DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

N566347558

FACILITY: NITREX METAL TECHNOLOGIES INC		**SRN / ID:** N5663
LOCATION: 822 KIM DR, MASON		**DISTRICT:** Lansing
CITY: MASON		**COUNTY:** INGHAM
CONTACT: Jason Barrett , Health and Safety Coordinator		**ACTIVITY DATE:** 01/10/2019
STAFF: Michelle Luplow	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MINOR
SUBJECT: Unannounced, scheduled compliance inspection to determine compliance with PTI 357-95.		
RESOLVED COMPLAINTS:		

Inspected by: Michelle Luplow (author) and Candra Wilcox (DEQ Admin)

Personnel Present: Jason Barrett, Health and Safety Coordinator (Jason.barrett@nitrex.com)
Jerry Snow, Maintenance Manager (jerry.snow@nitrex.com)

Personnel Not Present: Jason Orosz, VP Heat Treating Services (jason.orosz@nitrex.com)

Purpose
Conduct an unannounced, scheduled compliance inspection of Nitrex Inc to determine compliance with PTI No 357-95 (supplemental revision) for an ammonia nitriding process. This facility was last inspected in January 2010.

Facility Background
Nitrex heat treats steal using an ammonia nitriding process. Ammonia, which supplies the nitrogen for this process, comes into contact with heated steal, causing it to dissociate into nitrogen and hydrogen. The nitrogen diffuses into the steel, creating a nitride layer.

Jason Barrett, H&S Coordinator, said that Nitrex operates one 8-hr shift 5-6 days per week, depending on industry fluctuations.

Inspection
Candra Wilcox and I arrived at Nitrex at approximately 10:00 a.m. January 10, 2019 and met with Jason Barrett and Jerry Snow. I provided J. Barrett with a January 2017 Permit to Install Exemptions handbook, a PFAS outreach brochure, and a SARA Title III outreach brochure. I explained that the Air Quality Division had not inspected the facility since 2010 under PTI 357-95, which was the reason why we came out for the inspection that day. I explained to J. Snow that we are required, per our commitment to the EPA, that inspections be conducted unannounced.

J. Barrett and J. Snow provided us with a tour of the facility, which included observation of the permitted pieces of equipment.

Table 1 contains a list of all permitted and exempt equipment which were identified during the inspection.

Table 1. Equipment located onsite

Unit	Description	PTI/ Exemption	Federal Regulation	Compliance Status
3 Nitriding Furnaces	**Furnaces utilizing anhydrous ammonia to nitride the steal**	**PTI 357-95**	**NA**	**Compliance**
6 Nitriding Furnaces	**Furnaces utilizing anhydrous ammonia to nitride steel. These furnaces were installed after the 18-month window for installation, once a PTI has been issued (see Table 2). Equipment can be considered exempt under pre-December 20, 2016 exemption Rules**	**Rule 282(a)(i)** **(pre-12/20/16)**	**NA**	**Compliance**
1 Nitriding Furnace (under construction)	**Installation has begun on a new nitriding furnace (post-December 20, 2016). Company needs to submit a PTI application by 2/1/19, otherwise a violation notice will be issued.**	**PTI Application to be submitted**	**NA**	**Pending**

4 Gas-neutralizing units (afterburners)	Natural gas-fired units used to combust the residual NH3 from the nitriding furnaces, prior to exhausting the gas stream to ambient air.	PTI 357-95	NA	Compliance
Anhydrous Ammonia Tank	200-gallon NH3 storage tank used as a process gas in the nitriding furnaces	PTI 357-95	NA	Compliance
1 Emergency Generator	80 hp Kohler natural gas-fired generator used in emergencies (power loss) used to run their computer operating systems. Unit is much less than 10 MMBtu/hr and therefore exempt. Installed in 2008. Manufactured before 2008.	Rule 285(2)(g)	NSPS Subpart JJJJ	Compliance
3 Wash Stations	1 dip tank 2 automated washers w/ natural gas-fired dryer, only 1 is used Units are used to clean off grease, dirt, oils from the parts prior to treatment in the nitriding furnaces Vented to outside atmosphere.	Rule 281(2)(e)	NA	Compliance
1 Natural gas-fired Parts Dryer	Natural gas-fired dryer associated with the automated parts washer stations	Rule 281(2)(e)	NA	Compliance

PTI 357-95 (supplemental revision)

Furnaces
PTI 35-95 encompasses the anhydrous ammonia tank and nitriding process (including the nitriding furnaces and gas neutralization after burners). Although the PTI and PTI application do not specify the quantity of furnaces or gas neutralization afterburners that were permitted, any equipment that was installed over 18 months since the permit was issued (November 1995) would need to be permitted under additional permits if there are no applicable exemptions that can be used.

Under the Permit Exemption Rules promulgated before December 20, 2018, metal heat treating furnaces rated at less than 10 MMBtu/hr, that fire sweet natural gas, and that treat metals that are not coated with oil can be exempt from a permit to install under Rule 282(a)(i). Table 2 lists all nitriding furnaces installed before December 20, 2016. All are under 10 MMBtu/hr, all are fired with sweet natural gas, and all treat parts that are clean (not oil-coated). Parts are washed in one of 3 parts washers prior to being treated in a nitriding furnace. The 3 furnaces (M1, M2, and M3) were likely installed under PTI 357-95. The remaining furnaces would be allowed to be installed under Rule 282(a)(i).

Table 2. List of exempt furnaces

Nitriding Furnace ID	Btu/hr	Installation Date
M1	853,035	1997
M2	214,965	1997
M3	818,914	1997
M4	511,821	1998
M7	81,891	2005
M8	1,719,719	2005
M9	511,821	2006
M10	784,793	2004
M11	783,087	2012

The newest nitriding furnace was recently installed in its permanent location. Although it is not operational, the footings have been installed and it is fixed in its permanent place. Like the other 9 furnaces, this furnace will use anhydrous ammonia to treat the steel parts. This unit was installed after the promulgation of the new PTI exemption rules and therefore Rule 282(2)(a)(i) can no longer apply, as the Rule now specifies that metal heat treating that does not involve ammonia is exempt. I have given Nitrex until February 1, 2019 to submit a permit to install application for this furnace. Failure to do so within this time frame will likely result in the issuance of a violation notice for Rule 201.

Nitrex is required to implement an inspection and maintenance plan for the facility (nitriding furnaces, gas neutralization afterburners, anhydrous ammonia tank).

J. Barrett provided me with a copy of Nitrex's "Predictive/Preventative Maintenance Daily Walk Through" sheet (see attached). He said that if there are noted problems for any one of their categories, they inform Jerry Snow of the issue to resolve the problem. The sheet includes verifying that the neutralizer panel (for gas neutralization afterburners) is operating and to check the alarms and the proper heat settings), checking of the furnace filters, and the processes that allow the furnaces to operate (such as fuel flows, etc). Additionally they have checks for the anhydrous ammonia tank (leaks, rust, line checks, smell check, etc).

In addition to daily checks, J. Snow showed me how his computer monitors each of the furnaces and associated afterburners. All furnaces have alarm systems (audio and visual) that are connected to the interface on his computer for instances where the afterburner flames go out. The alarm system will shut the anhydrous ammonia gas flow off. A nitrogen purge is used in the furnaces in these cases, displacing the residual ammonia, and exhausting the ammonia out through the stack. The furnace does not shut down during these instances.

Anhydrous Ammonia
The anhydrous ammonia tank has a capacity of 200 gallons.

Ammonia emission rates from the nitriding process post-control are limited to 0.53 lb/hr. Testing to verify this emission rate is required if requested by the AQD. At this time it is my professional judgment that testing is not required to verify ammonia emission rates. Based on the evaluation discussed below, Nitrex is operating below their material usage limits and appears to be operating and maintaining the control equipment properly.

Nitrex is limited to 345,000 lbs of ammonia per 12-month rolling period. Nitrex provided me monthly records of ammonia purchased for calendar years 2017 and 2018. Using purchase orders rather than actual usage is likely overestimating usage for each month. I explained to J. Orosz that overestimations are acceptable, as long as they do not result in exceeding the material limits. I explained to him that if they start to see their 12-month rolling averages getting near the material limit, they should start to record actual usage on a monthly basis to ensure compliance with the material limit.

The 12-month rolling averages were not calculated. Although calculating these averages is not clearly defined in the permit, I have informed Nitrex that 12-month rolling averages must be calculated using their monthly usage rates in order to ensure compliance with permit limits. I calculated the 12-month rolling averages based on the 2 years of data J. Orosz provided (attached). The 12-month rolling average with the highest material usage was January – December 2018, at 154,500 lbs of anhydrous ammonia. Nitrex is meeting their material limit at this time.

Nitrex is required to operate the anhydrous ammonia tank with a remotely operated internal or external positive shut-off valve for emergency shut-off situations. J. Barrett explained that the shut off of flow from the anhydrous ammonia tank can be done remotely via J. Snow's computer.

A bulkhead, anchorage, or equivalent system is required to be used at the transfer area to ensure any breaks results from a pull will occur at a predictable location, while retaining intact the valves and piping on the plant side of the transfer area. The transfer hookups are situated on a small steel beams structure that I would consider to be an anchorage point.

All transfer operations are required to be performed by a reliable person properly trained and made responsible for proper compliance with all applicable procedures and there should also be a person that is trained in the proper use of equipment. J. Barrett said that Airgas has been contracted to fill the anhydrous ammonia tank. J. Snow indicated that there are no staff other than Airgas present during these transfers. According to Airgas' website, all technicians who perform the transfers follow PSM/RMP/OSHA safety guidelines and would therefore be qualified as a persona properly trained in this practice. I suggested to J. Barrett that at least one Nitrex staffperson, properly trained in anhydrous ammonia, be present to ensure that Airgas is conducting the transfers in compliance with their permit, specifically that their hoses be no longer than 25 ft in length, that the hoses are not older than 5 years, and that any vapor or liquid lines requiring venting after ammonia transfer be vented to a water trap. All 3 of these requirements are contained in the permit.

There were no transfer operations being conducted during the inspection.

Nitrex appears to be in compliance with PTI 357-95 at this time.

Emergency Generator
The emergency generator, which is only used for power back-up to run their IT equipment, including computers during power outages, is subject to the New Source Performance Standards Subpart JJJJ; however, because the engine was ordered after June 12, 2006 (installed in 2008), but manufactured before January 1, 2009, there are no requirements currently in place with the NSPS for this type of unit.

Parts Washers & PFAS
All parts washer listed in Table 1 are vented to atmosphere. I reviewed the SDS for the two cleaning agents used, ChemQuest Power Soak 1022 and ChemQuest PowerClean HDS 1022, to verify that they did not contain VOC's. The two main components of both are KOH (potassium hydroxide) and "wetting agents" listed under CAS #37251-67-5. I will request that Nitrex find out from the manufacturer whether the "wetting agents" listed in the SDS contain PFAS or PFOS compounds.

J. Barret said that the waste cleaning solution is captured into a reservoir that Heritage Crystal Kleen will pump out and remove from site. He said that none of their waste cleaning solutions/wastewater is sent to the wastewater treatment plant.

All parts washers can be considered exempt under Rule 281(2)(e) because they are used to wash and/or dry materials, where the material itself cannot become an air contaminant, there are no VOC's, and only natural gas is burned in the dryers on the automatic washers.

Compliance Statement: Nitrex is currently in compliance with PTI No 357-95. Nitrex is pending compliance with Rule 201 for the 10th nitriding furnace. The PTI application must be in by February 1, 2019 to be in compliance.

NAME _____ DATE 1/23/19 SUPERVISOR _____