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Memorandum

DATE: March 4, 2016

To: Ted Schooley, Permitting Programs Section Chief 

FROM: Robert Samaniego, Major Sources Permitting Program Manager 

SUBJECT: Guidance and Clarification Regarding Applicability of 20.2.35 NMAC

Abstract

This regulation has historically been a source of confusion regarding the definition of “sulfur released in plant processes,” applicability to natural gas processing plants utilizing acid gas injection (AGI), and applicability during periods of permitted Startup, Shutdown, Maintenance and Malfunction (SSM & M). This memorandum is intended to clarify these issues. The conclusions are based on a review of the transcripts of EIB Hearing number 73-11-08, dated November 8 - 10, 1973, and a review of the original versions of AQCR 621, filed on July 15, 1974, and AQCR 801, filed on January 27, 1970.

Overview

The predecessor to 20.2.35 NMAC was first promulgated as AQCR 621 on July 15, 1974. While there were natural gas processing plants in New Mexico at that time that operated sulfur recovery units (SRUs), the majority of the facilities flared all of the sulfur that was released in plant processes.

The intent of the rule was (is) the following:

1. Require a reduction in sulfur emissions to the atmosphere for existing natural gas processing plants (constructed before July 1, 1974) that released an average of 7.5 or more tons per day of sulfur in plant processes, and that were emitting all of this sulfur to the atmosphere. This reduction was to be achieved through the installation of a SRU on or before January 1, 1976.
2. Require sulfur recovery for new natural gas processing plants (constructed on or after July 1, 1974) that release an average of 5 or more tons per day of sulfur in plant processes, and would otherwise emit all of this sulfur to the atmosphere.
3. Impose specific sulfur recovery efficiencies for SRUs:
 - a. based on whether or not the natural gas processing plant is existing or new and

- b. depending upon the magnitude of the sulfur released in plant processes. The required sulfur recovery efficiencies range from 88% for existing facilities (20.2.35.109 NMAC) to 98% for large (50 tons or greater sulfur released in plant processes) new facilities (20.2.35.110.C NMAC).

Required sulfur recovery efficiencies are generally written in the format, "...shall not permit, cause, suffer or allow *sulfur emissions to the atmosphere* (emphasis added) in excess of X pounds of sulfur for every 100 pounds of sulfur released in plant processes.

Applicability of 20.2.35 NMAC to Facilities or Parts Thereof, Utilizing Acid Gas Injection (AGI)

The purpose of AGI is to reinject all of the sulfur released in plant processes (acid gas) back into the geologic formation, with no "sulfur emissions to the atmosphere."

A review of the transcripts indicates that the Environmental Improvement Agency (EIA), the predecessor to the New Mexico Environment Department (NMED), did not intend for this regulation to apply to facilities that do not emit sulfur to the atmosphere. There was apparently one facility in New Mexico at the time that planned to reinject all of the sulfur released in plant processes back into the formation, likely doing so for enhanced oil recovery, with no sulfur emissions to the atmosphere.¹

The transcripts also explain what is meant by "sulfur released in plant processes," a definition that has also been a source of confusion over the years. A review of the transcripts indicates that the sulfur removed from field gas by a sweetening (amine) unit at a natural gas processing plant would be the "sulfur released in plant processes."²

The transcripts indicate that the regulation was intended to apply to natural gas processing plants, or parts thereof, that emit to the atmosphere (in quantities exceeding the thresholds discussed in items 1 and 2 above) some or all of the sulfur released in plant processes.¹

Although there is no specific exemption in the regulation, the discussion above supports the conclusion that AQCR 621 (20.2.35 NMAC) was not intended to apply to natural gas processing plants, or parts thereof, with no sulfur emissions to the atmosphere.

Even though there were no facilities at the time that were utilizing AGI as it is used today, this conclusion applies to facilities, or parts thereof, that utilize AGI as part of their normal operation. Periods of SSM & M are not considered normal operation. The reasoning supporting this statement will be addressed in the next section.

Therefore, 20.2.35 NMAC does not apply^{5, 6, 7} to natural gas processing plants, or parts thereof*, utilizing AGI.

**If a facility operates both a SRU and an AGI unit, 20.2.35 NMAC would apply to the SRU, but not to the AGI.*

Applicability of 20.2.35 NMAC to SRUs and AGIs during SSM & M

The transcripts also made reference to the upset or breakdown regulation that was in effect at the time, AQCR 801. Back then, upset and breakdown is what we refer to today as SSM & M, making AQCR 801 the predecessor of 20.2.7 NMAC. The discussion that ensued indicated that AQCR 621 did not apply during periods of upset, breakdown or scheduled maintenance (SSM & M) because SSM & M requirements were addressed by AQCR 801.³

Thus, AQCR 621 (20.2.35 NMAC) was never intended to and does not apply during periods of SSM & M.

Additionally, there are no provisions in 20.2.35 NMAC nor in its predecessor AQCR 621 that require the operation of a backup SRU during periods of SSM & M. It is clear that at that time the Agency expected that the provisions of AQCR 801 would address periods of SSM & M. Although AQCR 801 was revised in 1980 (as required by the EPA) to remove this categorical exemption, AQCR 621 was never revised to require the operation of a backup SRU during periods of SSM & M.⁴

This same logic would apply to periods of SSM & M to natural gas processing plants utilizing AGI. There are no provisions that would require the installation of a backup SRU or a redundant AGI while the AGI is down for periods of SSM & M.

In general, acid gas is routed to a flare during periods of SSM & M for facilities that utilize a SRU or AGI. Flares cannot reduce sulfur emissions to the atmosphere, they can only change the form of the sulfur by oxidizing H₂S to SO₂, adding further emphasis to the position that 20.2.35 NMAC does not apply to periods of SSM & M.

Therefore, the provisions of 20.2.35 NMAC do not apply^{5, 6, 7} during periods of SSM & M (flaring) to facilities that under normal operations would be operating a SRU or would be utilizing AGI.

Permits for Natural Gas Processing Plants that Utilize AGI

There are a handful of current natural gas processing plant permits that do not incorporate the current guidance. In light of the discussion above, these permits will be revised in future permitting actions in accordance with this guidance.

Disclaimer

This is intended to serve as general guidance and is in no way a formal statement of Department policy. Unique operating conditions may result in different determinations and may require a site specific analysis to accurately determine requirements and applicability. We will consider additional analyses of this guidance or analyses of unique situations for consideration by the Department.

APPENDIX

The testimony on the sulfur recovery requirements for Natural Gas Processing Plants for the Environmental Improvement Agency, the predecessor to the NMED, was provided by Mrs. Betty Perkins (footnotes 1-3 below). Please find below a brief summary of her qualifications.

“For the Agency, by Mr. McArthur: Hearing Officer: Mrs. Perkins, please be seated, state your name for the record and who you are employed by.

A I am Betty Perkins. I am on the Staff of the Environmental Improvement Agency.

Q. Mrs. Perkins, will you please give us your professional background?

A. My professional background includes employment at the General Electric gas turbine plant, it includes employment as a Staff Member for the Los Alamos Scientific Laboratory, it includes being a Staff Member at the Brookhaven National Laboratory and also a Staff Member at the Lawrence Radiation Laboratory. For the past several years, I have been employed by the Environmental Improvement Agency and I have testified before the Board on several occasions.

Q. Would you give your educational background?

A. I have a Bachelor's Degree from the College of Wooster and a Master's Degree from Radcliffe, with both of these degrees having majors in physics.

Q. Would you please discuss, for the Board, your testimony?

A. I would like to introduce into the record the paper that I wrote on oil refineries and natural gas processing plants and briefly go through that paper to point out where emissions to the atmosphere occur from the production and processing of petroleum products in New Mexico and what the controls available to prevent and reduce the emissions are, and then I would like to go through the regulations in more detail and specify what they mean in terms of cost and in terms of individual requirements in New Mexico.” [EIB Hearing number 73-11-08, pages 17-18]

The testimony on the stack height portion of the sulfur recovery regulation for Natural Gas Processing Plants (footnote 5 below) was provided by Mr. Bruce Nicholson. Please find below a brief summary of his qualifications.

“Mr. Nicholson: My name is Bruce Nicholson. I am an Environmental Engineer with the Air Quality Division of the Environmental Improvement Agency. I have been with the Air Quality Division for about three years. I am a registered professional engineer in the State of New Mexico. I have a bachelor's degree in engineering from Case Institute of Technology and a master's degree from Purdue University. Prior to this job, I was employed by Rocketdyne Division of Rockwell International for over two years and have had numerous job assignments in both industry and government while at college. My experience with the Agency has almost exclusively dealt with visibility effects and with meteorology and dispersion as it affects point sources, urban sources and transportation sources and I have developed several computer programs dealing with these areas. I have had E.P.A.'s course in Air Pollution Meteorology and FHWA's course in Dispersion from transportation sources and I have done independent research into micrometeorology and meteorology relating to terrain effects and mountain meteorology. I have presented testimony as an expert witness before this board on three separate occasions. The testimony which I will present today will deal with two items. First, I will discuss the proposed procedures in these regulations dealing with the determination of stack height; and second, I will discuss the pollution aspects of the current plants and the impact of the controls proposed here on the air environment.” [EIB Hearing number 73-11-08, pages 121-122]

Footnotes

1. “Mrs. Perkins: In Regulation 2, I guess we could have gotten a new record. Under 2A and B, they are interpreted by us, at least, to be as follows: If, in January 1, of 1976 a plant has processes which extract sulfur, say, from the incoming feed, which is not sent out then in the product, and of course you have to do something with the sulfur in the plant, if it has sulfur that could potentially be released to the atmosphere in excess of 10 pounds, then you come under Sections A and B. Our interpretation of release would be that if you didn't control your sulfur, it would have to be released to the atmosphere and by released-in-plant processes, we mean taken out of the material that you are processing. ... I might state just what plants might be affected by Sections A and B.
We have a plant at Artesia which might be affected, but I understand that that plant will take any sulfur that is not recovered and inject it back into the formation. This is our information at the present so that sulfur would not be released to the atmosphere. We have a plant at Hobbs that has a sulfur recovery unit, but it does not treat all the gases and that unit would have to have either a new, fairly large Claus unit or it would have to go with a small unit. The operators of this plant have told me that they are considering both and they intend to comply with our regulations.” [EIB Hearing number 73-11-08, pages 51-52]
2. “No one plant in New Mexico processes their gas exactly like any other plant, but it would be expected that burning of sour fuel and the H₂S that is released overhead in the gas sweetening system would be the major point of sulfur release from the plant. This is what we mean by "released-in-plant process." [EIB Hearing number 73-11-08, pages 39-40]
Note - At the time, the definition included the burning of sour gas as fuel. The advent of more modern air regulations has eliminated this practice.
3. In answering a question about AQCR 623, Mercaptan (now incorporated into 20.2.37 NMAC), Mrs. Perkins made reference to an upset or breakdown regulation which was expanded upon by Mr. David MacArthur. In clarifying Mrs. Perkins comment, Mr. MacArthur responded as follows;
“Are you aware of our Regulation 801, upset and breakdown where we provide that air quality regulations do not apply where you are in either an upset situation or breakdown or scheduled maintenance”?
The original version of AQCR 801 (now 20.2.7 NMAC), filed on January 27, 1970, had the following provision (reproduced in relevant part), “Operation of any equipmentto cause emissions of air contaminants in excess of limits set by these regulations which is a direct result of upset conditions or breakdown orshutdown of such equipmentfor scheduled maintenance, is not a violation of these regulations” [EIB Hearing number 73-11-08, page 120]
4. The revision of AQCR 801 in 1980 allowed the Agency to use an “Enforcement Discretion” approach to periods of SSM & M, meaning that each event would be evaluated on the merits of the specific case to determine whether or not to seek penalties. However, this does not (and never did) apply to injunctive relief. This means that if a particular facility appeared to exhibit a pattern of excess emissions so frequent that it could be construed to be normal operation, the Agency could assert that 20.2.35 NMAC does in fact apply and require the installation of a SRU as injunctive relief.
5. The discussion in footnote 1 above makes it clear that the sulfur recovery requirements of 20.2.35.109 & 110 NMAC do not apply to facilities, or parts thereof, utilizing AGI. The discussion in footnote 3 above clarifies that these requirements do not apply during periods of SSM & M. A review of the transcripts clarify that the stack height requirements of 20.2.35.111 NMAC also do not apply. The testimony in the transcripts reveal that the stack height requirements were intended

to justify the need for control (i.e.; the installation of SRUs), as well as to require increased stack heights for existing facilities that were flaring all of their acid gas (i.e.; existing facilities that were flaring less than 7.5 tons per day) as part of their normal operation. Neither of these scenarios would qualify as SSM & M. We have already asserted that the regulation does not apply during periods of SSM & M.

Please find below the portions of Mr. Nicholson's testimony (reproduced in relevant part) regarding the need for control and increased stack heights:

"Mr. Nicholson: Natural gas processing plants are generally different in physical layout and in the amounts of gas processing and other parameters which affect the expected ground level concentrations. When controls are installed, the amounts of off gas released will be different from plant to plant

...The Board should probably keep this point in mind when considering the levels of control proposed and the methods set forth for stack height determination.

...The plant that I have picked is the El Paso-Eunice Plant. Generally this plant is located near Hobbs. It emits in the neighborhood of 50 tons per day of SO₂ from a 105 foot flare stack.

...These figures vividly show the need for control. The worst case 24 hour value under neutral conditions (D stability) of 1.7 ppm shows that a 92% sulfur reduction would be required for compliance with the federal primary standard of 0.14 ppm. Higher levels of control would be necessary to meet 0.10 ppm however a combination of 88% control plus stack height would suffice. Most plants which emit 7.5 tons per day or less of sulfur have stacks shorter than 105 feet. Clearly, these plants will have to modify their existing stacks in order to prevent excessive ground level concentrations." [EIB Hearing number 73-11-08, pages 124-129]

6. There is some discussion in the transcripts that specifically address the requirements of 20.2.35.112 NMAC (AQCR 621.L, Section K in the proposed regulation).

"Section K is simply a section to help the Department to determine what plants would come under the regulations, and to what extent the plants were in compliance." [EIB Hearing number 73-11-08, page 57]

Based on the above, it could be argued that all facilities would be subject to the requirements of 20.2.35.112.1-3 NMAC, because these sections require facilities to determine the amount of sulfur released in plant processes. The requirements of 20.2.35.112.4-5 NMAC apply specifically to SRUs.

We have already asserted that facilities or parts thereof utilizing AGI are not be subject to the requirements of 20.2.35.109 & 110 NMAC because they do not emit sulfur to the atmosphere. Accordingly, there would be no need for these facilities to determine the amount of sulfur released in plant processes because we already know that they are not subject to the regulations.

Facilities that flare all of their acid gas as part of their normal operations (i.e.; release less than 7.5 ton per day for existing facilities and 5 tons per day for new facilities) are subject to the requirements of 20.2.35.112.1-3 NMAC. However, as discussed previously, this section would not apply to facilities, or parts thereof that flare all of their acid gas during periods of permitted SSM & M that normally operate SRUs or AGIs.

7. The provisions of 20.2.35.113 NMAC are no longer applicable. Facilities were required to apply to the EIA for certification as a "Declining Emission Natural Gas Processing Plant" by no later than January 1, 1975. If the certification was approved by the EIA, these plants were to decrease sulfur emissions to the atmosphere to less than 7.5 tons per day by January 1, 1980. To my knowledge, there are no "Declining Emission Natural Gas Processing Plants" in New Mexico.