylene	1.80E-06	9.40E-09	4.12E-08
Acenaphthene	1.80E-06	9.40E-09	4.12E-08
Fluorene	2.80E-06	1.46E-08	6.40E-08
Phenanthrene	1.70E-05	8.87E-08	3.89E-07
Anthracene	2.40E-06	1.25E-08	5.49E-08
Fluoranthene	3.00E-06	1.57E-08	6.86E-08
Pyrene	5.00E-06	2.61E-08	1.14E-07
Benzo(a)anthracene	1.80E-06	9.40E-09	4.12E-08
Chrysene	1.80E-06	9.40E-09	4.12E-08
Benzo(b)fluoranthene	1.80E-06	9.40E-09	4.12E-08
Benzo(k)fluoranthene	1.80E-06	9.40E-09	4.12E-08
Benzo(a)pyrene	1.20E-06	6.26E-09	2.74E-08
Indeno(1,2,3,c,d)pyrene	1.80E-06	9.40E-09	4.12E-08
Dibenzo(a,h)anthracene	1.20E-06	6.26E-09	2.74E-08
Benzo(g,h,i)perylene	1.20E-06	6.26E-09	2.74E-08
2-Methylnaphthalene	2.40E-05	1.25E-07	5.49E-07
3-Methylchloranthrene	1.80E-06	9.40E-09	4.12E-08
7,12- Dimethylbenz(a)anthracene	1.60E-05	8.35E-08	3.66E-07
Dichlorobenzene	1.20E-03	6.26E-06	2.74E-05
Hexane	1.80E+00	9.40E-03	4.12E-02
Lead	5.00E-04	2.61E-06	1.14E-05
Arsenic	2.00E-04	1.04E-06	4.57E-06
Beryllium	1.20E-05	6.26E-08	2.74E-07
Cadmium	1.10E-03	5.74E-06	2.51E-05
Chromium	1.40E-03	7.31E-06	3.20E-05
Cobalt	8.40E-05	4.38E-07	1.92E-06
Manganese	3.80E-04	1.98E-06	8.69E-06
Mercury	2.60E-04	1.36E-06	5.94E-06
Nickel	2.10E-03	1.10E-05	4.80E-05
Selenium	2.40E-05	1.25E-07	5.49E-07
Total HAP:		0.010	0.04

Notes:

- Criteria pollutant emission factors for propane combustion are based on AP-42, Section 1.5 (July 2008), except for PM emission factors.
- PM10 and PM2.5 from the process stack are assumed to be equal to the PM emission rate and is calculated from the PM emission standard in 40 CFR 60 Subpart LL.
- PM emission factor : 0.022 gr/dscf
- Wet Scrubber Exhaust Flow Rate (cfm) = 3000 Nm³/hr x 0.589 cfm/m³/hr
- Pre-Control PM Emissions (lb/hr) = 0.022 (gr/dscf) x 1767 (dscf/min) x 60 (min/hr) / 7,000 (gr/lb)
- HAP emission factors for propane combustion are not available; therefore, propane combustion HAP emissions are assumed to be equal to those while firing natural gas (AP-42, Section 1.4).

Twin Pines Minerals, LLC
Charlton County, GA
Potential Emissions from DY02

Unit Name	Zircon Dryer (DY02)	
Total Heat Input Capacity	1.02	MMBtu/hr
HHV of Propane	91.5	MMBtu/Mgal
HHV of Natural Gas	1,020	Btu/scf
Maximum Operating Hours	8,760	hr/yr
Wet Scrubber Exhaust Capacity	1,173	scfm

Emissions through Scrubber Stack (SB1S):

Criteria Pollutants	Emission Factor (gr/dscf)	Potential Emissions (lb/hr)	Potential Emissions (tpy)	Emission Factor Source
PM/PM10/PM2.5	0.022	0.22	0.96	40 CFR 60 Subpart LL

Emissions through Combustion Stack (D2CS):

Criteria Pollutants	Emission Factor (lb/Mgal)	Emission Factor (lb/MMscf)	Potential Emissions (lb/hr)	Potential Emissions (tpy)	Emission Factor Source
NOx	13.0	0.142	0.15	0.64	AP-42, Section 1.5
CO	7.5	0.082	0.08	0.37	AP-42, Section 1.5
PM/PM10/PM2.5	0.7	0.008	0.01	0.03	AP-42, Section 1.5
SO ₂	0.1	0.001	0.001	0.005	AP-42, Section 1.5
VOC	0.8	0.009	0.01	0.04	AP-42, Section 1.5

HAPs	Emission Factor (lb/MMscf)	Potential Emissions (lb/hr)	Potential Emissions (tpy)
Benzene	2.10E-03	2.11E-06	9.23E-06
Toluene	3.40E-03	3.41E-06	1.49E-05
Formaldehyde	7.50E-02	7.53E-05	3.30E-04
Naphthalene	6.10E-04	6.12E-07	2.68E-06
Acenaphthylene	1.80E-06	1.81E-09	7.91E-09
Acenaphthene	1.80E-06	1.81E-09	7.91E-09
Fluorene	2.80E-06	2.81E-09	1.23E-08
Phenanthrene	1.70E-05	1.71E-08	7.47E-08
Anthracene	2.40E-06	2.41E-09	1.06E-08
Fluoranthene	3.00E-06	3.01E-09	1.32E-08
Pyrene	5.00E-06	5.02E-09	2.20E-08
Benzo(a)anthracene	1.80E-06	1.81E-09	7.91E-09
Chrysene	1.80E-06	1.81E-09	7.91E-09
Benzo(b)fluoranthene	1.80E-06	1.81E-09	7.91E-09
Benzo(k)fluoranthene	1.80E-06	1.81E-09	7.91E-09
Benzo(a)pyrene	1.20E-06	1.20E-09	5.28E-09
Indeno(1,2,3,c,d)pyrene	1.80E-06	1.81E-09	7.91E-09
Dibenzo(a,h)anthracene	1.20E-06	1.20E-09	5.28E-09
Benzo(g,h,i)perylene	1.20E-06	1.20E-09	5.28E-09
2-Methylnaphthalene	2.40E-05	2.41E-08	1.06E-07
3-Methylchloranthrene	1.80E-06	1.81E-09	7.91E-09
7,12- Dimethylbenz(a)anthracene	1.60E-05	1.61E-08	7.03E-08
Dichlorobenzene	1.20E-03	1.20E-06	5.28E-06
Hexane	1.80E+00	1.81E-03	7.91E-03
Lead	5.00E-04	5.02E-07	2.20E-06
Arsenic	2.00E-04	2.01E-07	8.79E-07
Beryllium	1.20E-05	1.20E-08	5.28E-08
Cadmium	1.10E-03	1.10E-06	4.84E-06
Chromium	1.40E-03	1.41E-06	6.16E-06
Cobalt	8.40E-05	8.43E-08	3.69E-07
Manganese	3.80E-04	3.81E-07	1.67E-06
Mercury	2.60E-04	2.61E-07	1.14E-06
Nickel	2.10E-03	2.11E-06	9.23E-06
Selenium	2.40E-05	2.41E-08	1.06E-07
Total HAP:		0.002	0.01

Notes:

- Criteria pollutant emission factors for propane combustion are based on AP-42, Section 1.5 (July 2008), except for PM emission factors.
- PM10 and PM2.5 from the process stack are assumed to be equal to the PM emission rate and is calculated from the PM emission standard in 40 CFR 60 Subpart LL.
- PM emission factor : 0.022 gr/dscf
- Wet Scrubber Exhaust Flow Rate (cfm) = 3000 Nm³/hr x 0.589 cfm/m³/hr
- Pre-Control PM Emissions (lb/hr) = 0.022 (gr/dscf) x 1767 (dscf/min) x 60 (min/hr) / 7,000 (gr/lb)
- HAP emission factors for propane combustion are not available; therefore, propane combustion HAP emissions are assumed to be equal to those while firing natural gas (AP-42, Section 1.4).

Twin Pines Minerals, LLC
Charlton County, GA
Potential Emissions from DC01 and DC02

Unit Names Baghouses (DC01 & DC03)

Type of Dust Collector	Baghouse Maximum Outlet Grain Loading (gr/dscf)	Baghouse Exhaust Flow Rate (scfm)	Post-Control Potential Emissions		Emissions Factor Source
			(lb/hr)	(tpy)	
Baghouse 1	0.022	2660	0.50	2.18	40 CFR 60 Subpart LL
Baghouse 3	0.022	2660	0.50	2.18	40 CFR 60 Subpart LL
Total				4.36	

Baghouse outlet grain loading (gr/dscf) = $0.05 \text{ (g/dscm)} \times 7000 \text{ (gr/lb)} \times 1000 \text{ (mg/g)} / [35.31 \text{ (ft}^3\text{/m}^3) \times 453592 \text{ (mg/lb)}]$
Post-Control PM Emissions (lb/hr) = $0.022 \text{ (gr/dscf)} \times 2660 \text{ (dscf/min)} \times 60 \text{ (min/hr)} / 7,000 \text{ (gr/lb)}$

APPENDIX C

List of Emission Units

Twin Pines Minerals, LLC
Charlton County, GA - Emission Units PCPs

Emission Source Code	Emission Source Description
Wet processes listed in 40 CFR Part 60 Subpart LL (no emissions)	
Storage Bins	
SU004	Surge Bin
Screens	
	Trash Screen
	Oversize protection screen

Twin Pines Minerals, LLC
Charlton County, GA - Emission Units WCP

Emission Source Code	Emission Source Description
Wet processes listed in 40 CFR Part 60 Subpart LL (no emissions)	
WCV01	Trommel Oversize Conveyor
W2BN01	Surge Bin - Top
W1BN01	Surge Bin - Bottom
WSB01	Rotary Trommel Screen
WSC01	Trommel Underflow Screen
WSC03	Rougher RC Concentrate Screen
WHP09	Trommel Underflow Hopper
WHP10	Trommel Underflow Slimes Hopper
WHP01	Tailings Transfer Hopper
WHP02	Primary Cyclone Feed Hopper
WHP04	Rougher RC U/F Hopper
WHP06	Cleaner RC Feed Hopper
WHP05	Concentrate Hopper
WHP07	Tails Hopper
WHP18	HMC Hopper
WHP11	WCP HMC Spirals Feed Hopper
WHP12	WCP HMC Secondary Spirals Feed Hopper
WHP13	WCP HMC Scavenger Spirals Feed Hopper
WHP14	WCP Scavenger Circuit Rougher Spirals Feed Hopper
WHP15	WCP Scavenger Circuit Spirals Feed Hopper
WHP16	WCP Scavenger Circuit Cleaner Spirals Feed Hopper
WHP19	Primary HMC Hopper
WHP20	Scavenger Circuit HMC Hopper
WHP17	WCP Spirals Tailings Hopper
WHP22	HMC Cyclone O/F Hopper

Twin Pines Minerals, LLC
Charlton County, GA - Emission Units MSP

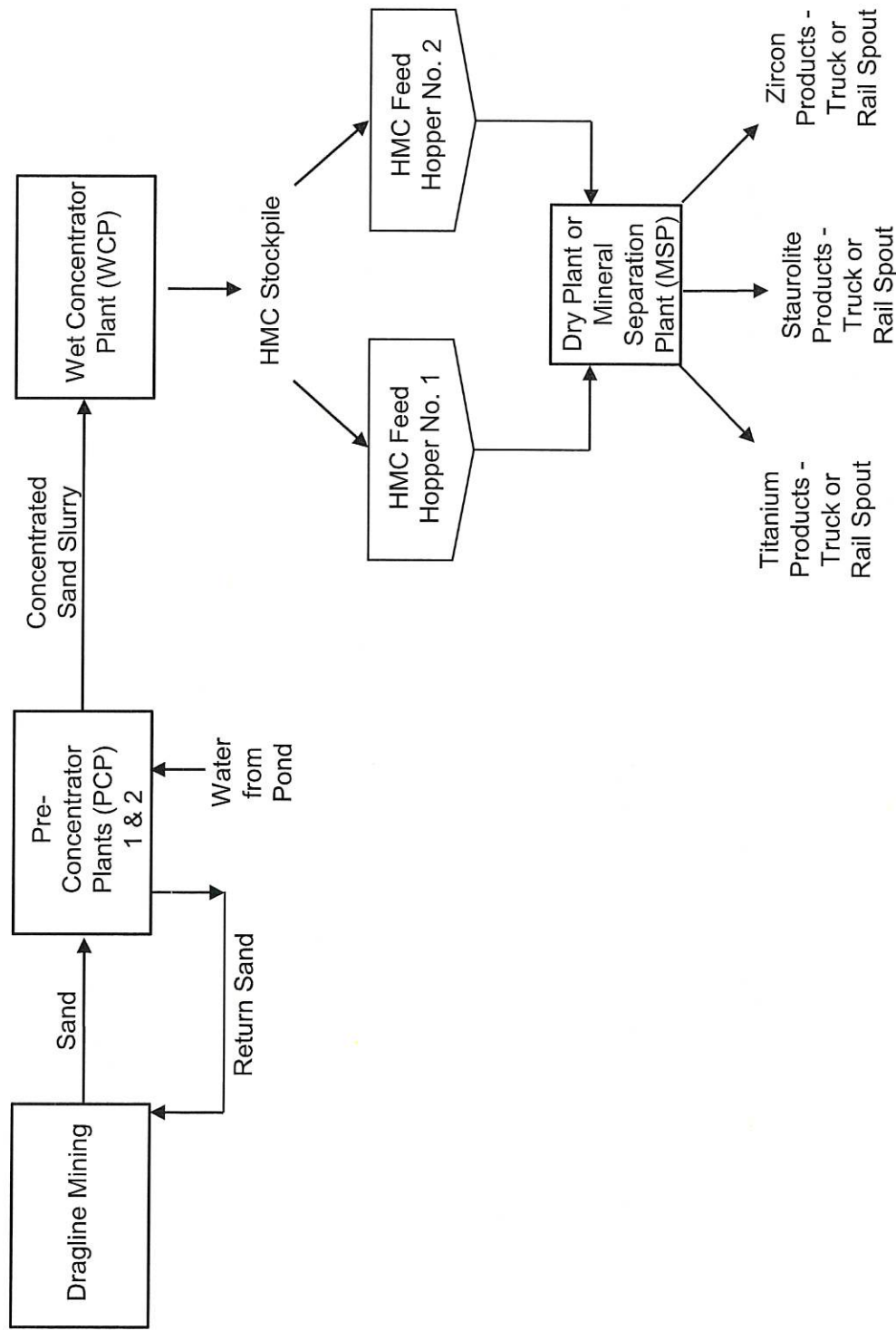
Emission Source Code	Emission Source Description	Detailed Source Code	Direct Control (Y/N)?	Control Device Code	Collection Point Code	Comments
Point Sources Subject to 40 CFR Part 60 Subpart LL						
Dryers						
DY01C	HMC Dryer No. 1 (Combustion Emissions)		N	Uncontrolled		Dryer combustion stacks
DY02C	Zircon Dryer (Combustion Emissions)		N	Uncontrolled		
DY04C	HMC Dryer No. 2 (Combustion Emissions)		N	Uncontrolled		
DY01	HMC Dryer No. 1 (Process Emissions)		Y	SB01		Dryer process/scrubber stacks. Wet Dynamic Dust Scrubbers SB01 and SB02 control emissions.
RH01	Secondary HTS Feed Reheater No. 1		Y	SB01		
RH02	Secondary HTS Feed Reheater No. 2		Y	SB01		
DY02	Zircon Dryer (Process Emissions)		Y	SB01		
DY04	HMC Dryer No. 2 (Process Emissions)		Y	SB02		
Bucket Elevators						
BE10	Titanium HTS Feed Bucket Elevator	691BE10	N	DC03	CP32,	Controlled by Baghouse 3 (DC03) through
BE12	Titanium Product Bucket Elevator No. 1	791BE12	N	DC03	CP35	Controlled by Baghouse 3 (DC03) through CP35
BE13	Titanium Product Bucket Elevator No. 2	791BE13	N	DC03	CP35	Controlled by Baghouse 3 (DC03) through CP35
BE07	Staurolite Circuit Feed Bucket Elevator	681BE07	N	DC03	CP27, CP28, CP29	Controlled by Baghouse 3 (DC03) through CP27, CP28, CP29
BE08	Staurolite Product Bucket Elevator No. 1	681BE08	N	DC03	CP27, CP28, CP29	Controlled by Baghouse 3 (DC03) through CP27, CP28, CP29
BE09	Staurolite Product Bucket Elevator No. 2	781BE09	N	DC03	CP27, CP28, CP29	Controlled by Baghouse 3 (DC03) through CP27, CP28, CP29
BE01	Primary HTS Bucket Elevator 1	621BE01	Y	DC01	CP01	Controlled by Baghouse 1 (DC01) through CP01
BE02	Primary HTS Bucket Elevator 2	621BE02	Y	DC01	CP02	Controlled by Baghouse 1 (DC01) through CP02
BE03	Zircon HTS Bucket Elevator	631BE03	Y	DC01	CP08	Controlled by Baghouse 1 (DC01) through CP08
BE04	Zircon Bagging Bucket Elevator	631BE04	Y	DC01	CP09	Controlled by Baghouse 1 (DC01) through CP09
BE05	Zircon Product Bucket Elevator No. 1	621BE05	Y	DC01	CP12	Controlled by Baghouse 1 (DC01) through CP12
BE14	Zircon Product Bucket Elevator No. 2	761BE14	N		N/A	Controlled indirectly by baghouses
Conveyor Belts						
CV01	HMC Dryer Feeder Conveyor No. 1	671CV01	N	SB01	N/A	Controlled by Scrubber SB01 through Dryer DY01
CV25	HMC Dryer Feeder Conveyor No. 2	661CV25	N	SB02	N/A	Controlled by Scrubber SB02 through Dryer DY04
Storage Bins (Baghouse Controlled)						
BN04	Secondary HTS Overflow Bin	623BN04	N	DC01	CP01	Controlled by Baghouse 1 (DC01) through CP01
BN08	Zircon HTS Overflow Bin	632BN08	N	DC01	CP08	Controlled by Baghouse 1 (DC01) through CP08
BN09	Zircon Bagging Surge Bin	633BN09	N	DC01	CP14	Controlled by Baghouse 1 (DC01) through CP14
BN16	Staurolite Circuit Feed Surge Bin	682BN16	N	DC03	CP27	Controlled by Baghouse 3 (DC03) through
BN18	Titanium HTS Feed Surge Bin	693BN18	N	DC03	CP32	Controlled by Baghouse 3 (DC03) through CP32
BN12	Titanium Sample Bin No. 1	791BN12	N	DC03	CP35	Controlled by Baghouse 3 (DC03) through CP35
BN23	Titanium Sample Bin No. 2	791BN23	N	DC03	CP35	Controlled by Baghouse 3 (DC03) through CP35
Product Bins						
BN10	Zircon Product Bins (3)	761BN10	N	None	CP12	Emits through uncontrolled stack outside bldg
BN13	Staurolite Product Bins (3)		N	None		Emits through uncontrolled stack outside bldg
BN14	Titanium Product Bins (3)	791BN14	N	None	CP35	Emits through uncontrolled stack outside bldg
Screens						
SC01	HMC Trash Screen	611SC01	Y	DC01	CP15	Controlled by Baghouse 1 (DC01) through CP15
Product Packaging Stations						
H001	Zircon Bagging Facility Bag Handler	631H001	Y	DC01	CP14	Controlled by Baghouse 1 (DC01) through CP14
H002	Staurolite Bagging Facility Bag Handler	681H002	Y	DC03	CP30	Controlled by Baghouse 3 (DC03) through CP30
H003	Titanium Bagging Facility Bag Handler	691H003	Y	DC03	CP35	Controlled by Baghouse 3 (DC03) through CP35

Twin Pines Minerals, LLC
Charlton County, GA - Emission Units MSP

Emission Source Code	Emission Source Description	Detailed Source Code	Direct Control (Y/N)?	Control Device Code	Collection Point Code	Comments
Fugitive Sources Subject to 40 CFR Part 60 Subpart LL						
Emits Inside Building						
BN11	Staurolite Sample Bin No. 1	781BN11				Fugitive emissions (emits to interior of bldg)
BN22	Saurolite Sample Bin No. 2	781BN22				Fugitive emissions (emits to interior of bldg)
HP60	Staurolite Rer HMC Transfer Hopper	600HP60	N			Fugitive emissions
KB01	HMC Trash Screen O/S Kibble	611KB01	N			Fugitive emissions
HP02	Zircon Spirals Feed Hopper	641HP02	N			Wet materials; therefore fugitive emissions are negligible
HP10	MSP Tail Hopper	641HP01	N			Wet materials; therefore fugitive emissions are negligible
BX04	Zircon Filter Feed Hopper Feed Well	631BX04	N			Wet materials; therefore fugitive emissions are negligible
HP04	Zircon Filter Feed Hopper	631HP04	N			Wet materials; therefore fugitive emissions are negligible
HP03	Zircon RC Feed Hopper	641HP03	N			Wet materials; therefore fugitive emissions are negligible
HP65	Zircon IRMS HMC Transfer Hopper	631HP65	N			Wet materials; therefore fugitive emissions are negligible
Emits Outside Building						
HP01	HMC Feed Hopper No. 1	651HP01	N			Fugitive emissions (emits outside of bldg)
HP63	HMC Re-slurrying Hopper	661HP63	N			Fugitive emissions
HP62	HMC Feed Hopper No. 2	661HP62	N			Fugitive emissions (emits outside of bldg)
SC05	HMC Re-slurrying trash screen	641SC05	N			Wet materials; therefore fugitive emissions are negligible
CV07	HMC Re-slurrying Feeder	661CV07	N			Fugitive emissions
HP50	HMC Re-slurrying Transfer Hopper	661HP50	N			Wet materials; therefore fugitive emissions are negligible
Loading Areas						
	Titanium Loading Area					Fugitive emissions
	Staurolite Loading Area					Fugitive emissions
	Zircon Loading Area					Fugitive emissions

APPENDIX D

Figures



400 Northridge Road, Suite 400
Sandy Springs, GA 30350
Phone (404) 315-9113



TWIN PINES MINERALS, LLC
6874 Hwy 94
St. George, GA 31562

PROCESS FLOW DIAGRAM

FIGURE
1



**PROPOSED
SITE**



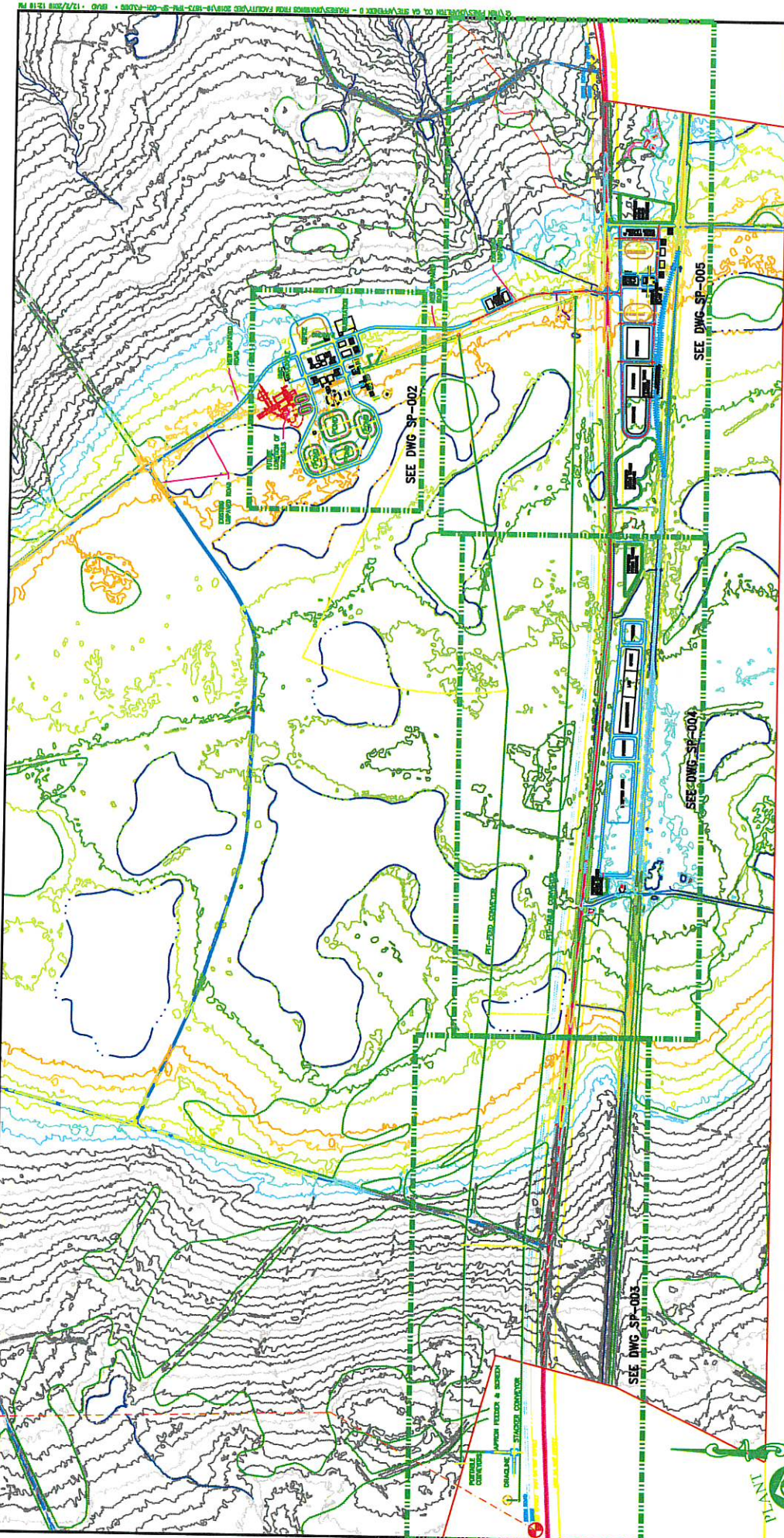
400 Northridge Road, Suite 400
Sandy Springs, GA 30350
Phone (404) 315-9113



TWIN PINES MINERALS, LLC
6874 Hwy 94
St. George, GA 31562

GENERAL AREA MAP

**FIGURE
2**



OVERALL SITE PLAN

PROPOSED FOR:

TWIN PINES MINERALS, LLC
 2100 SOUTHBRIAR PARKWAY
 SUITE 540
 BIRMINGHAM, ALABAMA 35209

PREPARED BY:

FEDINC
 FLORIDA ENGINEERING AND DESIGN, INC.
 255 COUNTY ROAD 655 SOUTH
 BARTON, FLORIDA 33530-7702
 TEL: (863) 865-6363
 FAX: (863) 867-1773

DATE: 12/12/2019

BY: [Signature]

SCALE: 1" = 100'

PROJECT NO.: SP-001

CLIENT: TWIN PINES MINERALS, LLC

REVISIONS:

NO.	DATE	DESCRIPTION
1	12/12/19	ISSUED FOR CLIENT REVIEW
2	12/12/19	ISSUED FOR CLIENT REVIEW
3	12/12/19	ISSUED FOR CLIENT REVIEW
4	12/12/19	ISSUED FOR CLIENT REVIEW

STATUS:

12/12/19: ISSUED FOR CLIENT REVIEW

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NOTES:

1. SEE DWG SP-002

2. SEE DWG SP-003

3. SEE DWG SP-004

4. SEE DWG SP-005

LEGEND:

PROPOSED STRUCTURE

EXISTING STRUCTURE

PROPOSED ROAD


EXISTING ROAD

PROPOSED LOT

EXISTING LOT

APPENDIX E

Manufacturer's Documentation

	ANSAC VSS1760 WET DUST SCRUBBER TECHNICAL DATASHEET		Doc No. : T1961-1-01-3 Revision : 0 Date : 27-01-2016
General			
ANSAC Reference No.	:	T1961	
Client	:	Sedgman Ltd	
Model No.	:	VSS1760	
Project	:	Twin Pines Mineral Sands Project	
Site Location	:	Florida,U.S.A.	
Site Ambient Temperature	°C	:	Min. -14 / Max. 27
Design Capacity	m ³ /hr	:	1908
Scrubber Specifications			
Equipment Description	:	Wet dust scrubber with fresh air bleed damper, spray nozzles and separate air intake fan.	
Equipment Number	:	600SB02	
Duty	:	Continuous reduction dust content of process gas from mineral sands dryers via once-through scrubbing with water.	
Number of Units	:	One (1)	
Materials of Construction	:	Stainless Steel 304 (wetted parts) Mild Steel with surface treatment (non-wetted parts)	
Dimensions	mm	:	2300 Length x 1100 Width x 2800 Height Gas discharge Ø500 Stack height TBC
Process Parameters			
Feed Description	:	Steam with entrained fine silica particles (dust)	
Feed Temperature (approx.)	°C	:	110
Feed Density (approx.)	kg/m ³	:	0.58
Design Capacity	m ³ /hr	:	1908 (process gas from 600DY04)
Design Product Throughput	:	100% of collected dust product (no dust storage)	
Performance Parameters			
Dust Removal Efficiencies (by Particulate Size)	1 µm	:	98.5%
	2 µm	:	99.5%
	5 µm	:	99.9%
	10 µm	:	99.9%
PM10 Gas Requirements	:	Effluent dust concentration <50 mg/m ³	
Intake Air Fan			
Equipment Description	:	Dust/water-capable centrifugal paddle fan	
Number of Units	:	One (1)	
Duty	:	Continuous supply of intake air to scrubber chamber	
Nominal Air Flow Rate	Nm ³ /hr	:	27000
Static Pressure	kPa	:	2.5 (approx.)
Motor Power	kW	:	5.5 (approx.)
Drive	:	Vee Belt arrangement or equivalent	
Electrical			
Main Supply	:	480 V AC / 60 Hz (three phase)	
Comments			
1. Dust Scrubber Recycle Pumps not applicable. ANSAC Scrubber has integral scrubbing fan and water injection within unit for once-through operation.			
2. Fresh air bleed damper control instrumentation to be confirmed in detailed engineering.			

Dust Extractor Supplier Technical Response

PROJECT No:		Donaldson	
PROJECT NAME:		Twin Pines Mineral Sands Project	
DOCUMENT No:		Donaldson DFO2-8--A310-D05-07155-DS-0021_A Dust ExtractionTR	
CONTRACT PACKAGE No:		Donaldson/07155	
CONTRACT PACKAGE TITLE:		Supply of Dust Extractor Supplier Technical Response	
PLANT AREA:		MSP	
2.00 PERFORMANCE GUARANTEE			
2.01	Maximum emission level that the equipment is required to discharge to the atmosphere.	50mg/Nm ³	
EQUIPMENT DATA QUESTIONNAIRE			
3.00	BAGHOUSE SCHEDULE OF TECHNICAL INFORMATION	UNITS	Comments
3.01	SUPPLIER/CONTRACTOR		*
3.02	SUPPLIER/CONTRACTOR'S BROCHURE		*
3.03	SUPPLIER/CONTRACTOR GA DRG No.		*
3.04	MODEL		DFO2-8
3.05	AIR USAGE (CLEAN & DRY @ 650 kPa)		
3.06	MAXIMUM	(Nm ³ /h)	17.3
3.07	MINIMUM	(Nm ³ /h)	/
3.08	BASIC BAGHOUSE ASSEMBLY DIMENSIONS		
3.09	WIDTH (mm)		2133.6
3.10	LENGTH (mm)		1143
3.11	OVERALL HEIGHT / SIDE WALL HEIGHT (mm)		3246.1
3.12	MAX. NORMAL OPERATING NOISE LEVEL @ 1 m (dBa)		85
3.13	TOTAL ASSEMBLY MASS (ton)		0.7251
4.00	Dust collectors		Equipment No. 600DC01
4.01	NUMBER OF COMPARTMENTS		8
4.02	DESIGN FEED GAS FLOW	(Nm ³ /h)	4520
4.03	DESIGN GAS TEMPERATURE	(°C)	77
4.04	DESIGN DUST LOADING	(g/m ³)	30
4.05	EMISSIONS	(mg/Nm ³)	15
4.06	ACTUAL AIR/CLOTH RATIO	(m/min)	0.53
4.07	PRESSURE DROP		
4.08	CLEAN	(KPa)	250
4.09	DIRTY	(KPa)	1200
4.10	PLATE MATERIAL SPECIFICATION		carbon steel
4.11	PLATE MATERIAL THICKNESS	(mm)	3
4.12	DESCRIPTION OF INSULATION / TRACING OF WALLS		*
4.13	CONTROL PANEL ENCLOSURE MATERIAL		*
4.14	CONTROL PANEL SIZE (L x W x H)	(mm)	*
4.15	CONTROL PANEL VOLTAGE		105~120V 200~240V 1Ph 50-60Hz
4.16	CONTROL PANEL IP RATING		IP56
5.00	filter cartridge		
5.01	filter cartridge MATERIAL		Ultra-Web
5.02	filter cartridge SIZE	(mm)	350
5.03	filter cartridge LENGTH	(mm)	660
5.04	AREA	(m ²)	15
5.05	No. of Valves		8
5.06	Filter Area	(m ²)	141.2
5.07	BAG PATTERN		
5.08	MAXIMUM CONTINUOUS WORKING TEMPERATURE	(°C)	80
5.09	MAXIMUM SURGE WORKING TEMPERATURE	(°C)	*
5.10	BAG CLEANING METHOD		Jet-pulse
5.11	FREQUENCY OF BAG CLEANING		10s
5.12	MINIMUM LIFE	(h)	4000
5.13	DESCRIPTION OF CORROSION PROTECTION (ACID DEW POINT)		
6.00	ROTARY VALVE		Equipment No. 600VA01
6.01	MANUFACTURER		
6.02	MODEL No		
6.03	THROUGHPUT		
6.04	DESIGN	(t/h)	
6.05	MAXIMUM	(t/h)	
6.06	CASING MATERIAL		
6.07	VANE MATERIAL		
6.08	SEAL DETAILS		
6.09	DISCHARGE SOCK MATERIAL		
6.10	DISCHARGE SOCK THICKNESS	(mm)	
6.11	DISCHARGE SOCK CLAMP TYPE / MATERIAL		
6.12	DRIVE ARRANGEMENT		
6.13	HEIGHT OF VALVE UNDERSIDE ABOVE GROUND (m)		
6.14	DESCRIPTION OF CORROSION PROTECTION (ACID DEW POINT)		
6.15	MOTOR		
6.16	MANUFACTURER		
6.17	TYPE / MODEL No.		
6.18	FRAME SIZE		
6.19	VOLTAGE / PHASES / No. POLES		
6.20	STARTING (e.g. DOL, etc)		
6.21	RATED POWER (kW)		
6.22	RATED POWER @ NOMINAL RATE (kW)		
6.23	RATED POWER @ MAXIMUM RATE (kW)		
6.24	MOUNTING TYPE, CONSTRUCTION		
6.25	MASS OF MOTOR (kg)		
6.26	FULL LOAD SPEED (rpm)		
6.27	FULL LOAD AMPS		*
6.28	LOCKED ROTOR TORQUE / LOCKED ROTOR AMPS (N-m)/(A)		* / *
6.29	PULL-UP TORQUE (N-m)		*
6.30	PULL-OUT TORQUE (N-m)		*
6.31	INSULATION CLASS		*

Dust Extractor Supplier Technical Response

PROJECT No:		Donaldson	
PROJECT NAME:		Twin Pines Mineral Sands Project	
DOCUMENT No:		Donaldson DFO2-8--A310-D05-07155-DS-0021_A Dust ExtractionTR	
CONTRACT PACKAGE No:		Donaldson/07155	
CONTRACT PACKAGE TITLE:		Supply of Dust Extractor Supplier Technical Response	
PLANT AREA:		MSP	
6.32	ACTUAL TEMPERATURE RISE AT MCR/40° C AMB.	(°C)	*
6.33	IP RATING		*
6.34	DIRECTION OF ROTATION (Facing drive end)		*
6.35	TERMINAL BOX LOCATION (facing drive end)		*
6.36	NOISE LEVEL @ 1 m	(dBA)	*
6.37	MOTOR THERMISTORS		*
6.38	QUANTITY		*
6.39	TYPE		*
6.40	THERMISTOR SETPOINT TEMPERATURE (°C)		*
6.41	MOTOR HEATER (YES/NO)		*
6.42	EXPECTED LIFE @ NOMINATED LOAD CONDITIONS (h)		*
6.43	LUBRICANT TYPE / DESCRIPTION		* / *
6.44	SPEED CONTROL		*
6.45	MOTOR INERTIA	(Kg-m)	*
6.46	GEARBOX		*
6.47	MANUFACTURER		*
6.48	MODEL / PART NUMBER		*
6.49	VENDOR DRAWING NUMBER		*
6.50	TYPE		*
6.51	INPUT SPEED	(rpm)	*
6.52	OUTPUT SPEED	(rpm)	*
6.53	SPEED RATIO		*
6.54	NUMBER OF STAGES		*
6.55	LUBRICATION METHOD		*
6.56	OIL TYPE		*
6.57	AGMA QUALITY STANDARD		*
6.58	INERTIA	(Kg-m)	*
6.59	THERMAL RATING	(KW)	*
6.60	MECHANICAL RATING	(KW @ rpm)	*
6.61	SERVICE FACTOR		*
6.62	ESTIMATED LIFE @ RATED POWER	(h)	*
6.63	BEARING ESTIMATED L ₁₀ LIFE @ RATED POWER	(h)	*
7.00	EXHAUST FAN		Equipment No. 600FN03
7.01	MANUFACTURER		New York Blower
7.02	MODEL No		
7.03	TYPE		*
7.04	FAN ARRANGEMENT DETAILS		*
7.05	FAN FLOW DESIGN DUTY	(Nm³/h)	4520
7.06	MAXIMUM AIRFLOW RATE	(Nm³/h)	4520
7.07	FAN STATIC PRESSURE DUTY	(kPa @ °C)	2.8KPa
7.08	IMPELLER MATERIAL		*
7.09	IMPELLER DIAMETER	(mm)	*
7.10	CASING MATERIAL		*
7.11	CASING THICKNESS	(mm)	*
7.12	DESIGN TEMPERATURE	(° C)	*
7.13	MAXIMUM OPERATING TEMPERATURE	(° C)	*
7.14	FAN OUTLET SILENCER		*
7.15	SILENCER PRESSURE LOSS (kPa)		*
7.16	DESCRIPTION OF CORROSION PROTECTION (ACID DEW POINT)		*
7.17	DUCTING + HOODWORK STATIC PRESSURE REQUIREMENT (kPag)		*
7.18	MOTOR		*
7.19	MANUFACTURER		*
7.20	TYPE / MODEL No.		* / *
7.21	FRAME SIZE		*
7.22	VOLTAGE / PHASES / No. POLES		* / * / *
7.23	STARTING (e.g. DOL, etc)		*
7.24	RATED POWER (kW)		7.5
7.25	RATED POWER @ NOMINAL RATE (kW)		*
7.26	RATED POWER @ MAXIMUM RATE (kW)		*
7.27	MOUNTING TYPE, CONSTRUCTION		*
7.28	MASS OF MOTOR	(kg)	*
7.29	FULL LOAD SPEED (rpm)		*
7.30	FULL LOAD AMPS		*
7.31	LOCKED ROTOR TORQUE / LOCKED ROTOR AMPS (N-m)/(A)		* / *
7.32	PULL-UP TORQUE (N-m)		*
7.33	PULL-OUT TORQUE (N-m)		*
7.34	INSULATION CLASS		*
7.35	ACTUAL TEMPERATURE RISE AT MCR/40° C AMB.	(°C)	*
7.36	IP RATING		*
7.37	DIRECTION OF ROTATION (Facing drive end)		*
7.38	TERMINAL BOX LOCATION (facing drive end)		*
7.39	NOISE LEVEL @ 1 m (FAN, MOTOR AND SILENCER)	(dBA)	* / * / *
7.40	MOTOR THERMISTORS		*
7.41	QUANTITY		*
7.42	TYPE		*
7.43	THERMISTOR SETPOINT TEMPERATURE (°C)		*
7.44	MOTOR HEATER (YES/NO)		*
7.45	EXPECTED LIFE @ NOMINATED LOAD CONDITIONS	(h)	*
7.46	LUBRICANT TYPE / DESCRIPTION		* / *
7.47	MOTOR INERTIA	(Kg-m)	*
7.48	VEE-BELT DRIVE		*

		SEDGMAN	
		Dust Extractor Supplier Technical Response	
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CONTRACT PACKAGE No:		Donaldson/07155	
CONTRACT PACKAGE TITLE:		Supply of Dust Extractor Supplier Technical Response	
PLANT AREA:		MSP	
7.49	PULLEY MANUFACTURER		*
7.50	DRIVE PULLEY DIAMETER	(mm)	*
7.51	DRIVEN PULLEY DIAMETER	(mm)	*
7.52	MODELS / PART NUMBERS		*
7.53	BELT MANUFACTURER		*
7.54	NUMBER OF BELTS		*
7.55	VEE BELT TYPE		*
7.56	MODEL / PART NUMBER		*
8.00	EXHAUST STACK		
8.01	HEIGHT	(m)	*
8.02	CONSTRUCTION MATERIAL		*
8.03	THICKNESS	(mm)	*
8.04	DIAMETER	(mm)	*
8.05	INSULATION DESCRIPTION		*
9.00	DUCTING		
9.01	MATERIAL SPECIFICATION		*
9.02	THICKNESS	(mm)	*
9.03	DIAMETER	(mm)	*
9.04	DESCRIPTION OF CORROSION PROTECTION (ACID DEW POINT)		*
9.05	THERMAL INSULATION MATERIAL SPECIFICATION		*
9.06	THERMAL INSULATION THICKNESS	(mm)	*
9.07	DESCRIPTION OF DUCTWORK DAMPER (if required)		*
9.08	CLEAN OUT AND INSPECTION HATCHES DESCRIPTION		*
10.00	PAINTING AND SURFACE PROTECTION		
10.01	EXPOSED MACHINED SURFACES		*
10.02	ALL INTERNAL AND EXTERNAL EXPOSED SURFACES		
10.03	SURFACE PREPARATION		*
10.04	PRIME COAT SPECIFICATION / DRY FILM THICKNESS (µm)		* / *
10.05	INTERMEDIATE COAT(S) / DRY FILM THICKNESS(ES) (µm)		* / *
10.06	FINISH COAT / DRY FILM THICKNESS (µm)		* / *
10.07	FINISH COAT COLOUR		*
10.08	ALL EXTERNAL EXPOSED SURFACES		
10.09	SURFACE PREPARATION		*
10.10	PRIME COAT SPECIFICATION / DRY FILM THICKNESS (µm)		* / *
10.11	INTERMEDIATE COAT(S) / DRY FILM THICKNESS(ES) (µm)		* / *
10.12	FINISH COAT / DRY FILM THICKNESS (µm)		* / *
10.13	FINISH COAT COLOUR		*
11.00	INSTRUMENTATION AND CONTROL		
11.01	BAG CLEANING TIMER DESCRIPTION		IPC DP
11.02	SOLENOID VALVE DESCRIPTION		GOYEN
11.03	PRESSURE REGULATOR DESCRIPTION		Donaldson
11.04	DESCRIPTION OF OTHER INSTRUMENTATION / CONTROL		
12.00	NOTES		