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

B719728590

FACILITY: ANR -- Rapid River Compressor Station		SRN / ID: B7197
LOCATION: 2170 Rabourn Rd. NE, KALKASKA		DISTRICT: Gaylord
CITY: KALKASKA		COUNTY: KALKASKA
CONTACT: Brad Stermer , Sr. Environmental Specialist		ACTIVITY DATE: 02/19/2015
STAFF: Bill Rogers	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Compliance inspection, observed stack test, observed natural gas sampling, observed Leak Detection and Repair (LDAR) inspection, record review		
RESOLVED COMPLAINTS:		

On February 19, 2014, I inspected the ANR Storage Company Rapid River Natural Gas Storage Facility. I was there to observe a BTEX emissions test on the thermal oxidizer exhaust and the first inspection of the thermal oxidizer and its backup condenser under their new Leak Detection and Repair (LDAR) Plan. Also, I watched a contractor take annual gas samples for analysis of the natural gas entering the facility. I conducted a compliance inspection while I was on site. A few days earlier, I had obtained records in order to conduct a record review to complete a Full Compliance Evaluation.

I did not observe any violations during any of these activities.

The records I requested were as required by Renewable Operating Permit MI-ROP-B7197-2012. Mr. Brad Sturmer provided these to me. I did not find any violations in reviewing these records.

I had not announced the compliance inspection, but facility personnel knew I would be on site to observe the stack test, the natural gas sampling, and the LDAR Inspection. The compressor and generator engines were not operating at the time of my inspection. The glycol dehydrator was operating. The thermal oxidizer on the glycol dehydrator was operating. The condenser is only to be used as a backup when the thermal oxidizer is not operating, so the condenser was not operating.

Mr. Brad Sturmer provided me with the records I requested. On site, Mr. Ken Price and Mr. Jeff Punjak of ANR, who were there to observe the test and to develop and implement the LDAR Plan, escorted me to the test site. Mr. Price walked through the facility with me when I conducted my inspection.

Weather was extremely cold at the time of my inspection, 15 below zero f at the time I arrived. The cold temperatures caused some trouble during the stack test.

STACK TEST

The stack test was run by Thomas Schmelter and Dillon King of Bureau Veritas. They had set up a sampling trailer near the glycol dehydrator and thermal oxidizer. The sample method used absorbent tubes with a measured volume of stack exhaust pumped through. Condensate was collected in miniature impinger trains. The impingers were 60 ml size and due to the cold weather were cooled with snow from outside rather than the more common ice cubes. Mr. King kept the impingers well supplied with snow.

Mr. King would recover the condensed water and Buerau Veritas would analyze it for VOCs as well. He told me they had two impinger trains, one for the test and one for the spiked sample.

I arrived during the first test run. Mr. Price told me the run had started at 9:45 AM. At the time I arrived the thermal oxidizer was running at 1496 degrees f, according to the readout in the control room.

I went to the sampling trailer, observing gas sampling (described below) along the way. The stack test was underway. Mr. King told me they were having trouble getting the sample because the sample probe was plugging with ice. They hadn't expected this as the sampling line is heated to about 300 degrees f and the probe is in a stack with an exhaust temperature of about 1400 degrees f, with only a few inches of probe exposed to the ambient air between. This separation is necessary because the stack temperature is high enough that it would destroy the Teflon sampling line without some isolation.

Normally this wouldn't be a problem; the sampled gasses could easily get through the probe before they had time to cool enough to freeze. But this day was extremely cold.

For runs 2 and 3 Bureau Veritas used a larger diameter sampling probe, which solved the problem.

During Run 1 they had to stop the test for a while to purge the line. After about 20 minutes they resumed the run at 10:38 and ended the run at about 11:00.

The post-run leak check passed at 0.0 CFM at 5" Hg. I didn't note the pressure during the test, but the pressure needle was near zero, so 5" Hg should have been adequate.

The pre-run leak check for Run 2 passed at 0.0 CFM at 5" Hg. Run 2 started at 11:30.

During Run 2 Mr. Schmelter conducted the LDAR Inspection, described below, and flow measurements on the thermal oxidizer stack. The test was run in one sampling port only because the stack only has one. Mr. Schmelter reached the port using a man lift machine as there is no permanent platform allowing access to the sampling port.

The post-run leak check passed at 0.0 CFM at 5" Hg.

By this time Mr. Jeremy Hoeh of the DEQ AQD Cadillac Office was on site. He said he would observe the third run, so I left the site.

LEAK DETECTION AND REPAIR INSPECTION

ANR has been implementing a LDAR plan at all their facilities. They are tagging the sampling points with yellow tags for normal points and red tags for "difficult or dangerous to monitor" points. I agree that the red-tagged points I saw were truly difficult or dangerous to reach.

Each facility dehydrator shed has its own unique range of point numbers. Those at the Rapid River Facility start at 300.

Bureau Veritas has tagged the inspection points. Mr. Punjak is developing a process diagram with associated photographs to allow ANR personnel to know in advance all the points they will need to monitor during a LDAR Inspction.

Mr. Schmelter of Bureau Veritas and Mr. Price of ANR conducted the first LDAR Inspection, with Mr. Schmelter sampling and Mr. Price recording the results. Mr. Schmelter used a portable FID. Before the test he did a zero, span, and response test. With zero gas, the FID indicated [redacted] 0 ppm. Span gas of 493 ppm gave an indication of 516 ppm. Mr. Schmelter told me the method allows up to 10% error, and a leak would be 500 ppm or greater, so this performance is adequate. The response time for the FID to steady on a reading when challenged with zero or span gas was about 5 seconds or a bit more; Mr. Schmelter said he would assume 10 seconds. The meter would definitely respond before 10 seconds, so that is a safe assumption.

I watched Mr. Schmelter sample all the points inside the dehy building. I noted the three of the points checked. Point 300, a large flange at the top of the dehydrator, background 4 ppm, highest value detected 8 ppm. Point 309, nearby, highest value 6.3 ppm. Point 310, nearby, highest reading 6.3 ppm.

GAS SAMPLING

Mr. Al Savage and Mr. Scott Jones of SPL were on hand to sample the natural gas as it arrives on site from the storage field, between the inlet heaters and the dehydrator. Mr. Savage told me they planned to take two samples in high pressure cylinders, one to analyze for the various hydrocarbons and one to hold as a backup for a year. They would also take a sample in an aluminum bag to analyze for sulfur compounds.

I went with Mr. Savage and Mr. Jones to observe the gas sampling on my way to the stack test, at about 10:00 AM.

Mr. Savage told me they keep the cylinders filled with helium until sampling. He attached each cylinder to a sampling petcock on a gas pipeline. Gas pressure was about 1100 psi, the cylinders are rated at 5000 psi. He filled and purged each cylinder five times before filling the last time with the samples they will take to the lab. After this he attached a regulator to the petcock and used this to supply gas slowly to the aluminum sample bag, which did not appear to be designed to contain any significant pressure.

COMPLIANCE INSPECTION

GLYCOL DEHYDRATOR, Emission Unit EURRGLYDEH

Table E-1-1, EUEXGLYDEH, Conditions III.1 and IV.1, require that the dehydrator shall not be operated unless it is equipped with a thermal oxidizer or a condenser. The dehydrator was equipped with both a thermal oxidizer and a condenser. Plant personnel confirm that their practice is to use the thermal oxidizer, but should that fail they would reroute the exhaust from the dehydrator still to the condenser. Condition III.7 allows this, for a limited number of hours in the year.

Condition III.2 requires condenser exhaust temperature to be 120 degrees f or less when using the condenser to control emissions from the dehydrator. In previous inspections ANR personnel had told me this is the alarm setpoint for the condenser. The condenser is exposed to ambient temperature air, and the dehydrator is used mostly in the coldest months of the year, so it would be difficult for the condenser temperature to exceed 120 degrees f.

Condition III.3 requires thermal oxidizer minimum temperature of 1400 degrees f with a minimum retention time of 0.5 seconds. Mr. Sturmer told me the thermal oxidizers for these facilities send alarms to the operator if temperature drops below 1400 degrees f. On February 11, 2015, ANR sent us a properly certified Dehydration System Alarm Report. covering July 1 through December 31, 2014. It included many alarm incidents. On 11/21/2014 the thermal oxidizer went offline and ANR used the backup condenser instead. They are allowed to do this for a limited number of hours each year. On 11/1/2014 the thermal oxidizer was starting up and was below proper temperature; ANR used the backup condenser. Other alarm incidents were false alarms with the dehydrator not running, or temperatures low enough to trip the alarm but not below the level of 1400 degrees f required in the permit.

Condition III.4 requires a properly operating glycol separator. This is a phase separator to remove glycol from the gas stream as the gas leaves the dehydrator. It is installed properly.

Condition III.5 requires VOC destruction efficiency to be 95% or greater in the thermal oxidizer. Mr. Sturmer provided calculations showing that the destruction efficiency of the thermal oxidizer should be well above 95%. A copy of the calculations is attached. They are for a thermal oxidizer of the same model located at the Blue Lake Facility.

Condition III.6 requires only sweet natural gas fuel for the glycol dehydrator, except that glycol separator emissions may also be burned through the dehydrator burner as a means of reducing air emissions. There was no evidence of any fuel source other than natural gas at this facility. Plant personnel confirmed that the facility stores only commercial quality sweet natural gas, and burns a portion of that gas to power its equipment. This complies with the permit condition.

Condition III.7 requires that there be no stripping gas used in the glycol dehydrator unit. In previous inspections ANR personnel told me they don't use any. .

Condition IV.3 requires a temperature monitor on the thermal oxidizer. I saw the temperature probe for this monitor. I saw temperature readouts in the control room and in the dehydrator building.

Condition IV.4 requires a temperature monitor on the condenser exhaust. I saw the temperature probe for this monitor.

Condition VI.1 requires monitoring alarm events for temperatures outside allowable limits for the control devices on the dehydrator. On February 11, 2015 ANR sent us a properly certified Dehydration System Alarm Report which demonstrates this is being done.

Condition VI.2 requires maintaining calculations showing the destruction efficiency of the thermal oxidizer is at least 95%. Mr. Sturmer provided me such calculations for the thermal oxidizer at the original Blue Lake facility. As the thermal oxidizers are the same model, this is sufficient to satisfy the permit condition.

Condition VI.3 requires monitoring hours of operation of the dehydrator for each calendar month and 12 month rolling time period. A Dehydration System Rolling Total Monitoring Report is attached. It meets this requirement. From March 2014 through February 2015 thus far the Rapid River Dehydration System ran 1313.5 hours using the thermal oxidizer and 115.0 hours using the condenser.

Condition VI.4 requires recording what control device is in use for the dehy for each calendar day. This information is included in the Monthly Dehydration System Monitoring Report. This report for January 2015 is attached.

Condition VI.5 requires recording gas throughput each day. This information is in the Monthly Dehydration System Monitoring Report, attached.

Condition VI.6 requires calculating VOC emissions per day at the end of each calendar month. VOC emissions per day are included in the Monthly Dehydration System Monitoring Report, attached.

Condition VIII.1 requires the condenser stack have a maximum diameter of 2 inches and a minimum height of 20 feet. Condition VIII.2 requires the thermal oxidizer stack have a minimum height of 20 feet; it does not set any diameter for that stack. The stacks appeared to comply with these conditions.

COMPRESSOR ENGINES, Flexible Group FGRRCOMP

Condition VI.1 requires keeping records of preventative maintenance. I examined the log in a notebook in the control room and confirmed it is being kept..

Condition VIII.1 and 2 require the compressor engine stacks to hae a maximum diameter of 30 inches and a minimum height of 49.2 feet. The stacks appeared to comply with these conditions.

The engines are Ingersoll Rand 410 KVR models. They appear well maintained. They appear unchanged from previous inspections.

OTHER EQUIPMENT:

The facility has some tanks that are exempt from permitting requirements, including two 400 barrel methanol tanks and two brine tanks of perhaps 200 barrel capacity. These appear unchanged from previous inspections.

The facility has two natural gas withdrawl heaters rated at 6.5 million BTU/hour heat input. These appear unchanged from previous inspections.

The facility has two Waukesha engines used to run electrical generators. Their stacks appeared to be approximately 20 feet high and 6 or 8 inches in diameter. They appear unchanged from previous inspections.

Maintenance appears good.

NAME William J Rogers Jr. DATE 2/20/2015 SUPERVISOR